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.

[TANGANYIKA] Annual Report of the Tanganyika Medical Department for 1957, Vol. 3. Dar-Es-Salaam, Government Printer, 1958.

During the year the outpatient treatment facilities have been expanded. Five leprosaria are maintained by the government, and 14 by missions and native authorities. The Chazi leprosarium, a government institution in Eastern Province, has been developed considerably. It continued to be administered by a Belra worker with medical supervision from Morogoro. [Since the year ended, however, a medical leprologist has been stationed there.] In Southern Province there are 3 Belra workers, 2 of them engaged in outpatient work. The Makete leprosarium in South Highlands Province, with an average of 725 resident patients (930 admitted during the year), is the focal point of an extensive outpatient clinic organization attended during the year by 1,300 patients. In Western Province the leprosarium at Sikonge is run by the Moravian mission on behalf of the native authorities, an arrangement which has worked very well. In Tabora District [the same area] the native authorities are accepting responsibility for outpatient treatment. The total numbers of patients were 4,965 resident and over 18,000 attending the clinics. There are no signs of increased incidence although increased facilities have brought more cases under treatment. —JOHN GARROD

[KENYA] Medical Department, Annual Report, 1957. Nairobi, 1958, 38 pp.

The following is all that is said about leprosy. "Intensive surveys have been carried out in the Nyanza Province revealing an overall rate of rather less than 10 cases per 1,000 of whom approximately 10 per cent are lepromatous. This gives an estimated total of approximately 20,000 for the province, of whom 2,000 will be infectious. This is a considerable reduction on previously estimated figures. The difficulty still remains, however, to persuade patients to attend clinics regularly and for a prolonged period for treatment. There is a singular lack of understanding by the people in this province of the infectious nature of leprosy. In these circumstances, health education of the public is of paramount importance." Nothing is said of leprosaria, or of the East African Leprosy Research Centre. Leprosy does not appear in the list of "main infectious diseases" reported. Other tables indicate that there were 218 leprosy inpatients and 1,072 outpatients. —H. W. W.

[PHILIPPINES] Department of Health, Republic of the Philippines. Annual report 1956-1957, Manila, 48 pp.

At the time of this report, before a reorganization plan was made effective, the leprosy service (Division of Sanitaria) was a part of the Bureau of Hospitals. (It is now part of a new entity, the Bureau of Disease Control, of which Dr. José N. Rodriguez —formerly the head of the Division of Sanitaria—is director.) There are 8 sanitaria, as follows: Central Luzon (Tala, Rizal, 2,155 patients); Culion (Palawan, 2,031 patients);

Eversley Childs (Cebu, 1,131 patients); Western Visayas (Santa Barbara, Iloilo, 664); Bicol (Sipocot, Camarines Sur, 386 patients); Mindanao Central (Zamboanga, Zamboanga del Sur, 330 patients); Sulu (Jolo, 128 patients); and Cotabato (Cotabato, Mindanao, by difference 136 patients); total in institutions, 6,961; number released or discharged during the year, 619. Under the control of the Leprosy Research and Training Center in Manila there are three stationary and five traveling clinics primarily for detecting early cases, the latter activity being aided by UNICEF. A total of 2,431 new cases were found, 57% of which were bacteriologically negative. —H. W. W.

[Queensland] Annual Report of the Health and Medical Services of the State of Queensland for the Year 1957-58. Brisbane, 1958, 121 pp.

A main tabulation shows that 1 case of leprosy ("Hansen's disease") occurred in the metropolitan area and 6 in the extra-metropolitan area. At Peel Island, with admissions (3 new and 1 readmitted) balancing discharges, 1 death reduced the population from 20 to 19, of which only 14 were active cases. At the Fantome Island leprosarium for aborigenes there were 5 admissions, all new, bringing the total remaining to 26 against 24 a year previously. Leprosy, "once a fairly serious problem in aboriginals, who are racially susceptible, is no longer a hazard in this State . . ." —H. W. W.

[Hind Kusht Nivaran Sangh]. Annual report, 1957. New Delhi, 1958, 68 pp.

As usual, this report of the Indian Leprosy Association gives a general account of leprosy work in India not to be found elsewhere. The introductory report of the chairman (Rajkumari Amrit Kaur) ranges widely, and includes statements about the plans and operations of the government itself, of the Mission to Lepers, and of the Belgian Leprosy Centre in Madras. The highlights of research that are mentioned are studies of the bacillus by electron and phase microscopy, in Calcutta; clinical and histologic studies of the lepromin reaction, and epidemiological studies, in Bombay; and studies of deformities and their prevention, at Vellore. Part II tells of the work of the Leprosy Department, School of Tropical Medicine, Calcutta. This includes a brief account of the earlier phases of transmission work with hamsters and hybrid black mice, at which time (injections as yet only intraperitoneal) only the hamsters had shown encouraging results (contrary to later developments). Part III is financial, from which it is learned that the Sangh has a technical adviser; and Part IV contains reports of state branches of the Sangh. —H. W. W.

Wardekar, R. V. Leprosy control work of the Gandhi Smarak Nidhi. Leprosy in India **30** (1958) 97-101.

In this avowedly general report it is stated that in the area covered by the Foundation's nine operating control units, the population of which is 192,835, the prevalence varies from 8 to 37 per thousand, with an average of 19.1 per thousand of persons examined. A total of 4,704 cases had been detected (12% lepromatous), and a majority of them were taking treatment. Also, 11,500 patients from outside areas attend the clinics. Although there are many difficulties in securing medical men for leprosy work, the Foundation has been fortunate; the only difficulty has been in getting a doctor speaking a particular language. Initial surveys take about two years. Second and third surveys are smooth, but with the fourth one the people get tired of repeated examinations. Attendance of the patients depends on the influence of workers, the psychology of the patient, and the prejudices of the people. Generally speaking, a majority of the patients take treatment, exceptions being some cases with early lesions and some with advanced lepromatous lesions.—[From abstract.]

Mullick, D. K., Sen, S. C. and Sen, P. The Bankura rural leprosy investigating centre. An overall epidemiological report for the period between 1937-1956. Leprosy in India **29** (1957) 87-97.

The work of this investigation center in West Bengal extends for 20 years, from 1936 to 1956. The population in 1937 was 10,000, with 424 cases of leprosy (4.2%); in 1956 the population was 10,719, with 526 cases (4.9%). The number of lepromatous cases had increased from 96 to 105, although 79.3% of the original lepromatous patients had died. Thus, during this period the disease has increased, as has also the proportion of lepromatous cases. This has occurred in spite of the fact that there has been no famine in the last 12 years, but rather the area has been one of surplus. Previous to that there was severe famine and many leprosy patients died, to be succeeded after the famine by new cases. (Nothing is said of treatment in this area, but in two new neighboring areas with populations respectively of 24,000 and 20,000 there is intensive study and treatment.)—[From abstract in *Trop. Dis. Bull.* **55** (1958) 1333.]

HEMERIJCKX, F. The Belgian Leprosy Centre, Polambakkam. Leprosy in India **30** (1958) 24 (abstract only).

The center was started in July 1955 with the aid of the Belgian Foundation, it being agreed that after 5 years it shall be handed over to the Government of India. It is located at the same place in the south of the Chingleput district where a night segregation center was started by Cochrane in 1939. Segregation of all infective cases being impracticable, mass treatment of all cases is advocated. The idea is to treat early cases so that they may not become infective or develop deformities; to treat deformities if already present and to prevent further deformities; to hospitalize infective cases and cases with complications; to treat infective cases in their own homes when institutional treatment cannot be arranged; to educate the infective patients and their relatives about the danger of contact; and to prevent further spread of infection by home isolation of infective cases and also by preventive BCG vaccination. Other objects of the center are to start physiotherapy, orthopedic surgery, and social rehabilitation of patients. The staff includes 2 European doctors, 2 European nurses, and 38 Indian workers trained at the center. A number of clinics, some of them under trees, were established within a short time to give every patient the immediate benefit of modern treatment, and more than 3,000 were brought under treatment within the first 6 weeks, most of them receive DDS. Acute cases are admitted to the hospital. During the last 2½ years, 19,767 patients were treated. The difficulties experienced are irregularity of attendance of patients, and nonavailability of a type of worker who can impress upon the patients the need for regular treatment and persuade infective cases to submit to home isolation. Along with the treatment work three types of surveys are done: (*a*) survey of contacts of all patients, (*b*) intensive survey of 2 or 3 villages near each clinic area, and (*c*) survey of the rest of the area, which will take several years.—[From abstract.]

