

CURRENT LITERATURE

The current literature of leprosy is dealt with in this department as fully as possible. It is a function of the Contributing Editors (see inside of front cover) to provide abstracts of all articles published in their territories, but when necessary abstracts are taken from other sources.

HUIZENGA, L. S. Robert Bruce, the leper king of Scotland. *Lep. Quart.* 12 (1938) 149-155.

Describing the life of Robert Bruce, the most beloved king of Scotland, who, although he is said to have had leprosy, enjoyed the following of his soldiers until his death. Two old woodcuts of Robert Bruce are reproduced.

—AUTHOR'S ABSTRACT

HUIZENGA, L. S. The leper in legend and history. *St. Francis of Assissi. Lep. Quart.* 12 (1938) 119-121.

Francis of Assissi, the greatest social reformer of the Middle Ages, is so intimately linked up with the history of leprosy that none of his biographers have failed to give prominence to the leper, who was instrumental in directing Francis' efforts to the social reconstruction of his day.—AUTHOR'S ABSTRACT

HUIZENGA, L. S. The leper in legend and history. *King Bladud of England. Lep. Quart.* 13 (1939) 18-20.

The famous baths at Bath, England, date back to King Bladud, who recovered from his leprosy by bathing in their healing waters. Historical allusions to bathing for the cure of leprosy are found in the medical history of many nations.

—AUTHOR'S ABSTRACT

HUIZENGA, L. S. The leper in legend and history. *St. Jude and the leper king of Edessa. Lep. Quart.* 12 (1939) 74-78.

The legend associated with the Apostle Jude is related. It is interesting not so much because of its historical significance as because it, like hundreds of others, proves how leprosy has been feared throughout history by peoples of every land and of every religious conviction.—AUTHOR'S ABSTRACT

HUIZENGA, L. S. Historical movements and leprosy. *Lep. Quart.* 13 (1939) 4-8.

This article traces historical movements of the past, and the greatest migration in Chinese history now taking place due to the Sino-Japanese war, and points out that if history repeats itself an increase of the incidence of leprosy may be expected.

—AUTHOR'S ABSTRACT

REISS, F. From mysticism and superstition to antileprosy serum treatment. *Lep. Quart.* 12 (1938) 10-26.

This article traces the history of leprosy treatment in brief outline from the days of superstition to the present day of serum therapy, showing that the present-day attitude toward the leper is far more sane than ever before.

—L. S. HUIZENGA

TCHIN, D. Ueber die Lepra in Kuantung. [Leprosy in Kuantung.] Japanese Jour. Dermat. & Urol. 46 (1939) 41 (abstract).

This is a summary report on leprosy in Kuantung (Manchuria), based on the author's experience over a period of two years with 213 patients who attended the Japanese charity hospital. These cases comprised 142 of nodular leprosy and 71 of the neural type; 112 were men and 101 women. Patients between the ages of 20 and 30 years were the most numerous. They appear most frequently in the warmer seasons of the year. The superstition that the disease can be transmitted to other individuals through sexual intercourse must play a role in its considerable spread in Kuangtung.—[From abstract.]

TANON, L. AND VILLARET, B. Le climat et les maladies en Océanie française. [Climate and diseases in French Oceania.] Hyg. et Méd. 1939, May.

The authors present climatological data (temperature, rainfall, relative humidity and insolation) for the French possessions in Oceania, and then discuss the relation of these factors to the incidence of certain diseases. With regard to leprosy they find that the influence of climatic variations is of much less interest than it is in connection with elephantiasis, in the spread of which the breeding of mosquitoes is important. Leprosy, which is widespread in the region and has extended greatly in the Tomatous in recent years, is much more related to the mode of life of the people, notably their lack of hygiene and their agglomeration in small communities. —H. W. W.

RODRIGUEZ, J. N. The importance of epidemiological studies of leprosy. Mo. Bull. Bur. Health (Manila) 19 (1939) 323-327.

The author refers to the intensive type of leprosy survey work done in the province of Cebu under the joint auspices of the Bureau of Health and the Leonard Wood Memorial, and suggests the desirability of extending the surveys to other provinces. The following advantages to be derived from the epidemiological study of leprosy, properly undertaken, are mentioned: (1) it will serve to limit the field to be controlled; (2) it will furnish the necessary data on which to base measures for the control of the disease; (3) it will promote education of the masses with regard to the prophylaxis of leprosy; and (4) it may furnish important suggestions to laboratory and clinical research workers. —J. O. NOLASCO

JOSEPH, J. J. Factors influencing the incidence of leprosy in the Madras Presidency. Lep. in India 11 (1939) 3-13.

The chief foci of infection in the Madras province are in the northeast and the southwest, the former coastal and the latter inland. A hot humid climate is favorable for the spread of leprosy, while hot and dry and cold and damp climates are unfavorable; a high altitude and low vapor tension are also unfavorable. Customs—chiefly caste and marriage—favor the spread of leprosy and these help to account for the endemicity of the disease. Among students the incidence is highest among those below the age of 12, especially among those who belong to the "scheduled" class. The nearer the villages are located the larger the village population and greater the industrialization and inter-village communications, the higher the incidence. The financial status of the district is no criterion of the incidence of leprosy, but it is the economic condition of the laboring classes which appears to influence markedly the incidence of leprosy.—[From author's summary.]

OTA, M. AND YAMAGUCHI, T. Ein blick auf das sozialleben von nicht offiziell angezeigten Leprösen in der stadt Tokyo. [The social life of lepers not officially declared, in the city of Tokyo.] *La Lepro* 10 (1939) suppl. 9-12 (abstract).

In Japan the epidemiologic investigation of leprosy has been neglected; the majority of reports deal with statistical observations on ambulant lepers in the larger dermatological clinics. In Tokyo the police recorded 120 cases in 1930 and 155 in 1931, whereas the numbers of cases attending the authors' polyclinic alone each year in the period 1931-37 ranged from 119 to 245 (average 189). For 70 cases, detailed data are given regarding sex (42 males and 28 females), age distribution, type of the disease (52 macular, 12 neural and 6 nodular) and occupation. Most of them live in Tokyo, are not well-to-do, and though they are mostly adult males, capable of working, they meet with difficulties in earning a living among the nonleprous population. Approximately one-third are especially infectious. Most of them live in close contact with other members of the family, only 4 living in their own rooms. They are fond of bathing, but lacking baths in their own houses they use the public establishments. Living freely, they nullify the principle of isolation that has been adopted by the authorities. Prophylaxis should be based on extensive epidemiological investigations.—[From authors' abstract.]

IESAKA, K. Leprosy sample survey at Hismatsu, Okinawa. *La Lepro* 10 (1939) suppl. 15 (abstract).

In the regular leprosy census of Japan in 1935, 15,193 cases were recorded, but the actual number is in question and it may be two or three times as great. In Okinawa prefecture 977 were recorded, but the actual situation is particularly obscure. A sample survey of this village of 2,701 inhabitants made in 1937, revealed 30 cases (11.1 per thousand), whereas only 14 had been recorded in the 1935 census. Since, however, 4 of them had acquired the disease since then, the actual number at that time was 1.6 times the number recorded.
—H. W. W.

IESAKA, K. Leprosy survey at Yonakunijima. *La Lepro* 10 (1939) suppl. 17 (abstract).

A brief note on the findings in another locality in Okinawa prefecture. In the 1935 census only 15 cases were recorded but in 1937 the author found 26 unrecorded cases. This brought the total to 35 (6 of the original 15 having died), an incidence rate of 7.6 per thousand of the population.
—H. W. W.

HAYASHI, F., MAEDA, T., FUKUDA, S. AND NAGAI, Y. Leprosy survey in Yoron Island. *La Lepro* 10 (1939) suppl. 53 (abstract).

For this island, the most southerly of the Oshima archipelago and only 20 miles north of Okinawa, only 24 cases were recorded in the 1935 census, whereas 60 from here were admitted to the Keiaien leprosarium in May, 1938, and the authors found 18 more in an examination of 7,470 of the total population of 7,954. The total, 78, is 3.25 times the census figure. [It is interpolated that a survey of Kikai Island, made in 1937, revealed 1.8 times the census number.] Males predominated. Lepromatous cases were 23% of the whole (estimated to be 30% in Japan as a whole). The age distribution curve shifts to the left. Various other epidemiological data are given in this somewhat lengthy authors' abstract.
—H. W. W.

MOLL, A. A. Los preventorios en la lepra. [Preventoria in leprosy.] Bol. Of. sanit. Panamericana 18 (1939) 516-523.