MERCADANTE, F. F. AND CAPURRO, E. T. Valoración de las comunicaciones sobre enfermos de mal de Hansen recibidas en los últimos once semestres, por la Dirección de Lucha Antileprosa. [Value of the information on leprosy patients received during the last 5½ years by the office of the antileprosy campaign.] Leprología **1** (1956) 174-178.

This statistical report comprises a study of the proportions of the clinical forms of leprosy in the cases reported to the office of the antileprosy campaign in the period between January 1, 1950, and June 30, 1955, based on tables of data distributed according to provinces, sex and geographic areas. In Argentina as a whole the lepromatous forms predominate over the tuberculoid, although in some provinces there is a predominance of mild forms which reverses the situation. As regards areas, the littoral, formerly known as having the greatest leprosy morbidity, shows a predominance of lepromatous cases, whereas in the inland country (mediterránean) the tuberculoid form definitely has first place. Considering the probable margin of error in the figures given, the authors stress the necessity of improving the reports submitted, for the good of the antileprosy campaign.—[Authors' summary, supplied by G. Basombrio.]

NADEL, B. Missionsärztliche Erfahrungen eines Dermatologen in Westafrika. [Experiences of a dermatologist in the missionary service in West Africa.] Ztschr. Haut- u. Geschl.-krkh. **24** (1958) 12.

In Nigeria, the author and 5 other physicians, 24 nurses and about 50 male native attendants had 24,000 leprosy patients under their care. These were treated in 7 clinics in an area of about 20 km. around. The patients were grouped according to tribe and religion. They lived in the colony together with their families and were occupied with agricultural work. About 1,500 patients were treated each day, and there were 30-50 new admissions. It is estimated that 8-10% of the population are affected with the disease. At the first signs of leprosy the sick are expelled from the community, but members of the family regularly bring food to near their dwelling place. It is attempted to collect these leprosy patients regularly from their self-built, primitive shelters and to conduct them to regular treatment and proper care.—E. KEIL

FERNANDEZ, J. M. M. B.C.G. en la profilaxis de la lepra; plan de campaña en la Argentina. [BCG in the prophylaxis of leprosy; plan for the campaign in Argentina.] Leprología **1** (1956) 122-127.

The fundamentals of the use of BCG in leprosy prophylaxis are discussed. For Argentina, a vaccination program is proposed which would reach all the people in the endemic areas. In this experiment contacts would be divided into two large groups, those who have received intradermal injections of lepromin and those who have not. Only half of each group would be vaccinated with BCG. As regards dosage and other matters, a committee of the Sociedad argentina de Leprologia should serve in an advisory capacity.—[From author's summary, supplied by G. Basombrio.]

BOSQ, P. El médico "ambulante" como elemento de lucha antileprosa. [The traveling physician as an element in the antileprosy campaign.] Leprología **1** (1956) 179-182.

Even when there exists a sufficient number of dispensaries, yet in extensive areas there are always people who live far away from these centers. A specialist practitioner who visits leprosy patients in their own homes, by arrangement with a social worker or by request of the local physician, to advise regarding proper treatment and measures of prophylaxis, can render a great service to the patient himself and to the antileprosy campaign. This article is the fruit of the experience of the author in the province of Corrientes, which has one of the highest prevalence rates in Argentina.—G. BASOMBRIO

SANCHEZ CABALLERO, H., CAPURRO, E. T. AND ARAMBURU, N. Profilaxis de la lepra. [Prophylaxis of leprosy.] Orientación Méd. **6** (1957) 1120-1123.

This is a brief discussion of the modern trends of leprosy control measures. The promising changes in the field of therapy are pointed out, and the constant efforts to raise the level of care of patients. The authors agree with those leprologists who hold that to abandon, suddenly and definitively, the isolation of open forms of leprosy might have harmful effects. They believe that the isolation measure may now yield benefits not achieved before the sulfone era, especially if it is complemented with dynamic dispensary activity for the detection of early cases.—[From authors' summary, supplied by G. Basombrio.]

DHARMENDRA. The role of chemotherapy in the control of leprosy. Leprosy in India **30** (1958) 9 (abstract only).

The difficulties controlling the spread of leprosy, which until recently made the situation seem a desperate one, has changed for the better with the developments in chemotherapy. By reducing the infectivity of the patients, treatment with the

modern drugs is likely to contribute importantly to control. However, the drugs must be applied extensively, to all of the cases in the area; otherwise the untreated cases will continue to spread the disease. Although very promising this approach has several limitations, and the preventive role of the drugs has yet to be proved. Apart from the long time required for bacteriological clearance, there is the big problem of giving regular treatment to all the cases in an area. Experience has shown that even under favorable circumstances only about 60-70% of the patients registered for treatment take it with any degree of regularity, and under unfavorable circumstances the figures are much lower. Chemotherapy should not be considered as an exclusive control method, making it possible to dispense completely with isolation of infective cases. In countries where there are adequate accommodations, chemotherapy provides a supplementary method which permits relaxation of the rigors of isolation, thereby lessening the tendency to concealment. In countries where the hugeness of the problem is coupled with limited inpatient accommodations, chemotherapy provides a practical alternative approach, and enables a better use of the available inpatient accommodations by making possible a quick turnover of the patients. The possibility that these drugs may play a role in prophylaxis in another manner, by preventive treatment of healthy contacts, is worthy of investigation, but until that is done the routine use of the drugs in healthy contacts cannot be advocated.—[From abstract.]

MUKHERJEE, N. Role of chemotherapy in the control of leprosy. Leprosy in India **30** (1958) 10 (abstract only).

Discussing the program of control by chemotherapy which has been adopted in some countries—in India by the Gandhi Memorial Leprosy Foundation since 1951—the author states that the expectation that the prevalence of the disease may be reduced by this method is as yet hypothetical, since no concrete proof has so far been obtained from anywhere, and it is not likely to be obtained in the near future as no tangible result may be expected in a short time. However, a report from Nigeria is cited as "a hopeful sign." The success or failure of either isolation or chemotherapy in control depends on early application of the measure. In that connection regular follow-up of contacts is very important. It is not justifiable in the present state of things to depend upon chemotherapy alone, abandoning isolation. Even if all patients are found their cooperation is necessary, and that calls for a suitable educational campaign. Greater public consciousness and a sense of responsibility on the part of the patients and their relatives are of utmost importance in any campaign directed against a contagious disease.—[From abstract.]

BASOMBRIO, G., CARDAMA, J. E. AND GATTI, J. C. Contagio conyugal de la lepra en nuestra casuística. [Conjugal infection in leprosy among our cases.] Leprología **1** (1956) 141-142.

This report concerns a new series of 272 married couples, among whom 12 instances of conjugal infections were found (4.4%). The infecting partner was in all instances a bacteriologically-positive lepromatous case. Of the infected spouses, 7 were women and 5 men; 8 were tuberculoid, 3 were indeterminate, and 1 was lepromatous. The tuberculosis factor is considered to be the possible cause of the high percentage of the tuberculoid forms among the infected partners.—AUTHORS' ABSTRACT

OGATA, K. Energy Metabolism and Temperature Regulation in Leprosy. Bull. Res. Inst. Diathetic Med., Kumamoto Univ. **7** (1957) Monogr. Suppl., March 10, 45 pp.

The object of this monograph is "to make inquiries into the *milieu interior* of leprosy patients as observed from a physiological standpoint of body temperature regulation." In examining the mechanism of heat production at the national leproserium at Kumamoto it was found that basal metabolism rose by 8% from the average

in the winter and fell by 9% in the summer, a difference of 17% as compared with 10% in average Japanese, with no difference between the lepromatous and neural types. In erythema nodosum leprosum there is a marked rise in basal metabolism and a remarkable fall in the respiratory quotient, suggesting difficulties in the intermediate metabolic process. Next is considered the mechanism of body heat elimination. With the spreading of skin lesions the sweat function is damaged, and there is compensatory increased sweating in the unaffected skin areas, but this hyper-function is also observed in mild cases where the patient's affected area is so slight that no compensation is necessary. The effects of adrenalin and of nicotine injection on the sweat function are discussed. It was found that some patients who had an impediment in sweating and were suffering from heat congestion were secreting large amounts of saliva, and that proportionate to the increase of saliva there was a decrease in its chlorine content. In the hot weather the skin temperature of leprosy patients, whatever the type, does not differ from that of healthy people. In cold weather the temperature of the neural-type patient does not differ from normal; in the lepromatous patient the vasomotor regulation does not work until the environmental temperature goes down below 20°C. The third chapter considers the problems of body temperature regulation. Normally, regulation is controlled chiefly by the skin, but in leprosy "it is not reasonable to put the chief responsibility . . . upon the thermal sensation of the skin alone." It is suggested that in lepromatous cases there are changes in the chemical constituents of the body fluids which greatly influence body temperature regulation. Considering carbohydrate and protein metabolism, it is said that the fasting blood sugar level is lower in lepromatous than in neural leprosy, especially in patients with a tendency to erythema nodosum. Lastly, the author describes an experiment in which a healthy man and a patient with severe neural leprosy were placed in a hot environment long enough to become congested with heat. "An intake of 200 cc. of ice water produced no effect on the metabolism in the healthy man, while in the patient it resulted in a marked depression." This proves increased sensitivity of the digestive tract in leprosy patients, and "presumably of the internal organs in general."—[From abstract in *Trop. Dis. Bull.* **55** (1958) 1334.]

Rodriguez, O. Lepra de Lucio. [The leprosy of Lucio.] Rev. Med. Estud. Gen. Navarra **2** (1958) 304-311.

The author summarizes the clinical concept of the Lucio variety of lepromatous leprosy, first described by Lucio and Alvarado in 1852 under the title "Lepromatosis Difusa Pura y Primitiva." For 90 years this "spotted," or "lazarine" leprosy was neglected, until redescribed by Latapí in 1937. Basically, it arises in a diffuse, generalized infiltration which never develops into nodules. Another typical feature is a special form of lepra reaction, characterized by a multiple necrozing angiitis, the Lucio phenomenon. The disease begins with anhydrosis and numbness, and formication of the hands and feet. The skin is completely smooth and of a pink color. Slowly there develops alopecia of the eyebrows, eyelashes and elsewhere; in rare cases there is alopecia of the scalp. Two or three years later there appear the spots or macules, always painful, at first a vivid red, quickly darkening to become ash-colored. At first they are more numerous on the lower limbs, later they affect the upper limbs, and in the latest period they appear on the face and the trunk. Each macule has an acute phase of about 15 days, later undergoing a central necrosis which looks like a tiny blister. Last of all there is formed a crust of dark red color, very thin, apparently made up only of the epidermis. This crust falls off in a few days and leaves a superficial, whitish scar surrounded by a narrow hyperpigmented zone. Sometimes, and especially on the lower limbs, the lesion may take the form of a blister, usually dark and flaccid, which on bursting reveals an ulceration. Concommitant conditions do not include eye trouble. The prognosis is not good; the whole syndrome can last 6-8 years. Bacilli are abundant in the lesions and in the nasal mucosa. The lepromin reaction is

always negative, but has the peculiarity of showing a miniature Lucio phenomenon 4-6 hours after injection of the antigen (the phenomenon of Medina). Study of the histopathology reveals the lepromatous structure of the diffuse infiltration to be of a special type; there are discrete epithelial-cell infiltrations and new formation of vessels in the dermis, with perivascular infiltration of Virchow cells. Dilatation and necrosis of capillaries is the chief change in the Lucio phenomenon, which promotes frank vascular necrosis. These patients respond to sulfone treatment better than the ordinary nodular cases, especially if the dosage is small (25 mgm. daily, or less) and slowly induced. Lucio leprosy is particularly frequent in the northwest part of Mexico, where there is a focus in a zone known as "Los Canales." It has also been observed in certain other countries in recent years, especially Costa Rica.—J. Ross Innes

Murata, M. Ueber erythema nodusum leprosum. Japanische Zeitschr. Dermatol. Urol. **12** (1912) 1013; *reprinted, translated, in* Leprosy Rev. **29** (1958) 117-118.

This pertains to a historical piece, from the article in which the term "erythema nodusum leprosum" is supposed to have been used for the first time. The summary was obtained from Y. Hayashi, of Tokyo, by W. H. Jopling, who submitted it to *Leprosy Review* where it was reprinted after some condensation and editing.—H. W. W.

Melamed, A. J. Patogenia de la "lepra reacción" lepromatosa; aporte experimental. [Pathogenesis of the lepromatous lepra reaction; experimental contribution.] Leprología **1** (1956) 167-173.

Lepromatous lepra reaction is a manifestation of sensitivity of the lepromatous tissue which, because of its characteristics, belongs to the group called "fixed vascular reactions of late appearance," which also includes periarteritis nodosa. The lepromatous tissue in the process of being "conditioned," or being prepared to react, finds itself in state of critical equilibrium with respect to cortisone, similar steroids, or equivalent conditions. This circumstance permits us to understand that all factors which are likely to increase the consumption of cortisone (stress) can likewise provoke or aggravate the lepra reaction. These conclusions lead to the suggestion that the treatment of lepra reaction should preferably be preventive, directed toward the cause (removal of the factors of stress), and protective of the lepromatous tissue (effector or shock organ) by means of small and continuous doses of glucocorticoids or other drugs of similar action.—[From author's conclusions, supplied by G. Basombrio.]

Binford, C. H. Leprosy as a diagnostic problem in surgical pathology. Southern Med. J. **51** (1958) 200-207.

This paper is directed to pathologists who should be aware of the possibility that biopsy specimens from clinically undiagnosed leprosy cases may come to them for histological diagnosis. Six cases are presented in each of which one or more surgical pathologists failed to make the diagnosis. One of them would be difficult to recognize almost anywhere, for it was a Lucio case; the patient had been in open hospitals for nearly four years before his condition was diagnosed. Swan, in discussion, deplored the tendency to play down the infectiousness of leprosy, citing figures of Badger which show that with regard to infection of family contacts leprosy is not far behind tuberculosis.—H. W. W.

Reyes-Javier, P. D. and Rodriguez, J. N. Granuloma annulare simulating tuberculoid leprosy. J. Philippine Med. Assoc. **35** (1959) 242-248.

Granuloma annulare being relatively rare, the authors describe the condition and then relate the case histories of two patients for whose condition the diagnosis of tuberculoid leprosy was at first entertained. Anesthesia to pinprick in the lesions was one of the reasons for that original diagnosis. (Two clinical pictures of lesions and two photomicrographs are so poorly reproduced as to be useless.)—H. W. W.

MASANTI, J. G. AND JONQUIERES, E. D. L. Evolución a la lepromatosis de un paciente tuberculoide reaccional supuestamente curado. [Transformation to lepromatous of a presumably cured reactional tuberculoid patient.] Leprología **1** (1956) 183-190.

A typical reactional tuberculoid patient in the Sanatorio Baldomero Somner was discharged from the leprosarium, free of lesions, after a year of chaulmoogra treatment [this being in 1942-43]. The diagnosis was supported by clinical, histopathologic and immunologic findings. The examinations for bacilli were always negative, and the Mitsuda reaction remained 2+ positive during the course of the disease and at the time of discharge. The patient did not go to the dispensary to continue treatment. Eleven years later he reentered the leprosarium, then with advanced (L_3) lepromatous leprosy, bacteriologically positive and lepromin negative. This is an undoubted case of transformation from one polar type to the other.—[From authors' summary, supplied by G. Basombrio.]

LECHAT, M. AND CHARDOME, J. Évolution radiologique des mutilations chez des lépreux traités par la D.D.S. [Radiologic evolution of mutilations in leprosy patients under treatment with DDS.] Ann. Soc. belge Méd. trop. **37** (1957) 907-918.

Out of 128 leprosy patients available for a second radiologic examination, all but 10 showed lesions of the bones of the extremities. All the patients had been on treatment with DDS for 2 to 6 years before the first examination. The examinations were made at intervals of 17 to 29 months. Mention is made of 9 bone changes in the hands, and 16 in the feet, including among others: resorption of the distal phalanges, flattening of the joint sockets with subluxation of the first phalanx, concentric atrophy of the phalanx, fracture resulting from atrophy, telescopic shortening at the metatarsophalangeal joint, resorption of the metatarsus, arthrosis, synostosis. It is concluded that, although treatment may prevent mutilations where they have not already begun, it does not to the same extent prevent the progress of mutilations which have begun before the initiation of treatment. On this account it is all-important that treatment should be begun early.—[From abstract in *Trop. Dis. Bull.* **55** (1958) 900.]

JONQUIERES, E. D. L. Meralgia parestésica (síndrome de Bernhardt-Roth). [Meralgia paresthetica (Bernhardt-Roth syndrome).] Rev. argentina Dermatosif. **41** (1957) 249-252.

Presented are 4 cases of meralgia paresthetica of the cutaneous femoral nerve, all occurring in the external surface of the right thigh, 3 of whom exhibited an incomplete histamin reaction in the affected area (positive Pierini). Two of the latter patients, because of their having resided for many years in a leprosy endemic area, raised the question of etiology underlying the result of the histamin test. However, the patients have been observed for 10 years and have not exhibited leprosy manifestations, which seems to rule out that possible etiology. The fourth patient was the only one in whom the etiology was clear, for he had an immediate past history of an injection in the affected site.—[From the authors' summary.]