This article, by the secretary and scientific translator of the Pan-American Sanitary Office (Washington, D. C.), is a review of the literature regarding the problem of children in leprosy. Among the subjects dealt with at more or less length are the earliest segregation laws, the susceptibility of children; "heredity" of leprosy, leprosy work in Hawaii and (more briefly) in a few other countries, and the time at which children should be separated from their leprosy parents.

—H. W. W.

MONACELLI, M. La lotta contro la lepra in Sicilia e il nuovo leprosario di Messina. [Antileprosy measures in Sicily, and the new leprosarium at Messina.] Settimana Med. (Palermo; formerly Riv. Sanitaria Siciliana) 27 (1939) 632-4, 637.

In Italy as a whole since 1923 leprosy has been notifiable, since 1926 treatment has been the responsibility of the state and since 1937 the segregation in hospital of infective patients has been compulsory. There are several endemic foci in Sicily and cases are not infrequently imported, but the author hopes that since there are facilities for treatment at Axum, Abyssinia, the disease will not be imported from that country. The remainder of the paper is a description of the new leprosarium at Messina.—[Abstract from *Trop. Dis. Bull.* 37 (1940) 48.]

LUTZ, A. A transmissão da lepra pelos mosquitos e a sua profilaxia. [The transmission of leprosy by mosquitoes and its prophylaxis.] Mem. Inst. Oswaldo Cruz 34 (1939) 475-484 (Portuguese); 485-493 (English).

This is restatement of the author's view that the mosquito transmits leprosy. It is argued (a) that cases in hospitals in European cities do not cause spread of the disease (explained by the absence of a transmitting agent); (b) that many infected persons have never had contact with lepers, and show lesions in parts normally exposed to mosquito bites; (c) that domestic mosquitoes abound in all countries where leprosy is endemic (the introduction of mosquitoes into Hawaii, it is stated, was followed by the rapid dissemination of the disease); (d) that direct inoculation experiments with human beings and animals have almost always given negative results; (e) that the "coccothrices" of leprosy and tuberculosis are not always acid-fast and show granulations which can pass filters and which may quite possibly prove to be the only infectious form. Based on this conviction the author offers recommendations for prophylaxis. [These recommendations are essentially similar to those presented in a paper sent to the Cairo conference; see *THE JOURNAL* 6 (1938) 439.]

—H. W. W.

BADGER, L. F. Discussion of possible relation of nutrition to leprosy. Tr. Hawaii Territ. Med. Assoc. (1938) 112-120.

[An abstract of a paper by this author, with essentially the same title, appears on p. 557 of this issue.]

LOWE, J. Leprosy and tuberculosis. *Indian Med. Gaz.* 74 (1939) 482-487.

In this semipopular lecture, delivered in a postgraduate course in tuberculosis, the resemblances and differences, between tuberculosis and leprosy are discussed. The author describes how in the days of Hansen and Koch bacteriological research in these two diseases developed and how work on one

disease helped that on the other. Resemblances and differences between them in immunology, transmission, clinical and pathological findings and epidemiology are briefly discussed. It is pointed out how in recent years, in both diseases, increasing emphasis is being laid on the prevention of infection of children by isolation measures, and also in tuberculosis by immunization by B. C. G. vaccine. It is suggested that if experimental work confirms the value of B. C. G. vaccine, this measure should have a wide field of application in India. It is believed that in India the tuberculosis epidemic is on the increase while the leprosy epidemic is possibly past its height. A plea is made for the incorporation of antituberculosis and antileprosy work in the public health system of the country.

—AUTHOR'S ABSTRACT

LOWE, J. AND CHATTERJI, S. N. Scarification, tattooing, etc., in relation to leprosy lesions of the skin. *Lep. in India* 11 (1939) 14-18.

The occasional appearance of leprosy lesions at the site of a previous scar is recorded, and two such cases are cited. It is believed that leprosy may occasionally be transmitted by infected instruments used in scarification, tattooing, or vaccination. It is, however, probably more common for the appearance of a leprosy lesion in a scar to be caused by a leprosy infection which was latent at the time of the injury. Leprosy lesions are often treated by scarification, application of cautery or of caustics, and by tattooing. These procedures frequently cause marked scarring which may make subsequent diagnosis difficult. Several examples are cited and illustrated, and the diagnosis of such cases is discussed.

—AUTHORS' ABSTRACT

FLORIANI, C. Síndrome tifoideo leproso. [Typhoid syndrome of leprosy.] *Prensa Méd. Argentina* 25 (1938) 1906-1908.

The patient, a female, 61 years old, C2-N1, had leprosy reaction lasting 15 days. The condition was peculiar because of the general run-down condition, to which the author gives the designation of the typhoid syndrome.

—G. BASOMBRI

SCHUJMAN, S. Un nuevo signo diferencial entre síringomielia e lepra nerviosa. [A new differential sign between syringomyelia and neural leprosy.] *Rev. Brasileira Leprol.* 7 (1939) 405-410.

In cases of syringomyelia, intradermal injections of histamin into the anesthetic patches of the skin produce a triple response, which is not observed in the anesthetic patches in cases of leprosy. In leprosy the peripheral neuritis suppresses the pathway of the axon reflex, while in syringomyelia and other conditions with anesthesia of central origin the cutaneous nerves are intact, so the histamin flare can be produced. The histamin test is a simple, rapid and accurate means of differentiating leprosy from such conditions.—[From author's summary.]

INABA, T. Ein Fall von Lepra ichthyosiformis. [A case of lepra ichthyosiformis.] *Japanese Jour. Dermat. & Urol.* 46 (1939) 67 (abstract).

A man 37 years of age showed peripheral nerve thickening and macules with anesthesia, and also an ichthyosis-like exanthema on the face, nape of neck and back, both flanks, and the extensor surfaces of the extremities.—[From abstract.]

NANBA, M. Statistische Betrachtungen über Erysipelas in Aiseien-Leprosorium. [Statistical consideration of erysipelas in the Aiseien leprosarium.] Japanese Jour. Dermat. & Urol. 46 (1939) 67 (abstract).

Patients with the nodular form of the disease suffered from erysipelas four times more frequently than those with the neural form. Its frequency showed no relation to sex. Middle-aged patients were affected most frequently, usually within one month after admission. The face is most often involved, then the lower extremities, and finally the upper extremities. Nephritis occurs as the most common complication.—[From abstract.]

TAJIRI, I. Ein Fall von akuter Infiltration bei Knotenlepra, die eine lepröse Bulbarparalyse zur Folge hat. [A case of acute infiltration in nodular leprosy that resulted in leprous bulbar paralysis.] Japanese Jour. Dermat. & Urol. 43 (1938) 84 (abstract).

A patient, 50 years old, after the course of acute infiltration showed symptoms of bulbar paralysis: neuralgia of the facial nerve, facial (Bell's) paralysis, trouble in swallowing, disturbance of taste and of speech, accessorius paralysis, etc. The order of the appearance of these symptoms is uncertain. They disappeared after some time, for the most part spontaneously, but some evidence of them persisted. The symptoms and course of leprous bulbar paralysis differ from those of progressive or acute bulbar paralysis, so that the two conditions can be clearly distinguished.—[From abstract.]

SAKURAI, H. AND KONO, M. 2 Fälle von N. accessorius-Lähmung bei Lepra. [Two cases of paralysis of the N. accessorius in leprosy.] Japanese Jour. Dermat. & Urol. 43 (1938) 75 (abstract).

Paralysis of the accessorius in leprosy is unusual, but tends to occur five years after the onset of the disease. The authors report here two cases, males, 24 and 13 years old, in which it appeared relatively early. In one it began three to five months after the onset, and in the other after two years. The right side was affected in both instances.—[From abstract.]

UCHIDA, M. Ueber die Augenmuskellähmungen bei Leprösen. [Paralysis of the muscles of the eyes in leprosy.] Japanese Jour. Dermat. & Urol. 45 (1939) 35 (abstract).

Paralysis of the eye muscles of strictly leprotic origin has seldom been described. The author reports 3 cases of this condition.—[From abstract.]

PRENDERGAST, J. J. Ocular leprosy in the United States. Arch. Ophthal. 23 (1940) 112-137.