BERGEL, M. Mecanismo de la actividad antileprótica de las sulfonas. [Mechanism of action of the sulfones.] Leprología **1** (1956) 156-166; *also* Semana Méd. **111** (1957) 164-171.

The classification and pharmacology of the antileprosy sulfones are reviewed, and experiments which show the *in vitro* and *in vivo* antioxidant activity of the parent sulfone are described. The author interprets the mechanism of action of the sulfones against leprosy on the basis of an antioxidant activity conferred by the amino groups which stabilize the fats of the organism. The differences between the sulfonamides and the sulfones as regards their mechanisms of antibacterial action are discussed.—[From the author's summary, supplied by G. Basombrio.]

LAVIRON, P., BEYTOUT, D. AND JARDIN, C. Traitement synergétique de la maladie de Hansen par de faibles doses de sulfone-mère, de thioacétazone et d'huile de chaulmoogra en injections hebdomadaires. Premiers résultats. Note préliminaire. [Synergic treatment of leprosy with small doses of DDS, thioacetazone and chaulmoogra oil, given in weekly injections. First results. Preliminary report.] Maroc Méd. **37** (1958) 668-670.

It is important that the dose of each of the three components should be small in order to avoid reactions, and yet large enough to be effective. The suspension contains 30 gm. each of crystallized thioacetazone and DDS, in 560 cc. of chaulmoogra with 4% guiacol. [This is set out in the paper as "chaulmoograte d'éthyle: gaiacolé. H. de chaulmoogra: a 4%: 560 ml." Laviron is known to favor a 50:50 mixture of the ethyl esters and the oil for an injection vehicle.] The preparation is sterilized for three successive days at 70°C.; autoclaving is liable to make the suspension painful on injection. Patients with long-standing disease were at once given the weekly dose of 6 cc. [about 53 mgm. of DDS], while new patients were given successively 2, 4 and 6 cc. in a rising scale. Results were evaluated after 6 months. All of 28 lepromatous patients showed improvement, marked in 6. All but 1 of 25 tuberculoid patients showed improvement, marked in 12. Out of 7 patients with the undifferentiated type 3 showed marked, and 2 slight, improvement, while 2 remained stationary. Comparison with the various forms of treatment used in the previous year showed better results as regards both the degree and the number of improvements. There is thus evidence of synergic action, and the experiment is considered interesting and worthy of further trial.—[From abstract in *Trop. Dis. Bull.* **56** (1959) 54.]

BOSE, D. N. Treatment of leprosy with reference to its reacting conditions. Leprosy in India **30** (1958) 17 (abstract only).

The therapeutic value of the sulfones in the treatment of all active and progressive cases of leprosy—particularly of the tuberculoid and lepromatous types—is well established. Sulfone-resistant or -intolerant cases may be treated with thiosemicarbazone (which is also helpful in nonlepromatous cases in place of sulfones); thiosemicarbazone may be administered for about a year, then sulfone treatment can be reverted to if necessary. The sulfones are not so satisfactory in the maculoanesthetic and polyneuritic cases, for which the author uses hydnocarpus oil and its derivatives in combination with sulfone with good results. In the management of lepra reaction caution is to be used against injudicious administration of antimony, which should not be pushed in cases with any signs or previous history of pleurisy or tuberculosis. The value of Irgapyrin and Unalgen in the management of lepra reaction associated with severe joint pains, nerve pain, and fever is stressed. Reaction in tuberculoid cases may be successfully treated by intramuscular injection of streptomycin every other day. The effect of corticosteroid therapy in the treatment of refractory reacting conditions in leprosy patients is discussed in detail.—[From abstract.]

PANJA, G. Pathogenesis and treatment of hypopigmented lesions of leprosy. Indian J. Dermat. **3** (1958) 150-151.

Depigmented skin patches in leprosy are considered to be due to affection by lepra bacilli in the skin of the sympathetic nerve fibers which control pigment and sweat functions. Anhidrosis is due to the same cause; thus local injection of pilocarpine causes scanty sweating in the affected patch, and more profuse sweating in the surrounding skin. The treatment recommended is, in addition to sulfone therapy, careful intradermal infiltration of the hypopigmented area with hydnocarpus oil with creosote. This causes a local reaction followed by return of pigmentation and sweating.—[From abstract in *Trop. Dis. Bull.* **56** (1959) 54.]

Terencio de Las Aguas, J. La prednisona en las fases agudas de la lepra. [Prednisone in the acute phases of leprosy.] Rev. Leprol. Fontilles **4** (1957) 203-212.

The author first discusses the causes of lepra reaction in relation to the syndrome of adaptation of Selye. He believes that lepra reaction acts as "stress" on the constitution of the leprous patient, giving a general syndrome of adaptation with a first phase of alarm and discharge of corticotropin, which sets free the reserves of suprarenal hormones. In a second phase the adrenal secretion liberated overcomes the reaction. In a third phase the adrenal cortical reserves become used up and the patient then reaches a condition of continuous reaction. Cortisone and corticotropin have the power to correct, heal and suppress all the disorders connected with the general syndrome of adaptation, although excessive dosage or want of proper control may produce grave phenomena and even fatal complications. The author then recounts his experience with prednisone, which is 3 to 5 times as powerful as cortisone, can be used in many conditions where cortisone is contraindicated, does not require the same strict regulation of diet, and is less toxic and safer. Of the 5 mgm. tablets of the drug, 3 or 4 were given for 2 days, 2 or 1½ for 2 days, 1 or ½ for 3 days, and then 1 once a week. Of the 11 patients treated, 8 had general lepra reaction, 2 had joint and bone reaction, and 1 had severe inflammation of testis and epididymis. In all these patients there was relief of inflammation within a few hours, followed by fall of temperature, rapid clearing up of local symptoms, and complete restoration of well-being within a few days. Tolerance was "magnificent" and there were no complications.—[From abstract in *Trop. Dis. Bull.* **55** (1958) 1022.]

Smith, R. S. and Alexander, S. Heinz-body anaemia due to dapsone. British Med. J. **1** (1959) 625-627.

This report is of the finding of Heinz bodies in the erythrocytes of patients with dermatitis herpetiformis under treatment with DDS. This drug has proved of value in that condition, although because of the required dosage anemia is a hazard. The authors consider search for these bodies useful in early recognition of the anemic state, and they give briefly two methods for demonstrating them. (1) A few drops of blood are mixed with about double their volume of 0.5% methyl violet in isotonic saline (the solution to be filtered before use). After standing for a few minutes, a drop is examined under a coverslip with the oil-immersion objective. (2) To make *Method II* permanent preparations, a few drops of blood are mixed with about twice their volume of isotonic saline. The tube is centrifuged to deposit the cells, and the supernatant fluid is poured off. The cells are resuspended in a solution of 0.5% methyl violet in isotonic saline (filtered immediately before use). The tube is centrifuged again and films are made at once from the deposit; these are air dried and mounted without any fixation or counterstain. Blood may be taken by finger prick or by venepuncture into citrate or ethylenediamine tetra-acetate (EDTA). By either of these methods Heinz bodies are shown as darkly-stained, discrete particles. The red cells are pale yellow, almost colorless; reticulocytes show a diffuse mauve mottling.—H. W. W.

Gunn, D. R. and Molesworth, D. B. The use of tibialis posterior as a dorsiflexor. J. Bone & Joint Surg. 39B (1957) 674-678.

This is a description of technique based on work done in 56 cases, all but 2 of them leprosy patients at Sungei Buloh, stimulated by a report by Watkins *et al.* in 1954. (Subsequently it was learned that Brand has been using the same transplantation, but by another technique.) Cases were selected, regardless of age, if they had: (1) complete paralysis of the muscles supplied by the lateral popliteal nerve; (2) a reasonable range of passive dorsiflexion; and (3) an active and powerful tibialis posterior. Four incisions are used. Through the first one, on the medial side of the foot, the tibialis posterior tendon is freed from its attachment. Through the second one, just behind the

medial malleolus, the tendon is hooked out. Through the third one, about 6 inches long and just lateral to the crest of the tibia, the tibialis anterior is exposed and stripped from the anterolateral surface of the tibia in order to expose the interosseus membrane. A probe is then passed along the tibialis posterior tendon from behind the medial malleolus into the anterior compartment of the leg. The tendon is sutured to the probe, pulled through into the anterior compartment, and then passed laterally behind the tendon of the tibialis anterior. The point of insertion of the tendon is the intermediate cuneiform, and this area is exposed through a false incision and a tunnel is then made through the bone with a gouge. A pull-out wire is inserted into the tendon, and the tendon and suture are drawn subcutaneously into the wound on the dorsum of the foot. The wire is then threaded onto a straight needle and thereby passed through the tunnel in the bone and out onto the sole of the foot. With the foot fully dorsiflexed, the tendon is pulled down into the tunnel and firmly secured. An oval lead plate pierced with two small holes is moulded to the sole of the foot, and the ends of the wire suture are drawn out through the holes, and tied firmly over rubber tubing. A strong catgut suture is then inserted into the tendon and through the periosteum in front of the tunnel through the bone. A well padded plaster is then applied. The skin sutures are removed after 3 weeks and the wire suture 7 weeks after operation; weight bearing is not allowed for a further 2 weeks. Reeducation has been easy with most patients. Of the 56 patients, 49 have shown satisfactory results, with a sufficient range of controlled movement to allow them to walk well.—AUTHORS' ABSTRACT.

FRITSCHI, E. P. Recent advances in reconstructive surgery in leprosy. Leprosy in India **30** (1958) 83-88.

Reconstructive surgery of the face and extremities has made considerable progress, but the maximum can be attained only when general surgeons are prepared to treat leprosy patients like any other patients. The effects of a pure nerve lesion are easily corrected, but where complications (e.g., contractures, bone damage, loss of digits) have been allowed to develop the results can never be good. It is therefore of paramount importance that prevention of complications should be part of the work of every treatment unit. Drop foot can sometimes be prevented by splinting and bed rest during the early few weeks of neuritis or paralysis. In established drop foot, transposition of the tibialis posterior tendon has given good results. When there is uncomplicated paralysis of the hand, the patient must be instructed how he can prevent complications, to keep his hands in condition for successful surgery. The operation originally used for the correction of ulnar paralysis has now been almost completely abandoned because of the tendency of the tendon to overact and produce the opposite deformity. The present operation is a free graft making use of the extensor carpi radialis brevis; this has been very successful. The paralyzed thumb can be corrected by a tendon transfer, but care should be taken that the thumb web is not allowed to contract as this makes the operation more complicated. Wrist drop requires a series of tendon transfers and arthodesis of the wrist. Plastic surgery offers a wide field in the treatment of deformities of the face. Patients can be given new eyebrows by transferring skin from the scalp with its arterial pedicle. Trimming of the ear should be done carefully to avoid a scar on the outer edge. The reconstruction of the nose is a study in itself. Minor degrees of collapse of the ridge can be treated by a bone graft inserted into the ridge and columella. More advanced contractures are best treated by amputation of the nose and total rhinoplasty, which is a development of the old operation done first in North India by ancient surgeons. Lagophthalmos can be corrected by a number of methods, the efficacy of which is being tried out; the standard procedure, although effective, is very unsightly. Reconstructive surgery, which offers hope of rehabilitation, should be practiced in specially equipped and staffed centers situated in endemic areas.—[From abstract.]

MANUEL, C. Rehabilitation in leprosy. Leprosy in India **30** (1958) 65 (abstract only).

The writer, as a social worker in the Orthopaedic Research Unit, outlines her ideas regarding rehabilitation, especially of patients discharged from the sanatoria as negatives. It is suggested that many rehabilitation units, each with a specialist, physiotherapist and social worker, should be opened in the country. Deformity being caused by paralysis and anesthesia, the surgeon can treat paralysis by surgery, and the physiotherapist can prevent deformities by teaching the patients how to care for the hands and feet. Those who are already skilled in their trades are given special instructions, and unskilled patients are given training for which they have a natural aptitude, without doing any harm to themselves. She divides the patients into three groups: (1) With no or mild deformity, who should be given instructions and allowed to find employment as ordinary citizens. (2) With visible deformity, who should be treated surgically and encouraged to take suitable trades. (3) With gross deformity who should be provided with "sheltered industry." Careful watch should be kept on these groups, and public conscience should be aroused so that it becomes more alive to meet the needs of this problem, and the prejudice disappears.—[From abstract.]

TARABINI C., G. Consideraciones del origen de la disproteinemia hanseniana y sus efectos. [Consideration of the origin of ysproteinemia in leprosy and its effects.] Rev. Leprol. Fontilles **4** (1957) 227-234.

Determination of the total serum proteins in 100 leprosy patients, using the densimetric system, showed that the lepromatous type is characterized by an evident tendency toward hyperproteinemia. The results of 50 protein separations by the paper electrophoresis system—divided into 5 groups according to the state of the disease—show that the disproteinemia is due principally to a hyperglobulinemia, and especially to increase of the gamma globulin. The damage caused by this disproteinemia, of which visceral amyloidosis is the most important effect, shows the basic moments that produce the symtomatologic picture of the disease. These are: (*a*) the granuloma of leprosy, (*b*) the blood plasma changes, and (*c*) the store of paraproteins, especially amyloid, in the visceral organs. These three moments are bound by dependent causes and, why they coexist, they determine the irreversible course of the disease, in general interrupted only by the action of specific treatment.—[From author's English summary.]

TARABINI C., G. Colesterina y lipoproteínas séricas en la enfermedad de Hansen. [Cholesterin and lipoproteins of the sera in leprosy.] Rev. Leprol. Fontilles **4** (1957) 235-245.

Studies of the total blood cholesterol (Sols method) in 52 leprosy patients, and of separated serum lipoproteins (by paper electrophoresis) in 24 patients, gave the following results: (*a*) Patients in good condition show low cholesterol levels, while the alpha and beta lipoproteins maintain a normal relationship. Perhaps contributory is the lipoid assimilation by the lepromatous granuloma, which needs it for the bacillary growth and for the formation of the characteristic fats. (*b*) Patients with lepra reaction, and patients with hepatic troubles, also have low cholesterol levels but a relative decrease of alpha lipoprotein. It is believed that the liver disturbance and hypoactivity of the suprarenals contribute to this state. (*c*) Patients with kidney trouble (nephrotic syndrome), and patients with both kidney and hepatic troubles, show a high cholesterol level and a very low alpha lipoprotein proportion. However, treatment of such (*c*) patients with ACTH or one of the corticosteroid hormones reduces the cholesterol total and increases the proportion of the alpha lipoprotein (together with improvement of the proteinogram and the general condition, and decrease of proteinuria). Also the (*b*) patients, when treated with those hormones, show a relative increase of the alpha lipoprotein. All this is a confirmation of the great importance which the suprarenal gland

has on the seriously affected liver and kidney in the severe cases of leprosy.—[From the author's summary in English.]

TARABINI, C., G. Glicoproteínas séricas en la enfermedad de Hansen. [Glycoproteins of the sera in leprosy.] Rev. Leprol. Fontilles **4** (1957) 247-254.

With paper electrophoresis and staining with toluidine blue (method of Benhamou *et al.*, which stains all the acid and neutral glycoproteins after acidification) the serum glycoproteins show slight modification in leprosy patients who are in good general condition. There is generally slight or moderate decrease of the glycoalbumin, and various modifications of the glycoglobulins, notably an almost general increase of gamma glycoglobulin. In patients with lepra reactions, with or without hepatic disturbance, there was seen a large decrease of glycoalbumin and a general increase of $alpha_2$, beta and gamma glycoglobulins. In nephrotic patients there is a great decrease of glycoalbumin, and in general a very large increase of $alpha_2$ beta and gamma glycoglobulins. Such patients treated with ACTH and corticosteroid hormones show a large increase of glycoalbumin and a great improvement of the glycoglubulins, although they rarely become normal.—[From the author's summary in English.]

TARABINI, C., G. Acerca de las uroproteínas en la nefrosis hanseniana. [Uroproteins in leprous nephrosis.] Rev. Leprol. Fontilles **4** (1957) 255-269.

The nephrotic syndrome in leprosy is almost always accompanied by a renal amyloid process, determined by the presence of paraproteins in the blood. The study of 39 uroproteinograms showed that the fractional percentage of the albumin is lower in the serious patients and increases when the renal function improves, while the globulins and especially the gamma globulin have the opposite behavior. The renal passing (or renal factor) of proteins examined in 17 cases did not show much difference between the serious cases and the less serious cases, probably due to the fact that the cases were always chronic. Nevertheless, in the serious cases the titers of the renal factor of the albumin and the gamma globulin are higher, and those of the alpha and beta globulins are lower. Regarding the total glycoproteins of the urine, staining the electrophoresis paper by the Benhamou *et al.* method reveals that the glycoalbumin is low in the serious cases while the glycoglobulins are high, and particularly the gamma fraction; while on the other hand, in the not serious cases the glycoalbumin is high and the $alpha_2$ and gamma glycoglobulins are low. Various attempts to stain possible urinary lipoproteins were without results.—[From the author's summary in English.]