This paper reports findings of a six months intensive study of eye conditions in patients at the U. S. National Leprosarium. The examination included testing of vision; examination of the lids, brows, conjunctiva, lacrimal sac and extraocular muscles; external and slit lamp examination of the cornea and iris; tonometric measurement; visualization of the lens and, when possible, examination of the fundus with hand and binocular ophthalmoscope. Of the 350 patients examined, 91% found to have ocular involvement of some kind. Blindness of both eyes was found in 20 (5.7%) and of one eye in 29 others (8.2%); but only 86 (24.5%) had normal vision in both eyes, and 58 others (16.5%) in one eye. A racial element appeared in the fact that, though Mexicans constituted only 25% of the patients examined, 37% of those with normal vision were of that race; white Americans, 50% of the total, con-

...only 20% of the normals; negroes seemed especially susceptible to ocular complications. The cornea is the ocular tissue most vulnerable to leprosy, the most common change being an infiltration of the deep layer of the stroma. The iris showed all gradations of involvement from a mild degree of swelling with obliteration of the anterior pattern and ectropion uveae to almost complete fibrosis and atrophy. In the ciliary body there were scattering chronic inflammatory foci around the major arterial circle. In the sclera the lesions were almost always confined to the corneoscleral junction. Lesions in the retina, optic nerve, and lens were rare. The mode of infection of the eye was thought to be endogenous. One patient showed an elevation of intraocular tension and 16 had secondary glaucoma. Xanthelasma is quite frequent on the ocular adnexae. Various types of treatment were tried and observed for several months. Quinine bisulphate ointment and thyroxin locally gave fair results in clearing up corneal infiltration. Dionin and chaulmoogra oil were not beneficial. Protein shock therapy gave good results in treatment of acute lesions. Postoperative infection in operated cases was not encountered, though the leprosy eye does not tolerate surgery very well. Emphasis is placed on the importance of protection of the eye by various means as a prophylactic measure. Twenty-eight enucleated eyes were sectioned and studied, with findings as follows:

<i>Location</i>	<i>Lesions found</i>	<i>Bacilli found</i>
Cornea	22	18
Sclera	None	None
Iris.....	13	13
Ciliary body	19	14
Choroid.....	15	9
Retina and optic nerve.....	None	None

—H. E. HASSELTINE

MOREIRA SPINOLA, C. Manifestações oculares da lepra. [Ocular manifestations of leprosy.] Congr. Argentina Oftal., 1936. Trans., vol. 2, 1938, pp. 612-618.

This study was carried out at the Rodrigo de Menzer sanatorium in the State of Bahia, Brazil, which houses 60 patients. The report comprises two parts, a review of literature and the author's personal observations. Among 22 patients he found: interstitial keratitis, 12 cases; ulcerative keratitis, 1 case; anterior staphyloma, 3 cases; and 1 case each of leproma of the conjunctiva, madarosis, total destruction of the eye-ball, and hyperemia of the conjunctiva.

—G. BASOMBRIO

NEMIROWSKY, S. La lepra en otorrinolaringología. [Leprosy in otorhinolaryngology.] Rev. Med. Rosario 28 (1938) 607-620.

The author has methodically examined the nose, mouth, pharynx, larynx and ears in 63 patients with various forms of leprosy (lepromatous and tuberculoid) in the Hospital Carrasco, in Rosario. After describing the usual lesions of leprosy in these regions, he refers to some cases in which, though there were advanced anesthetic lesions of the nasal mucosa, mouth and pharynx, the patients retained intact the functions of taste and smell. Leprosy attacks only the lobes of the ear, entirely respecting the rest of auditory apparatus.

—G. BASOMBRIO

TAJIRI, I. Ueber Leprom in der Nasenhöhle. [Leproma in the nasal cavity.] Japanese Jour. Dermat. & Urol. 45 (1939) 35 (abstract).

Such lepromas occur only in nodular leprosy. Those seen in 16 cases are single or multiple, rounded or oval in form, usually located on the upper part of the septum and the middle turbinate, with smooth or mulberry-like surfaces. They are distinguished from nasal polyps by their form, number and the character of the surface.—[From abstract.]

TACHIKAWA, N. Nail changes in leprosy (the first report). La Lepro 10 (1939) suppl. 13 (abstract).

Having investigated the matter in 1,000 cases of leprosy in the Aiseien leprosarium, 363 of whom were found to show nail changes [regarding the histological findings see THE JOURNAL 8 (1940) 240] the author classifies those changes as of three kinds: atrophy, malformation, and inflammation of the nail-bed. Many of these 363 cases were found in farmers, but since in Japan most lepers are from the peasant class it was not possible to ascertain if there is any relationship between the condition and occupation. However, nail changes are chiefly to be observed among those who are most liable to receive injuries of the hand, such as farmers and laborers. There is no connection between the changes and the age at which leprosy is contracted. On an average they do not appear until 14 years after onset in nodular cases, and 22 years in neural cases. In nodular cases a predominant number show inflammation of the nail-bed and a smaller number of examples of malformation, while in nerve cases malformation is of more frequent occurrence than inflammation, and atrophy is most frequent. Nail changes are of infrequent occurrence in macular [tuberculoid] cases.—[From author's abstract.]

GALVEZ ASTEGUEITA, R. Nuevos signos en la lepra. El azul de metileno como medio de diagnostico en la lepra. [New signs of leprosy; methylene blue as a diagnostic medium.] Guatemala Med. 3 (1938) 6; also Pren. Med. Salvador (1938) 162.

Pointing out that it has been proven that the cutaneous lesions of leprosy have a selective power of fixing methylene blue, the author sees the possibility of employing this substance as an auxiliary in the differential diagnosis of the doubtful forms of leprosy, principally when the nasal secretion does not contain the Hansen bacillus. The fact that the rapidity and intensity of the coloration bear a direct relation to the richness of the lesions in bacilli, and inversely to previous treatment with chaulmoogra and its derivatives, can also be taken as indication whether or not there exists a tendency to cure.—[From abstract in *Bol. Of. sanit. Panamericana* 18 (1939) 978.]

SAKURAI, H. Interessante Fälle von Lepra mit falscher Diagnose. [Interesting cases of leprosy with false diagnoses.] Japanese Jour. Dermat. & Urol. 46 (1939) 39 (abstract).

The following cases are reported: (a) One of macular leprosy in a woman aged 24, diagnosed as urticaria or syphilis. (b) One in a woman, aged 71, also of macular type, diagnosed as a drug rash. (c) One with nodule formation and ulcers on the leg of a 28-year old plasterer diagnosed as dermatitis medicamentosa. (d) A 59-year old man with macules and anesthesia was treated for hemiplegia. (e) On the other hand, a soldier with complete anesthesia of both legs was diagnosed as leprosy but was later found to have myelitis.—[From abstract.]

In the lazareto of Guatemala the author encountered two patients, never found bacteriologically positive, whose aspect was not that of leprosy. In the town from which they came he found many similar cases, and other foci elsewhere; all were localities of temperate climate, and no case was encountered above 1,830 or below 915 meters of altitude. The disease is not very contagious; most of the cases have been isolated ones, and in only four or five families were two cases found. The age of onset is from 5 to at most 15 or 20 years. The disease begins as a small erythematous macule, some 2 to 4 cm. in diameter, ordinarily low on the leg. It affects one leg first, the other one or two years later. The macule is flat, of the color of lymphangitis or of erysipelas. On squeezing a little pain is felt, but it disappears on release of the pressure. Shortly after the lesion appears a lymph node of the inferior inguinal group hypertrophies and becomes excessively painful. Lesion and ganglion last for some 8 to 10 days; suppuration does not occur. The appearance of the erythema is marked by violent chills followed by high fever. As the lesion extends, to the internal or external portion of the leg, the temperature rapidly lowers. Edema of the feet occurs and sometimes it affects the entire leg. The symptoms may subside for a month and then, without provocation, the lesion reappears in the same place with all the accompanying symptoms. The course of the disease is chronic, the attacks recurring periodically for some years, with hardly any general disturbance or change in the appearance of the lesion, but each time the edema becomes greater and lasts longer. The form of the disease varies according to whether or not shoes are worn. In barefooted people cracks occur, becoming more numerous with every exacerbation, and the skin becomes first hard, then calloused and lastly cornified. In some cases the toes become atrophied, and in others the papillae hypertrophy, producing tumors. Among people who wear shoes there is nothing more than constant edema of the feet and the inferior portion of the leg, though in rare advanced cases the characteristic cracking occurs near the plantar surface. Of more than 150 cases examined, in only one had the edema extended to the groin; the scrotum simulated a filarial condition. The disease lasts for life, without spontaneous cure, nor have results been obtained from any of the many treatments experimented with apart from improvement with radiotherapy, potassium iodide and arsenic. Histological examination reveals only hyperplasia of the connective tissue and at times of the elastica. The prognosis with regard to life is benign. The affection appears to be distinct from all other tropical diseases.—[From abstract in *Bol. Of. sanit. Panamericana* 18 (1939) 982.]

COLLIER, D. R. The use of diathermy in leprosy. A preliminary report. *Thai Sci. Bull.* 2 (1940) 109-116.