IMAEDA, T. Phosphorus metabolism in the leprous lesions. I. Histochemical study of phosphatases in the cells in tissue cultures. La Lepro **27** (1958) 1-13 (in English).

The nodule of von Rechlinghausen's disease, tuberculoid great auricular nerves, lepromatous dermis, tuberculoid dermis, and rat sciatic nerves were cultivated *in vitro* for a study of the character of cultivated cells and the various phosphatase activities. Schwann cells are seen in the outgrowth of nerves, but the interstitial fibroblasts of the nerves compose the greater part of the outgrowth. The cells cultivated from dermis are also fibroblasts. The cultivated cells show a similar distribution of phosphatases in spite of the different characters of the explants. Acid and alkaline glycerophosphatases are in the cytoplasm of all the cultivated cells, but they are also found in the nuclei of degenerating and degenerated cells. Mitotic cells show strong activity in the chromosomes. DNA-phosphatase occurs only in nuclei, but RNA-phosphatase shows activity in both cytoplasm and nuclei. ATOase and ADPase show activity in all cell elements. The distribution of phosphatases changes in acetone-fixed cells, compared with unfixed cells. —[From the author's summary.]

Imaeda, T. Phosphorus metabolism in the leprous lesions. 2. The histochemical study of phosphatases in the leprous lesions. La Lepro **27** (1958) 14-25 (in English).

Phosphatase activity is observed in lepromatous and tuberculoid lesions of both skin and nerves, and also in murine lepromas, using *a*-glycerophosphate, DNA, RNA, ATP and ADP as substrates. Both epithelioid tubercles in tuberculoid lesions and lepromas in lepromatous lesions show the various phosphatase activities similarly. The significance of phosphatase activities in lepromatous and tuberculoid lesions is discussed. Phosphatases are more marked in tuberculoid and lepromatous nerve lesions than in skin lesions, suggesting that the phosphatases are related to the splitting of nerves. Murine lepromas show a distribution of phosphatases similar to that of lepromatous skin lesions in human leprosy.—[From the author's summary.]

Aramburu, N. D., Sanchez Caballero, H., Cabrera, J. M. P. and Capurro, E. T. Resultados de la "Becegización" en sanos convivientes. [Results of BCG vaccination in healthy contacts.] Leprología **1** (1956) 138-140.

It appears that there are no significant differences between the three BCG dosage schemes which were used (all oral) as regards their ability to produce conversion of the lepromin reaction. On repeating the series of BCG vaccinations the percentages of positivization increased each time. In the first vaccination, 55 (55%) of 100 contacts tested became lepromin positive. In the second vaccination of 25 who had not become positive, 17 (68%) now did so. Of the twice-persistent negatives, 3 were given a third course of BCG, and they all became reactive.—[In part from authors' conclusions, supplied by G. Basombrio.]

Olmos Castro, N., Zamudio, E. and Arcuri, P. B. Consideraciones sobre un plan de vacunación con B.C.G. en lucha antileprosa. [Comments on a vaccination program with BCG in antileprosy campaign.] Leprología **1** (1956) 128-137.

The authors have studied the sensitivity provoked by BCG vaccination, in presumably healthy noncontacts, to a nonsensitizing protein antigen from lepromas which they called *lepromina* [now *leprolina*] *proteica total* (LPT). There was more sensitization to this antigen when the BCG was given intradermally (81% positive) than when given orally (51%). They believe that LPT is an ideal antigen for the study of cosensitization. They suggest a plan of BCG vaccination in which LPT would be used in the pre- and post-vaccination control. Comparative studies of the percentages of positivity to LPT with BCG can create, in supposedly healthy persons, a state of resistance to leprosy infection.—[From authors' summary, supplied by G. Basombrio.]

Chaussinand, R. A propos de l'utilisation d'antigène dilué pour l'épreuve à la lépromine. [Concerning the use of dilute antigen for the lepromin test.] Bol. Serv. Saude Publ. (Lisbon) **3** (1956) 179-184.

The author is not pessimistic about the availability of leproma material for lepromin for years to come, provided lesions from newly found lepromatous cases are taken (before treatment) for the purpose, but he nevertheless discusses the attempt of Floch to introduce the use of high dilutions. He objects to Floch's use of certain additives to the 1/750 dilution to reinforce its activity, because any effect would necessarily be service in Paris, multiple injections in each case] has shown that dilutions higher than normal can be used. "The 1/60 dilution gives practically the same results as the normal lepromin of Wade (1/30); the 1/200 dilution can be used if necessary (*à la rigeur*), although it produces reactions which are clearly weaker." It is important to standardize regular lepromin for routine use, but much more important to standardize dilute lepromins for experimentation. Trials with such dilutions should be done by competent nonspecific. His own experiments [on (personal communication) 42 cases of benign forms of leprosy, either at the Rovisco-Pais leprosarium in Portugal or in his own

leprologists in different countries with tuberculoid and indeterminate cases in different stages. Results in previous studies are not comparable because of the different lots of lepromins used, different concentrations, and different dosages.—H. W. W.

BASOMBRIO, G., JONQUIERES, E. D. L. AND SANCHEZ CABALLERO, H. J. Test de Mitsuda con leprominas de Floch. [Mitsuda test with Floch lepromins.] Leprologia **1** (1956) 151-155.

This is a comparative study of the Mitsuda-Hayashi lepromin (regular, LMH, 1/20), and Floch's two reinforced 1/750 dilutions, one containing glycerin and oil of vaseline (LGV), the other a normal skin extract (LNS). Positive results with LMH and LGV coincided in 80% of tuberculoid cases, and between LMH and LNS in 72%. Floch's LGV would therefore be economical in testing such cases. It would not, however, be useful in testing contacts, because only the 28.5% of these gave positive results with this antigen instead of the 82.8% positive responses with the Mitsuda-Hayashi's lepromin.

—AUTHORS' ABSTRACT

FUKUDA, M. Relationship between the quantity of bacteria in the Dharmendra antigen and the skin reaction. Studies of the lepromin reaction (Part 5). La Lepro **27** (1958) 37-43 (in Japanese; English abstract).

The lepromin reaction was tested in leprosy patients using Dharmendra's antigen 1,000, 5,000, 10,000 (regular concentration), 30,000, 50,000, 70,000, 100,000, 300,000 and 1,000,000. Injection of concentrated solutions (1:1,000, 1:5,000) in lepromatous cases which had given negative results to the original antigen (1:10,000) showed a slight increase in the early reaction but a conversion to positive was rare, whereas the late reaction frequently became positive, especially in the case of the 1:1,000 antigen. With the diluted antigens, both the early and late reactions were weaker. In the non-lepromatous cases, which had given positive results with the original antigen, dilution of the antigen resulted in a weakening of the reactions, early and late. Using Dharmendra's antigen only the early reaction is of value in type classification, and up to 3-fold dilutions of the original antigen are quite accurate. It is suggested that up to 7-fold dilutions (1:70,000) may be used, but in this case new criteria for evaluation should be devised.—[From the English abstract.]

DAVEY, T. F., DREWETT, S. D. AND STONE, C. Tuberculin and lepromin sensitivity in E. Nigeria. Leprosy Rev. **29** (1958) 81-101.

To study further the relations between tuberculin and lepromin sensitivities in Eastern Nigeria, simultaneous tuberculin and lepromin tests were made (*a*) on 3,000 school children in six localities, one urban, the others rural; and (*b*) on the entire population of a group of four villages comprising just under 2,500 individuals. Tuberculin sensitivity to a 10 TU dose was frequent in the urban area, less so in the rural areas. Late (Mitsuda) lepromin sensitivity [sic] also showed considerable variation, but during the years of childhood it followed a different pattern. Although it is possible that in the urban area, where tuberculosis was rife, tuberculosis infection was contributing to lepromin sensitivity, no evidence could be found in rural areas, where tuberculosis was at a lower level, that tuberculin sensitivity was having any appreciable influence on lepromin sensitivity during the years of childhood, in spite of the fact that both sensitivities tended to be associated, both in their occurrence in the same individuals and in their intensity. In the whole communities examined this association was also found, although when both sensitivities attained stable levels in adult life it largely disappeared. The association operated in both directions, and no satisfactory evidence could be found that tuberculin sensitivity was influencing lepromin sensitivity to any appreciable extent. In all localities early (Fernandez) lepromin sensitivity was at a very low level. It is very doubtful that contact with *M. leprae* could alone be held responsible

for the levels of lepromin sensitivity found, and their variation from place to place. In this, and in the steady levels maintained by lepromin sensitivity during adult life, nonspecific geographic and constitutional factors appear to be operative, and the possibility arises that they are responsible for the association found between tuberculin and lepromin sensitivity in these areas.—[From authors' summary.]

KUPER, S. W. A. Tuberculin and lepromin sensitivity in the South African Bantu. A pilot survey. Lancet **1** (1955) 996-1001.

A survey was made in three groups of South African Bantus to see if there was any correlation between the reactions to tuberculin and the "lepromin" used. These groups consisted of 102 patients with leprosy, 52 lepromatous and 50 tuberculoid, mostly adults but some children 10-16 years of age; 57 adult males with pulmonary tuberculosis; and 114 healthy adult males for controls. The tuberculin used was a PPD; the lepromin was the Dharmendra antigen. A positive correlation between the two reactions was found only in the tuberculosis group, which patients showed more reactivity to the leprosy antigen than did the controls. A dot diagram shows that only 2 of the 52 lepromatous cases gave positive 48-hours reactions to the lepromin antigen, against 28 of the 50 tuberculoid cases. There was no difference in this respect between the tuberculin-negative and tuberculin-positive lepromatous cases, but a distinct but not very marked difference in the tuberculoid cases in favor of the tuberculin positives. A small proportion of the lepromatous patients showed a very high degree of sensitivity to tuberculin, but when these were excluded the two main groups of leprosy patients did not show greater tuberculin sensitivity than the controls. It is concluded that there is no simple and direct relationship between positivity to tuberculin and to lepromin [Dharmendra antigen], but that observations in patients with tuberculosis and lepromatous leprosy suggest the existence of a relationship of some kind.—H. W. W.

KUPER, S. W. A. Sensitivity to human and avian tuberculin among Africans in the Union of South Africa. Tubercle **39** (1958) 380-387.

In connection with a pilot study among Bantus (see preceding abstract) an attempt was made, by comparing sensitivities to human and aviam tuberculins, to ascertain if some possibly common factor might be present—referring to the so-called nonspecific reactivity to tuberculin recently studied by WHO teams. First, a 1 TU dose of each tuberculin was given; after 48 hours, 10 TU injections were given if indicated; after another 48 hours similarly with 100 TU. One group consisted of nearly 500 tuberculosis patients. A total of over 1,000 school children clinically and roentgenology free from tuberculosis were also tested, partly in a rural school (mostly 10-19 years old) and partly in a school in an urban slum (mostly 2-6 years old). In the tuberculosis patients, the 1 TU dose of human tuberculin brought out somewhat more positives than did the 1 TU dose of avian tuberculin, 95% vs 85%. (With 10 TU the difference was slight, and with 100 TU it was nil.) With the schoolchildren, however, the reverse was the case, for they showed relatively greater sensitivity to avian. It is stated that, in 1,048 subjects, 1 TU of human tuberculin elicited 305 reactions (29.2%) while 1 TU of avian elicited 418 (40.8%). Of 411 positive to 1 TU avian, only 261 (63.5%) were positive to 1 TU human—22 of them (5.4%) being negative to even 100 TU of human. Of 189 positive to 100 TU of avian, no less than 108 (57.2%) were negative to 100 TU of human; and among 144 who were negative to 100 TU of avian, all but 8 (5.5%) were negative to the same dose of human. From another angle: Of 191 individuals who reacted only to the largest (100 TU) dose of human tuberculin, 60 (31.4%) were positive to as little as 1 TU of avian, and 59 (30.9%) to 10 TU, while 64 (33.5%) required 100 TU; only 8 (4.2%) were negative to the last dose. Thus ". . . avian tuberculin was more successful than human in eliciting reactions in healthy subjects." Analysis of the data from the two groups, each divided at the 10-year line to help compensate

for the unbalance in ages, shows that the rural children had a materially greater excess of avian over human positives than did the urban school, although there was a slight difference in the same direction even there. Regarding the age factor—so far as concerns the rural children, at least—the difference in favor of avian was greater in the younger group, "suggesting that sensitivity to avian is acquired at an earlier age than that to human." In the urban children (generally much younger) the greater efficiency of avian was little evidenced at the 1 TU level, but very much more so at the 100 TU level. (Of 82 children positive to 1 TU avian, 64 (78%) were also positive to 1 TU human, but of 93 in whom it required 100 TU of avian to produce positive reactions, only 14 (15%) reacted to 100 TU of human.) These results cannot be ascribed to error in standardization of the tuberculins, it is held, because of the contrary results in the tuberculosis patients. The findings suggest the presence of "the type of sensitivity referred to by WHO teams" as nonspecific.—H. W. W.

COHN, M. L., DAVIS, C. L. AND MIDDLEBROOK, G. Airborne immunization against tuberculosis. Science **128** (1958) 1282-1283.

The authors present results of a complete innovation as regards the route of inoculation of BCG for artificial immunization against tuberculosis. They have, for the first time, employed inhalation of nebulized suspensions to "infect" and immunize guinea-pigs. Even when the numbers of inhaled bacilli were very small the treated animals, on challenge by the same route, showed evidence of immunization macroscopically, histologically, and by colony counts of suspensions of lung and spleen. The amount of immunity, as represented by colony counts, was practically as great in those guinea-pigs which received the minimal effective dose of BCG as in those which received 100 times that dose. The degree of immunity was as great as after subcutaneous injections of "many thousandfold" as many viable BCG organisms. Inhalation of the nebulized vaccine produced no pathologic abnormalities except for occasional and slight enlargement of the mediastinal nodes, which contained a few microscopic collections of epithelioid cells with small numbers of acid-fast rods. However, the effects produced evidently depend upon multiplication of the BCG organisms, for if that was prevented by INH treatment there was no development of hypersensitivity or immunity. These results, obtained with a commercial strain of BCG, were confirmed with one of two strains derived from another stock but not by the second of those derived strains, although the latter is effective when inoculated subcutaneously. The authors' brief abstract is as follows: Inhalation of very small numbers of living attenuated (BCG) organisms and their multiplication in guinea pigs results in the development of acquired resistance against subsequent airborne infection with virulent tubercle bacilli. Different strains of BCG have differing capacities to immunize by this means.—H. W. W.

PEPYS, J., BRUCE, R. A. AND JAMES, D. G. Multiple puncture depot tuberculin (PPD) cream tests in man. Tubercle (London) **39** (1958) 283-288.

It has been reported that a "depot tuberculin" made with an emulsion of liquid paraffin and lanolin shows increased potency and other features of interest. The present authors here report the results with such a preparation ("ointment") made with "wool alcohol (B.P.)," an anhydrous kind of Eucerin [a brand of a hydrophilic wool-fat product]. PPD tuberculin, 5 mgm./gm., is incorporated into that substance; the inoculations are made by the Heaf multipuncture method. Of 32 young nurses and 389 factory employees, who respectively gave 40% and 83% positive reactions to Mantoux tests (up to 100 TU of OT), 90% and 93% were positive with the depot cream, including all of the Mantoux positives. On the other hand, of 49 children aged 1 month to 14 years tested with the cream only, all gave negative results. Of 32 subjects who were negative to both tests and were vaccinated with BCG, all gave normal vaccine reactions, while all of 14 nurses who were definitely positive to the depot-cream test

but negative to 100 TU Mantoux gave accelerated reactions to BCG. This was the "infra-tuberculin allergy" of de Assis, directed toward the mycobacterium rather than the tuberculin [in this case, however, elicited by the depot tuberculin instead of bacillus bodies], showing "that the agent responsible for the low degree of sensitivity is related immunologically to *Myco. tuberculosis.*" The low degree of sensitivity is not due to incapability to react, as shown by positive conversion by BCG vaccination. Sites of negative cream reactions became positive after BCG vaccination. The anhydrous Eucerin used was better than the softer "L.M." brand. Lanolin (hydrous wool fat) was unsatisfactory, as was "white soft paraffin." [It would be interesting to know if the product used would serve as a general intensifier of skin reactions, with various kinds of antigens, and especially what effect it would have with high dilutions of lepromin.] —H. W. W.

Cannefax G. R., Ross, Sr. H. and Bancroft, H. Reactivity of the RPCF test in leprosy compared with other syphilis tests. Publ. Hlth. Rep. **74** (1959) 45-48.