The writer, with Oberdoerffer, who at that time was associated with him [at the Chiangmai leprosarium in Thailand (Siam)], on the basis of the latter's theory that the essential predisposing factor in leprosy is "adrenocortical insufficiency, enhanced by adreno-toxic sapotoxins from food plants," employed adrenal stimulation in the treatment of cases. This was effected by means of diathermy, one electrode being placed over the upper kidney region and the other over the lower ribs anteriorly. Treatments were given for fifteen

minutes twice a week to 33 patients who had been under routine chaulmoogra treatment for at least a year, most of whom had made no progress in the preceding half year. At the end of six months there was definite improvement, it is stated. Most of the patients were improved generally and had gained weight, and none showed any activity of the skin lesions; in six cases enlarged ulnar nerves had returned to normal size. At the beginning 18 had positive nasal smears, at the end only 2; positive skin-smear findings, however, had decreased only from 23 cases to 20. The most striking results were seen in the marked reduction of frequency of lepra reaction. In the previous six months 21 of these cases had had one or more reactions; in the treatment period only 9 had such disturbances and they were of diminished severity. Twelve patients who in the preceding period had had from 5 to 16 reactions each had none at all, and only one patient had more than one.

—H. W. W.

COLLIER, D. R. AND MCKEAN, J. H. The use of diphtheria antitoxin and toxoid in leprosy. A preliminary report. Thai Sci. Bull. 2 (1940) 117-125.

Encouraged by the results obtained with diathermy [see above] and in inoculation work with animals [see p. 549], Oberdoerffer and the authors decided to try the use of diphtheria antitoxin in treatment. It was thought that "there might be something more than an analogy between [the formation of] antibodies against a toxin such as diphtheria toxin, which essentially damages the adrenal, and the lack of such an attempt in leprosy." It was not expected that diphtheria antitoxin would cure leprosy, but that it might "neutralize leprosy toxin in the toxæmic syndrome in leprosy," i.e., lepra reaction. *Antitoxin*: A group of patients who were having repeated reactions were given injections [apparently 6,000 units] of this serum, with marked effects. There was access of fever during the first 24 hours, but after 3 or 4 days elevated lesions, when present, showed scaling and then shrinking, with change of color from red to dark brown. In the more acute cases central breaking down of nodules occurred. Bacilli showed marked granular degeneration. Not one of about 50 cases so treated failed to respond in this way. During the next few months most of the patients remained free from reactions and some showed marked improvement. Other cases were then treated with repeated smaller doses, as 2,000 units every 10 days, with encouraging results even in several nonreaction cases. Because a number of similar reaction cases given antitetanus and antivenom sera for controls showed no benefit, the beneficial effects are considered not ascribable to the nonspecific serum protein. *Toxoid*: Sixty other cases, plus 20 of the antitoxin group, were then injected with diphtheria toxoid (1 cc.). Nodular and other lesions in lepromatous cases underwent the changes described. In neural cases the effect was less apparent, but in 50% of them anesthetics and enlarged nerves improved within a month. Only 3 had failed to maintain the improvement at the end of two months. No harmful effects have been seen in either of these experiments. *Supplement*: In a mimeographed supplement prepared four months later it is stated that approximately 400 patients had been treated with toxoid, including about 200 outpatients in many of whom activity had ceased. Of the institution cases, most of the 170 who had then been treated for six months had received 4 or 5 injections (maximum of 10), beginning with 1 cc. and increasing by 0.5 cc. every 2 to 4

weeks. About 70% of them were of the lepromatous type. Improvement of the skin lesions were seen in 75% of the whole group, improvement in anesthetics in 41%; there was change to negative in 25% of those originally with positive smears, though 10% became worse in this respect. Five cases (3%) were clinically worse, but antitoxin was given them with apparently good effect.

—H. W. W.

MONACELLI, M. Nuovi tentativi di chimoterapia della lebbra. [New attempts in chemotherapy of leprosy.] *Riforma med.* (Napoli) 55 (1939) 460.

The author has reported the results obtained from chemotherapy in a group of cases at the leprosarium of Messina. The drug used was rubrophen (trimethyl-dioxy-oxotritan), a dye with which satisfactory results have previously been reported in the treatment of cutaneous and surgical tuberculosis. The effect on leprosy was favorable. The symptoms and general condition of the patients improved. Toxic phenomena were observed in some cases. —[From Foreign Letters, *Jour. American Med. Assoc.* 112 (1939) 2548.]

ETCHEVERRY, V. P. Las sales biliares en el tratamiento de la lepra. [Bile salts in treatment.] *Rev. Brasileira Leprol.* 7 (1939) 157-164.

The author has found that after injecting solutions of bile salts locally into lepromatous tissues there was a considerable reduction in their size, and he recommends employment of the procedure in therapy. For leprotic eye lesions he uses the solution in prolonged eye bathing and by subconjunctival injection. —[From author's summary.]

RADNA, R. Sur le traitement de la réaction lépreuse. [Treatment of lepra reaction.] *Ann. Soc. belge Med. trop.* 19 (1939) 227-233.

Seven cases of lepra reaction were treated by transfusion of blood from neural leprosy cases. Within 5 to 10 days the reaction was controlled, and the regular antileprosy treatment could be resumed without intolerance.

—A. DUBOIS

RADNA, R. Sur le traitement des lésions trophiques lépreuses. [On the treatment of the trophic lesions of leprosy.] *Ann. Soc. belge Med. trop.* 19 (1939) 65-71.

The author has treated the plantar ulcers which are so frequent in neural leprosy by injections of creosoted hydnocarpus oil around the ulcers and along the posterior tibial nerve, according to the method of Lowe and Chatterji. He also employs disinfection with permanganate and stase (Bier). The results have been satisfactory. Injections of the oil along nerves that are swollen and causing more or less marked acroteric lesions have also given satisfactory results.

—A. DUBOIS

ANDERSON, H. H., EMERSON, G. A. AND LEAKE, C. D. Chemotherapy of leprosy; clinical evaluation of antileprosy drugs. *Univ. California Pub., Pharmacol.* 1 (1938) 31-47.

The authors report that merthiolate demonstrates activity against the leprosy bacillus in the laboratory. When administered with chaulmoograte to 10 lepers in Panama, the nasal mucus became free of bacilli in 5 of them in a period of 7 to 24 months, against only 6 of 26 patients who received chaulmoogra only for more than two years. The glycerophosphate-dichaulmugril-

B-sodium ("chaulphosphate") aborted one case of 20 who had previously received intense treatment, and in 6 of 10 (in Brazil) who received the drug for nine months. Trials with this drug should be made in cases that have not previously received other antileprosy drugs. Merthiolate merits attention for cutaneous antiseptics and for the treatment of active cases of leprosy, if the renal function is adequate. Lipemia (505 to 857 mgm. %) can explain the positive seroreactions observed in leprosy, particularly those of early nature. —[From abstract in *Bol. Of. sanit. Panamericana* 18 (1938) 984.]

Khan { KAHN, J. S. Treatment of leprosy trophic ulcers. *Lep. in India* 11 (1939) 19-21.

A study of results of treatment of trophic ulcers shows that rest and protection from pressure are important factors, and that a plaster of Paris cast constitutes an excellent method of securing this. Preliminary removal of necrosed bone is considered advisable. After application, a window is cut in the plaster cast to facilitate dressings, but neither daily dressings nor confinement to bed is considered necessary. —J. LOWE

TUTTLE, G. B. Leprosy. *Jour. Missouri State Med. Assoc.* 37 (1940) 135-137.

A general description of leprosy based upon the author's service at the Kalaupapa Leper Settlement in Hawaii, from 1928 to 1939. During that period, in which a total of 502 patients were admitted, the number in the institution decreased from 496 to 356. One case of special interest is mentioned, a girl who was born of leprosy parents and who lived in the settlement nursery until leprosy was diagnosed, at the age of 18 months. The lesion was removed surgically, after which she lived with her parents in the settlement. For about seven or eight years she has been married to a patient with severe lepromatous leprosy. During the period that she was under the observation of the writer she showed no evidence or symptom of the disease. [This case is remarked on in a communication which appears in the Correspondence section of this issue.] —H. E. HASSELTINE

DOROFEEV, V. H. [Recession of the levator in paralytic lagophthalmos in lepers.] *Viestnik Ophth.* 14 (1939) 69.

A description of a procedure similar in principle to Golstein's operation. In six cases the results were satisfactory functionally and cosmetically. —[Abstract from *American Jour. Ophthal.* 22 (1939) 814.]

KAMIKAWA, Y. On the vasectomy in cases of lepers. *Japanese Jour. Dermat. & Urol.* 46 (1939) 44 (abstract).

The author, considering his own 17 cases of vasectomy and many others from the literature, concludes that this simple operation (excision about 1 cm. of the spermatic cord), performed for the purpose of birth control, has no influence on sexual desire. The excised spermatic cord usually showed no marked histological leprosy change, though some were found in specimens from severe cases.—[From abstract.]

RAI, S. Formosan tradition in the treatment of leprosy. *Japanese Jour. Dermat. & Urol.* 46 (1939) 44 (abstract).

The author discusses the traditions regarding the treatment of leprosy among the Formosans of earlier days, as learned from patients in the Rakusei leprosarium and from aged Formosan people of the intellectual class. In the past, and perhaps even now among some classes, the Formosans had

the superstition that a leper would be cured if he succeeded in transmitting the disease to another person. They also believed that the disease can be cured by eating wild duck which has been forcibly sickened by feeding it with maggots produced on rotten snakes, or by eating the mantis, rats, centipedes, frogs and moles. On the other hand, many foods are believed to accelerate the progress of the disease.—[From abstract.]

GOMES, J. M. Trez meses de tratamento da lepra pelo "Alfon." [Three months treatment of leprosy with Alfon.] Arch. Dermat. Syph. São Paulo 2 (1938) 147-166; reprinted, in English translation, São Paulo, 1939, 37 pp.

This is a preliminary note on therapeutic use in human leprosy of the carotinoid (provitamin A) preparation of Fonseca Ribeiro [see THE JOURNAL 8 (1940) 179]. The material is put up in 1% colloidal suspension in saline. Intramuscular injections of 5 cc. were given three times a week at first, later daily, with a rest of 10 days after 30 injections. Of the 332 patients put under this treatment in the Santo Angelo leprosarium [at this time], two-thirds could not tolerate chaulmoogra because of prolonged reactions. The results reported are of the primary effects, but it is stated that the author has not seen any other drug produce such remarkable effects in so little time. In the first week or two there occur extensive erythemas, multiform or nodular, and then increase of temperature and shivering, with eruptions of short duration in old lesions or new areas. These reactions are considered favorable if not too severe. The author speaks of massive elimination of bacilli, and some of the cases had already become bacteriologically negative. Women, it is stated, retain carotene better than men, in whom therapeutic effects appear only after the drug has accumulated. The drug is not toxic, but patients who took more than was prescribed soon showed excessive reaction and loss of weight. Cases with cardio-renal insufficiency or severe respiratory or hepatic affections, and those of advanced age are not suitable, and care must be used in the presence of ocular lesions. —H. W. W.

GOMES, J. M. New therapeutics of leprosy. (English translation of paper read in Bello Horizonte, May 27th, 1939.) São Paulo, 1939, 19 pp.

—New therapeutics of leprosy. Twelve months treatment of leprosy with "Alfon." Rev. Med. Brasileira (1939) Oct.; English translation, São Paulo, 1939, 95 pp.

(1) The first paper under this title reviews the work that led to the trial of carotene in treatment, with little concerning the results of that experiment which did not appear in the author's earlier paper [see above].

(2) This report, all but 21 pages of which are devoted to tabulations and selected case histories, records the experience of a full year's work with this treatment. About 400 patients had received it, it is stated, plus some hundreds who took the place of others who had been forced to give it up. The general reactions with fever are to be avoided by dosages that do not promote general destruction of the germs. On the other hand the focal reactions, which usually occur in the skin and nerve lesions, and which vary in intensity according to the quantity of the germ present, are regarded as the consequence of pharmaco-dynamic reactions and useful and indispensable. In general four phases of developments are recognized: (1) That of cuta-

neous activity, with among other things of appearance of new macules or nodules—defensive action to isolate or eliminate the infectious element. (2) That of cutaneous excitation, with rupture of recently formed nodules and ulceration—phase of elimination—which leaves the patient in a generally improved condition. (3) That of appearance of superficial macules resulting from the previous phenomena, and of scaling—phase of decline. (4) That in which there remain only scars and perhaps trophic ulcers—stationary period, of apparent cure. The morphology of the bacillus varies with the period, there being successively increased granulation, breaking up, and lessening of staining capacity; the numbers continually diminish and in some cases they disappear.

—H. W. W.

DE MOURA, A. M. O caroteno no tratamento da lepra. [Carotene in the treatment of leprosy.] *Rev. Med. Paraná* 8 (1939) 113-118; reprinted in English translation, São Paulo, 1940, 12 pp.

The author, after observing the work of Gomes, employed the carotene of Fonseca Ribeiro at the São Roque leprosarium, Paraná, in about 140 cases. Most of them were intolerant to chaulmoogra and subject to repeated attacks of lepra reaction; tuberculoid cases were not included because they respond so well to chaulmoogra drugs. The intramuscular route was used after trial of the subcutaneous and intradermal routes. No conclusions are drawn, as the work had continued for only five months, but detrimental and advantageous features are pointed out. The contraindications are as noted by Gomes [see above]. Some patients experienced repeated reactions and aggravation of their lesions, and the treatment of others had to be modified or interrupted because of fever and loss of weight. Many, on the other hand, stood the treatment well and showed improvement of their general condition and of the disease. Local reactions and the bacterial changes are as described by Gomes. Many cases presented fairly generalized adenopathies, and diarrhea and liver disturbance often necessitated temporary suspension of the treatment, but the aspect of the lesions improved in the intervals between reactions.

—H. W. W.

PINTO LIPPELT, A. AND MENDONÇA DE BARROS, J. O "Alfon" no tratamento da lepra. ["Alfon" in the treatment of leprosy.] *Rev. Brasileira Leprol.* 8 (1940) 45-51.

The authors report briefly, with a tabulation of cases, their experience with the treatment of 30 lepromatous cases at the Padre Bento leprosarium with this preparation. It was used as specified in the accompanying directions, the total amounts given over a period of several months varying from 250 to 1,050 cc. A majority of the patients who tried this treatment abandoned it of their own accord, judging it to be inefficient. It is concluded that, from the dermatological point of view, the drug did not impede the progress of the lepromatous lesions and caused absolutely no retrogressive changes. Regarding the ophthalmological condition, there were serious effects in acute diffuse iritis, leading to the appearance of lesions of lepromatous nature and notable aggravation of the diffuse infiltrations of the cornea, with no benefit to any of the ocular complications of the disease.

—H. W. W.

[The controversy that has arisen in connection with the work of Gomes, reported in the articles abstracted above, has been given cognizance edito-

rially and otherwise in a recent issue of *Leprosy Review*. The situation as there presented is discussed in an editorial note in this issue.—EDITOR.]

CONCEPCION, I., CAMARA, S. F. AND FULGENCIO, B. Studies on vitamin C. VI. The blood ascorbic acid in leprosy. Jour. Philippine Islands Med. Assoc. 19 (1939) 733-740.

Examinations for ascorbic acid content of blood, (Pijoan and Eddy method) were made on 94 leprosy patients, 78 males and 16 females. The low values found, one-half of normal, indicate that two factors are responsible: the disease itself and deficiency of vitamin C in the diet. With advance of the disease there is a gradual corresponding decrease of vitamin C in both plasma and corpuscles. The differences between slightly and markedly advanced cases, studied statistically, was significant only for the plasma, not for the corpuscles. Between bacteriologically positive and negative male lepers the difference was statistically significant in favor of the negative cases in the plasma, but not in the corpuscles. The response of patients to daily intramuscular injection of 50 mg. ascorbic acid for one week was an average increase of 45% in the plasma and 30.5% in the corpuscles, whereas among normal controls the increase was only 11% in the plasma and 4% in the corpuscles, which was contrary to expectations. These results are interpreted as indicating that the lower the initial level, the greater the response to administration of ascorbic acid.

—J. O. NOLASCO

YANO, M. AND GAMO, I. Ueber den Vitamin C-Gehalt in der Zerebrospinalflüssigkeit der Leprösen. [The vitamin C content of the cerebro-spinal fluid in leprosy.] La Lepro 10 (1939), suppl. 89 (abstract).

This matter has been investigated in 41 cases (9 nodular, 14 neural and 18 macular) by the 2,6-dichlorophenolindophenol method. The findings varied, but the amount was more or less clearly diminished in most of the nodular cases. In early and slight cases it was in general quite normal, in progressive and stationary cases it was only slightly diminished, but it was more clearly so in the progressive and florid ones. There was, however, no definite relation with the duration of the disease.—[From abstract.]