The sera of 248 presumably nonsyphilitic leprosy patients, tested with the following five serologic tests, gave the positive percentages indicated: TPI (*Treponema pallidum* immobilization), 4.8%; RPCF (Reiter protein complement fixation), 3.2%; TPCF (*Treponema pallidum* complement fixation), 15.3%; VDRL slide test, 27.4%; and Kahn, 35.9%. The results with the RPCF and TPI tests most closely approximated the expected serologic activity in relation to clinical and anamnestic information. It appears that the reliability of the RPCF test with serums from patients with leprosy is as great as the TPI test, and greater than the TPCF, VDRL, and Kahn tests.

—Authors' Abstract

Rossetti, C., Doglioni, L., Guillen, J. and Tarabini, C., G. El test de Nelson-Mayer en la enfermedad de Hansen. [The Nelson-Mayer test in leprosy.] Rev. Leprol. Fontilles **4** (1957) 213-226.

The lengthy English summary gives summarily the results obtained with 4 serological tests applied to 300 sera at the Fontilles Sanitarium, and with other tests of 61 selected sera sent elsewhere for testing. Of these 61 specimens only 4 were positive with the Nelson-Mayer *T. pallidum* immobilization (TPI) test, and those patients undoubtedly had syphilis. This test, therefore, is regarded as highly specific.—H. W. W.

Ranadive, K. J., Nerurkar, R. V. and Khanolkar, V. R. In vitro studies on human leprosy. Indian J. Med. Sci. **12** (1958) 791-796.

Involvement of peripheral nerves and ganglion cells of somatic and autonomic origin appears to be the most consistent feature of leprosy as revealed by histological study, the causative organisms exhibiting a particular disposition to migrate towards the sensory and sympathetic nerve fibers. To explore this phenomenon the authors set up a series of tissue cultures and studied the response of human fetal spinal ganglia and skeletal muscle to *M. leprae in vitro*, with adequate controls. The human fetal tissue, 10-20 weeks of age, was grown in solid plasma-clot cultures in association with fragments of fresh lepromatous tissue. The cultures were stained Ziehl-Neelsen 72-96 hours of explantation of the lepromatous tissue. Of the spinal ganglion cultures, 78% showed fibrocytes containing acid-fast material in some form, but only 7% of the cultures of skeletal muscle showed acid-fast material in the fibrocytes. None of the control cultures of skeletal muscle showed such material in the fibrocytes, and among the control cultures of spinal ganglia a few rare fibrocytes in 7% showed faint acid-fast granules in the cytoplasm, the nature of which could not be determined. Thus human lepra bacilli were attracted towards the spinal ganglion cultures and were then taken up by the fibrocytes. The spinal ganglion fibrocytes displayed strong phagocytic activity for the bacilli which was not observed in the fibrocytes of skeletal muscle.—[From Foreign Letters, *J. American Med. Assoc.* **169** (1959) 273.]

CHATTERJEE, K. R. Electron microscopy and cytochemistry of *Myco. leprae* and leprous tissue. Leprosy in India **30** (1958) 79-82.

Comparative studies of phase micrographs of living bacilli, electron micrographs, and photomicrographs of stained bacilli taken from the same specimen have shown that morphologically *M. leprae* may be divided into two broad types: (*a*) solid, uniformly dense bacilli, of uniform diameter or with tapering ends, and (*b*) bacilli with alternate light and dark zones. They may appear as oval bodies with single or double polar condensations, elongated forms with double polar condensations, or elongated with alternate light and dark zones. Each bacillus has a thin enveloping membrane around it. A gloea-like substance can be detected around almost all bacilli, and particularly around clumps. Studies of host-parasite relationship by electron microscopy have revealed the presence of bacilli in the cutaneous nerve endings—inside the end organs of touch corpuscles, in the myelin sheath, in the Schwann cell, and in the nerve axon; also attached to nerve fibrils. The cytochemical study confirmed the different morphologic structures of the leprosy bacilli. The nucleus is generally located in the center and contains desoxyribonucleic acid (DNA), which increases its activity during growth and multiplication. The alkaline phosphatase activity is most marked in bacilli in the growing and dividing phases. The cytoplasm contains ribonucleic acid (RNA), mucopolysaccharides, and lipids. The polar condensations, and similar structures in the cytoplasm, being Nadi positive, contain cytochrome oxydase and are evidently the mitochondria. These structures also contain lipids both in free and bound forms in combination with phosphorus and calcium. The cell membrane is rich in mucopolysaccharides. The gloea-like substance seems to contain a complex form of lipids. The nerve fibers, endothelial lining of the blood vessels, and nuclei of various cells in the granuloma show increased alkaline phosphatase activity. The tissue polysaccharides were distributed in focal concentrations in the epidermis and the subepidermal zones; in the dermis they were most abundant in areas where the bacillary concentration was heavy. The macrophage cells showed the presence of mucopolysaccharides. Lipids, in both free and bound forms, in combination with calcium and phosphate were found in histiocytes and macrophages in variable concentrations, greatest in foamy cells.—[From abstract.]

MUROHASHI, T. AND YOSHIDA, K. Cytochemical studies on the differentiation of living and dead acid-fast bacilli. Acta. tuberc. Scandinavica **34** (1957) 208-225.

———— AND ———— Improvement of malachitegreenfuchsin staining; a differential staining method of tubercle bacilli. Ibid. 36 (1958) 195-198.

1. This study is based primarily on a report by Lack that, with a malachite green-safranin sequence, living tubercle stain green and dead ones pink. This staining, which is independent of acid-fastness, has been thought to depend upon the chemical structure of bacterial DNA, which when highly polymerized combines specifically with methyl green and analogous triphenylmethane dyes. Green-staining tubercle bacilli still stained that way after killing by heat, but became pink-staining after various other treatments to which they were subjected, an effect attributed to depolymerization due to some (autolytic?) enzyme reaction but not to dehydrogenase activity. Culture experiments suggested that the vitality of some of the green-staining bacilli might be too low to permit multiplication.

2. The method is improved with respect to the method of decolorization (differentiation) and counterstaining.—H. W. W.

MUROHASHI, T., YOSHIDA, K. AND TSUCHIMOCHI, T. Improvement of the malachitegreen-fuchsin staining as the differential staining method of tubercle bacilli. Med. & Biol. **46** (1958) 184-186.

The original malachite-green-fuchsin staining technique reported by the authors was based on experiments made with stock cultures of tubercle bacilli. The acid treat-

ment and the counterstaining, however, were found not to be the most suitable for the differential staining of the bacilli contained in the sputum or a lung cavity. The technique has been improved and, at the same time, simplified in order to facilitate its daily application. The concentration of HNO_3 for decolorization of fuchsin was reduced, and efforts were made to decolorize the background sufficiently and to counterstain it simultaneously. With this improved differential staining, the authors state, the bacilli—either green or red—can be distinguished distinctly from the background materials, which are stained faintly a yellowish-brown color. Method: (1) Make thin and even smears, dry and fix them. (2) Stain in 1% malachite green at 50-55°C, 5 mins. (3) Cool at room temperature for about 10 mins. A few drops of the malachite green solution are poured on the slide to prevent drying. (4) Rinse in water, gently and thoroughly. (5) Stain in carbol-fuchsin, 1:10 dilution, for about 5 mins.; optimal temperature, 18-20°C. (6) Wash in water, and without drying decolorize and stain simultaneously for 20 secs. in the following solution: (*a*) Add 4 parts of 1% bismark brown to 1 part of 1% picric acid, and filter, after 6 hours to overnight. (*b*) 1% HNO_3 solution. Mix 30 cc. of (*a*) with 100 cc. of (*b*) for use. (7) Rinse in water, dry and examine.—Yoshio Yoshie

Lack, C. H. The malachite-green safranin stain. Tubercle **39** (1958) 125-126 (correspondence).

The writer discusses further observations of his staining method published in 1953. Method: Fix by gentle heat, osmic acid vapor, or formalin. Stain with 1% aqueous malachite green, at least 10 mins. at 70°C; wash with 1% acid alcohol; rinse. Counterstain with 0.5% aqueous safranin, 5 mins; rinse and dry. There are forms, probably young, which remain unstained but can be demonstrated by nigrosin or India ink after the safranin. The staining (green or pink) is unrelated to acid-fastness or gram positivity. Recent studies, especially by Murohashi and Yoshida, indicate the green stain is held by desoxyribonucleic acid, for the staining is abolished by treatment with desoxyribonuclease but not by ribonuclease. "The hypothesis is then, that as a result of senescence or interference by antibiotics, a change occurs in the dexosyribonucleic acid structure of mycobacteria which is irreversible, and which is reflected in the inability to combine with the triphenyl methane group of dyes."—H. W. W.