RADNA, R. Sur la teneur en calcium de sérum des indigènes du Congo Belge. [On the calcium content of the serum of natives of the Belgian Congo.] Ann. Soc. belge Med. trop. 19 (1939) 61-63.

Using the method of Krammer and Tisdall, the author has ascertained that the "normal" Negroes do not have hypocalcemia (100.3 mgm. per thousand). Among lepers only those with the lepromatous form of the disease, or those in reaction, have some degree of hypocalcemia. This condition is in relation with anemia and concomitant cachexia, because it occurs in other diseases with cachexia.

—A. DUBOIS

RADNA, R. Sur la lipase du serum des lépreux. [On the serum lipase of lepers.] Ann. Soc. belge Med. trop. 19 (1939) 55-59.

This is a second report on this subject. In the first one [see THE JOURNAL 7 (1939) 115], the author reported low serum lipase in serious cases (average 0.00117 against 0.0023 in moderately severe cases, and 0.00457 in cases ameliorated by treatment) and concluded that this determination is of prognostic value. In the present study, made on 59 cases, it was found that the average lipase value in L-type cases is low, while in N-type cases

it is normal; but it is added that the findings depend less on the type of case than on the general condition of the patient. Leprosy reaction causes a reduction, and cachexia of nonleprosy origin (as helminthiasis) may cause as much diminution as a change of the general condition due to leprosy.

—A. DUBOIS

HASEGAWA, K. Ueber die Nebenniere bei Lepra. I. Mitteilung. Ueber den Adrenalingehalt der Nebenniere bei Lepra. [The adrenal in leprosy. I. The adrenalin content.] *La Lepro* 10 (1939) suppl. 19 (abstract).

The adrenalin content of the adrenals has been determined in 174 autopsy cases, 133 male and 41 female, selected from 198 adult cases (ages 15 to 70 years) because of the absence of complications; the organs were removed from 8 to 30 hours after death. The 348 adrenals so obtained were examined by the Sudo-Inoue colorimetric method. The average adrenalin content in the male cases was found to be 2.693 mgm. ± 0.632 , and in the female cases 2.11 mgm. ± 1.84 . In most instances it ranged between 1.5 and 3.0 mgm.; the lowest figure was 0.0, the highest 7.0 mgm. There is here a striking difference—about one-half less—from the findings in healthy Japanese. In general the amount present is less in nodular leprosy than in the other forms; in the macular form, indeed, it is as high as normal. There is no relation with season, with age or body weight of the patient, or size or weight of the organs. It is believed, however, that there exists a close relation with the symptoms, frequently observed in leprosy, of hypoglycerina, hypotonia, vagotonia, sympathiconia and pigmentation of the skin.—[From abstract.]

TATIKAWA, N. Ueber den Körperbau der Leprösen. (I. Mitteilung, besonders über den Körperbau von leprösen Kindern.) [The body structure of lepers; 1st report, with special reference to the body structure of leprosy children.] *Japanese Jour. Dermat. & Urol.* 45 (1939) 35 (abstract).

In 78 leprosy children the height and weight were in general less than in healthy children, but the circumference of the chest varied. The ratio of weight to length was greater in children with nodular leprosy than in those with the neural form. The ratio of height to chest circumference was less in those with the nodular than with the neural form.—[From abstract.]

RYRIE, G. A. Hydnocarpus soap. *Lep. Rev.* 10 (1939) 120.

A method of making hydnocarpus soap is described. Sodium hydroxide is boiled in water and allowed to cool. Hydnocarpus oil is then added and mixed well, the mixture then put into moulds and allowed to harden. For every 100 gms. of sodium hydroxide, 300 gms. of water and 700 gms. of oil are used.—[From abstract in *Lep. in India* 11 (1939) 106.]

JINGU, R. Ueber die Grösse und das Gewicht einiger Organe bei Lepra-kranken. [The size and weight of certain organs in lepers.] *Japanese Jour. Dermat. & Urol.* 43 (1938) 83 (abstract).

The brain is somewhat lighter in lepers than in nonlepers, heavier in nodular than in neural or macular cases. The heart in the neural and macular cases is of normal weight, lighter in nodular cases. The liver is somewhat heavier in nodular than in other cases, but on the whole there is no special difference between leprosy and nonleprosy individuals in this respect.

The spleen in nodular cases is larger and heavier than in neural, and considerably heavier than in nonlepers. The kidney does not differ in the different types as regards size or weight, but in lepers in general it is much larger and heavier than in nonlepers.—[From abstract.]

COWDRY, E. V. Cytology of leprosy. *Puerto Rico Jour. Pub. Health & Trop. Med.* 14 (1938) 95-117.

The author, whose study of leprosy resulted from an extension of his interest in the rickettsial infections in which the causal organisms also affect the endothelial or reticulo-endothelial cells of the host, reviews in this DeLamar lecture, delivered at Johns Hopkins University, several of the interesting problems of the disease. The scope of these questions, which are discussed under thirteen headings, departs widely from the indicated topic. In that connection he criticises the idea that only monocytes (macrophages) are concerned in leprosy lesions, though he does not deny that they predominate in the picture; mainly he speculates on a possible if temporary role of neutrophils. The questions of relation between the reacting cells and bacilli, the influence of the latter upon the former, the formation of globi, and the consequences of the "disease reactions" are discussed at some length, with emphasis on what is not known. This discussion is hardly susceptible to summarization.

—H. W. W.

BERTACCINI, J. Pathogénie de l'alopecie sourcifiere des lépreux. [The pathogenesis of alopecia of the eyebrows.] *Ann. Dermat. et Syphil.* 10 (1939) 286-315.

Pointing out the rarity of affection of the eyebrows in other diseases than leprosy, and the remarkable difference of frequency of that affection and of alopecia of the scalp in most countries (he saw the latter in only two well marked cases of the latter in more than 100 patients in Italy, whereas the eyebrows were affected in most of them), the author proceeds to discuss in detail the etiology of the condition. Two factors are usually cited: (a) the existence of lepromatous infiltration and (b), when evident skin lesions are absent, a trophic disturbance. From the findings in biopsy specimens from 20 cases of various kinds it is concluded that when the eyebrow is affected in any degree a characteristic infiltration with abundant bacilli is to be found, even when the skin seems entirely normal, and that the alopecia is in all probability a direct effect of that condition. In nodular leprosy this affection may be very precocious and of significance in diagnosis. In neural and maculo-anesthetic leprosy it is much less frequent, and when present the infiltration in the tissue is generally more discrete and less characteristic, and bacilli are rare. A special study of the nerve fibers in this tissue usually showed degenerative changes that did not seem to have any relation to the alopecia.

—H. W. W.

SATO, S. Zur morphologischen Studie der Schweissdrüsen bei Lepra. [Morphologic study of the sweat glands in leprosy.] *Japanese Jour. Dermat. & Urol.* 43 (1938) 107 (abstract).

The changes of the sweat glands in neural leprosy are especially interesting. As is known, skin which from all appearances is normal, showing only slight sensory disturbances, may show decrease or even suppression of the sweat secretion. In such skin is found atrophy of the sweat glands, but

as a rule no inflammatory infiltration. The nuclei and cell bodies of the glandular epithelium become smaller and more deeply staining. The lumens of the glands become narrow, then occluded, finally disappearing entirely; and in deep layers fragments of atrophied glands may be found. On the contrary the excretory ducts are generally widened, though there is condensation of the cells. Though these changes are prominent, the subpapillary layer appears almost unchanged, and at most contains only slight cellular infiltration. The findings in vitiligo leprosa are almost the same. In macular leprosy the cellular infiltration tends to appear first around the sweat glands, atrophy of which occurs relatively early, the infiltration replacing them. Their excretory ducts, however, are resistant and remain for a long time, but in an atrophic condition. In the rapidly developing reaction forms of these lesions the infiltration causes rapid destruction of the glands. In cases of the so-called tuberculoid change the destruction of the sweat glands proceeds more slowly, and frequently the glands or their excretory ducts are clogged with masses that stain pale red with eosin and that on cross section frequently present the picture of the Langhans giant cell. Bacilli are very difficult to find in them. Globular, acid-fast bodies, 1-2 microns in diameter, are frequently found in the cells of the sweat glands, usually grouped near the nuclei, but these may also be found in materia from nonleprous persons. —[From abstract.]

TOMINAGA, B., ISHIKAWA, M. AND YAMAMOTO, M. Ueber Veränderungen an den feineren Nervenfasern in den Leprösen effloreszenzen, die sich bei Anwendung einer neuen Modifikationsmethode der Cajal'schen Silberimpregnation der Nervenfasern ergeben. [Changes of the finer nerve fibers in the leprous lesions as shown by a new modification of the Cajal silver impregnation method.] *La Lepro* 10 (1939) suppl. 97 (abstract).

In leprous lesions the nerve fibrils show moderately marked changes, consisting of swelling, circumscribed enlargements, fragmentation, degeneration and diminution, to the point of suppression, of the silver impregnation. Numerous bacilli are demonstrated by silver impregnation, especially in the centers of the nodules. In macules the nerve-fiber changes were almost the same as in the nodules, but of lesser degree. Circumscribed swelling was not observed, and bacilli were not demonstrated.—[From abstract.]

SUZUKI, R. Ueber die Färbung der Leprabazillen in den im Paraffin eingebetteten Schnittpräparaten, nebst über eine einfache Herstellungsmethode der Paraffinschnitte. [The staining of leprosy bacilli in paraffin sections, and a simple method of preparation of paraffin sections.] *La Lepro* 10 (1939) suppl. 91 (abstract).

The acid-fast staining methods employed with good results with other materials have disadvantages with leprous tissue. The author, having long endeavored to arrive at the best possible method of staining and differentiating the bacilli, gives the following technique: (a) carbol-fuchsin, 1 hour in the incubator; (b) decolorize with 5% sulphuric, without alcohol; (c) dehydration in the air. For cutting sections [a sliding microtome used, the knife blade therefore horizontal] a drop of water of the size of a pea is laid on the edge of the knife at the point that will do the cutting. The section

enters the water as it leaves the block, and in this way it is easy to prepare very thin sections, even 1 to 3 microns in series.—[From author's summary.]

BOSCO, I. AND TAGLIAVIA, B. Studio seriato istologico del midollo spinale in un caso di lepra nervosa deformante a vaste lesioni periferiche. [Serial histological study of the spinal cord in a case of deforming neural leprosy with marked peripheral lesions.] *Riforma med.* 55 (1939) 461.

The authors present the results of a serial histological study of the spinal cord of a case of deforming neural leprosy with marked peripheral lesions. They believe that the lesions provoked by the Hansen bacilli are in the beginning mostly peripheral and that later, and slowly, they cause central medullary changes of ascending type. These lesions are mostly the expression of an ascending secondary degenerative process, not of central propagation of the infection.—[From abstract in *Rev. Brasileira Leprol.* 7 (1939) 231.]

BOSQ, P. AND IGLESIA, M. Frecuencia y circunstancias en las cuales los bacilos de Hansen atraviesan espontaneamente la epidermis intacta de los enfermos. [Frequency and circumstances in which the Hansen bacilli traverse the intact epidermis.] *Rev. Argentina Dermatosif.* 24 (1940) 207-211.

The authors found that in 6.7% of lepers with advanced forms of the disease the bacillus may be found on the surface of the intact skin. In cases of lepra reaction the frequency runs as high as 33%. —G. BASOMBRI

SUWO, M., ITHARA, T., TAKEUTI, T. AND, OSAKA, S. Study of leprosy. II. Report. On acid-fast bacilli in the nostrils of lepers. *La Lepro* 10 (1939) suppl. 1 (abstract).

Reporting further on this matter, which Suwo et al. first studied with respect to healthy persons [see *THE JOURNAL* 8 (1940) 414], the authors deal with their findings in 110 persons with leprosy. Using the cultural method, they obtained positive results as follows:

Type	Number	Positive	Percent
L. tuberosa	40	4	10.0
L. nervosa	39	8	21.0
L. maculosa	31	3	9.7
Total	110	15	13.6

The isolated bacilli differ from each other, and some of them very much resemble those that were isolated from the healthy group. It is reiterated that it is necessary to consider the presence of such organisms in making diagnoses of leprosy on the basis of the examination of nasal smears.—[From authors' abstract.]

RADNA, R. Sur la bacillurie des lépreux. [On bacilluria in leprosy.] *Ann. Soc. belge Med. trop.* 19 (1939) 51-53.

The injection of "rhodarsan" (914) may determine in lepromatous patients a bacilluria of leprosy bacilli, occurring usually 24 hours after the injection and sometimes lasting for 5 days. This fact has to be taken into account in connection with prophylaxis when it is necessary to treat a leper with this drug, for syphilis, yaws, etc. —A. DUBOIS

COLLIER, D. R. Inoculation of monkeys with leprosy, following a diet of puak (*Colocasia*). Thai Sci. Bull. 2 (1940) 101-108.

Following the ideas of Oberdoerffer [see p. 538], the author undertook an inoculation experiment with monkeys—the ordinary long-tailed brown *Rhesus* native to the country—fed chiefly on *puak* (*Iaro*). The tubers were given boiled, as they were rejected when raw. Starting with two animals, the number had been increased to 30 at the time of the report, but in most of them the experimental period had been too short for results to be evident; only 12 are referred to specifically, four of them controls not given the colocasia diet. Four of the animals whose postinoculation period was six months or more had developed "symptoms similar to those seen in leprosy in humans"; a fifth one, similarly treated, remained negative. Another one, which was given injections of a sapotoxin from colocasia as well as that vegetable for food, developed abscesses containing acid-fast bacilli as well as other symptoms. The following is taken from the notes on the more interesting animals.

No. 1: Diet started September 1st, 1938. On October 1st a piece of a leproma was inserted under the skin of the back. In six weeks there developed inflammation of the face, palms and soles; face deep red, somewhat swollen and infiltrated; inoculation lump more than doubled in size. This "reaction" subsided after about a month but the thickening and redness of the face remained; since then it has been highly inflamed at times and has never returned to normal. On March 1st, 1939, a smear from the nodule on the back showed typical acid-fast bacilli. Animal reinoculated on April 17th. Ear clips on May 20th and 30th negative, but a nasal smear was positive on the latter date and repeatedly thereafter. On July 24th an ear clip was positive, and this part has remained so ever since. In October, a year after the first inoculation, a diffusely swollen area of deep red coloration appeared across the back to the level of the lumbar vertebrae; smears negative. Ears, and also nipples, red and definitely enlarged.

No. 3: Inoculated December 15th, 1938; reinoculated April 17th, 1939. On June 23rd and September 27th nasal smears positive; ear clip negative. In September the face around the eyes became intensely red and indurated. This condition, which has persisted, has not been noted in any of the control monkeys.

No. 7: Inoculations as with No. 3 having resulted in no skin changes, a third one was made on August 4th. An abscess formed locally; smears showed extremely numerous acid-fast bacilli. This lesion healed spontaneously within 9 days. On September 27th there was found on the opposite side of the back a large, soft, fluctuating mass, 1×0.75 inches, from which was aspirated a purulent fluid which contained acid-fast bacilli. The mass remained indurated and has persisted. Similar though smaller masses occurred on both wrists. There has been loss of hair on the back and tail. Face unchanged, but the nasal smear has been positive. On November 1st ulnar nerves found enlarged.

No. 11: Inoculated as usual August 5th, beginning September 14th this animal was given a number of injections of sapotoxin prepared from colocasia. By October 1st there was on the opposite side of the back a mass which by November 1st measured approximately 1×0.75 inches and that contained acid-fast bacilli. A second mass, also containing such bacilli, has appeared below the first one. Eye-brows thickened and somewhat reddish, with indications of paresthesia around the eye. Loss of hair over back and tail. Highly interesting photographs of some of these animals are reproduced.

Rabbits, guinea-pigs and ordinary pigs have also been experimented with; one of the last developed a leprosy lump. [In correspondence the author states that the animals have continued to develop new lesions.] —H. W. W.

FERNÁNDEZ, J. M. M. El valor del laboratorio en el diagnóstico de la lepra.

[The importance of the laboratory in the diagnosis of leprosy.] Rev.

Centro Estud. Fac. Cien. Méd. Farm. etc. 20 (1940) 10-16.

The author discusses the routine laboratory methods in the diagnosis of leprosy, including the technique and the importance of the results of the bacteriological examination of the nasal mucosa, skin, lymph nodes, nerve trunks, blood, etc. The Mitsuda reaction merits special attention, also the subcutaneous injection of lepromin, which constantly produces local, general and focal reactions in the tuberculoid forms of the disease but not in lepromatous form. The histamine test is regarded as useful to elucidate the type of disturbance of sensibility, central or peripheral, and is at times very useful in the diagnosis of leprosy. The histopathology of the different forms of leprosy is presented briefly.

—G. BASOMBRIO

NONAKA, N. Infection experiments of lepra with chickens. Kitasato Arch.

Exper. Med. 16 (1939) 9 (abstract).

When human leproma material was inoculated into chickens leprosy granulations were produced at the sites. The lesions, seen within 24 hours, consisted of small nodules with many organisms. Nodular formations were also seen in the liver and spleen, and in some cases the organisms were found in them, though they were not as numerous as at the site of inoculation. When heated inocula were used the leprosy changes were localized and no change was seen in the other viscera. When a filtrate (Berkefeld V) of a leprosy emulsion was inoculated no leprosy changes or organisms were found anywhere. More marked lesions at the site of the inoculation, but none in the viscera, were caused by an emulsion of rat leprosy tissue; the organisms which had been in the tissues of the chicken for more than one week no longer infected white rats. Heated emulsions produced only a mild localized change at the site and none in the viscera. When nonpathogenic acid-fast organisms were inoculated into chickens there was produced a granulation tissue resembling the leprosy one, but histologically it was entirely different, more like pseudo-tuberculosis; and no change was found in the other viscera.—[From abstract.]

SUZUKI, R. Ueber die Impfung von Tieren mit Leprabazillen. [On the inoculation of animals with the leprosy bacillus.] Tohoku Jour. Exp.

Med. 36 (1939) 146-152.

The author relates [what has not been seen elsewhere] that Takagi, Yasuda, Hukusima and others have reported infection, by intra-abdominal implantation of pieces of human leprosy nodules, of mice which had been previously treated with the venom of *Trimerurus riukiuanus*, a poisonous snake of the Liukiu Islands. The venom gave far better results than did benzidin, olive oil, etc. The infected animals became very thin, with loss of hair, and they showed under the skin, and in the pleura, peritoneum, omentum, liver, spleen and lungs, one or several small nodules in which innumerable acid-fast bacilli were found. The newly-formed nodules are said to be very similar to the leprosy tissue in man. A small nodule obtained from one organ could not be transplanted for more than two generations, but that could be done with an isolated subcutaneous nodule. Planning to undertake

some such experimentation, the author considered the fact that mice in his institution (the Hokubu-Hoyoin, at Aomori) showed an exceptionally high mortality and never became pregnant. This was found to be due to their food, composed of buckwheat grits (*Fagopyrum esculentum* Monech) and raw potatoes. Numerous mice on this deficient diet were inoculated by intra-abdominal implantation of leproma fragments (5 mm.). Those that survived that long were reinoculated on the 77th day. In summary, it was found that the inoculated fragments' degenerated and bacilli were found to have multiplied in the swollen tissue that surrounded them. In no instance, however, were either lepromatous foci or bacilli found in the visceral organs.—H. W. W.

RABELLO, JR. AND VILLELA, G. Utilização de uma substancia antigenica extraida do leproma no diagnostico da lepra. [Use of an antigenic substance extracted from the leproma in the diagnosis of leprosy.] Rev. Brasileira Leprol. 6 (1938) Spec. No., pp. 231-232.

This is a brief restatement of work reported in two papers presented at the Cairo congress [see THE JOURNAL 6 (1938) 462]. The reactions produced by the active (nonlipoid) fraction agree with those produced by the regular Mitsuda antigen, being of similar delayed type. No such reactions occur after injection of a similar extract of normal skin. —H. W. W.

RABELLO, JR., VILLELA, G. G. AND TOSTES, J. Recherches sur la fraction antigenique spécifique de l'antigène lépromateux de Mitsuda. [Study of the specific antigenic fraction of the lepromatous antigen of Mitsuda.] Bull. Soc. française Dermat. Syph. 46 (1939) 1386-1387.

Since the first reports on this subject, it is stated, the chemical technique has been improved and the reactions obtained are clearer, but nothing new appears in this article. An advantage is seen in the possibility of arriving at a chemically definite "standard" product. —H. W. W.

VILLELA, G. G. Sur la fraction active de l'antigène de Mitsuda. [On the active fraction of the Mitsuda antigen.] Bull. Soc. française Dermat. Syph. 46 (1939) 1387-1388.

This note would appear to be a further contribution to the subject dealt with in a paper sent to the Cairo congress. The lipid extracts of lepromin proved to be inactive, the residue active. Ground leproma, boiled in distilled water, is extracted with petroleum ether and an ether-alcohol mixture is added to the aqueous phase. The precipitate is washed with ether, dried, and dissolved in 0.1 N sodium hydroxide, then reduced to pH 7.8; 0.5% phenol is added and the solution sterilized. This antigen is active in 0.1 cc. doses. Similar extracts of normal skin from lepromatous cases or from nonlepromatous subjects is inactive, as are, it is stated, lepromas of rat leprosy. Fractions obtained by precipitation with acetone, or with trichloroacetic or tungstic acids, are not better than the one described. The active fraction is apparently of protein nature, containing N, S and P. The leproma used must be fresh, as autolysis destroys its antigenic property. —H. W. W.

MENDES, E. AND DE CASTRO CERQUEIRA, G. Estudos experimentais sobre a lepromina. [Experimental studies on lepromin.] Rev. Brasileira Leprol. 7 (1939) 245-293.

The authors begin this report [a long one, with 47 tabulations] by calling attention to the fact that the lepromin reaction is described both as one

... immunity and of immunity. Supported by the experiences of Hamburger and others, they conclude that the phenomena of hypersensibility and of acquired immunity have the same mechanism of reaction. In their opinion the size that a reaction lesion should have in order to be regarded as positive should not be deduced solely from the reactions observed in patients with neural or tuberculoid leprosy, or in healthy individuals in contact with lepers. From their study they conclude: (1) That lepromin consists of two portions, liquid and solid, dissociable by the Seitz filter. Since the solid portion is responsible for the reactions, the bacillus playing a preponderant rôle, lepromin should be standardized; mistakes occur in interpreting reactions when untitrated lepromin is used. The comparative method (described) is best for this purpose; a standard of 300,000 bacilli per cc. has been adopted. The more the test material is diluted, the less is the diameter of the reaction lesion in healthy persons; none are provoked by dilutions above 1:30. (2) That the diameter of the reaction lesion varies according to the region inoculated. In nonleprous persons equal volumes of lepromin injected in different places cause reactions varying up to 5 mm.; furthermore, the reactions are not alike as regards their morphological type, duration, and time of appearance. In leprous individuals similarly injected the variations are more marked; one may even find a strongly positive reaction in one region and negative ones in others. From control tests with tuberculin and Frei's antigen, it appears that the diversity of reactions is not due to local trophic disturbances but to immunobiological processes. Patients with tuberculoid leprosy tested with lepromin present much less intense reactions, sometimes negative ones, at the peripheries of the lesions, and in general the reactions are negative in bacteriologically positive lesions. On the other hand macules sometimes show stronger reactions than apparently healthy areas. Thus, the intensity of reactions being not entirely conditioned by the lepromin, but also by regional differences of reactivity, it is suggested that lepromin should be used to demonstrate the local grades of immunity in the same individual. —[From authors' summary.]

TACHIKAWA, N. The histological figures of two cases of tuberculoid maculae caused by skin test (Mitsuda's reaction). *La Lepro* 10 (1939) suppl. 55 (abstract).

This report is based on the symptoms and diagnosis of a typical tuberculoid macular case. The principal features are: distinct thickening of local cutaneous nerves, a high degree of lymphocytosis in the blood, strongly positive Mitsuda reaction, and histological similarity of the lesion to tuberculosis. Papules caused by the Mitsuda reaction in two cases, one tuberculoid and the other ordinary neural, are both quite similar histologically to the tuberculoid macule itself. Mitsuda and his school believe that the tuberculoid macular condition is a reaction caused by the leprosy bacillus, and that the positive skin test reveals the existence of bodily resistance against the bacillus. —[From author's abstract.]

MIWA, T. The skin reactions of lepra patients and their histological changes. *Kitasato Arch. Exper. Med.* 16 (1939) 10 (abstract).

The Mantoux tuberculin skin reaction in 50 lepers were 100% positive with a 1:1,000 dilution, 60% with 1:10,000. With a sterile filtrate of an emulsion of human leproma, 10% were positive after four hours, all nega-

tive after 24 hours. With a similar filtrate of a rat-leprosy leproma 38% were positive after 48 hours, the reactions gradually fading thereafter so that in 8 days no reading could be made; a majority of the negatively reacting cases were of the nodular type. Unfiltered emulsion of human nodules gave 43% positives on the eighth day, unfiltered rat nodules gave 90%. Histological specimens of the reaction sites showed in all the cases infiltrations of small round cells centering around the sweat glands. When unfiltered emulsion was inoculated many polymorphonuclear leucocytes were enmassed, with indications of abscess formation.—[From abstract.]

BALISA, P. L., JACHESKY, L. J. AND BASOMBRIO, G. La reacción de Chediak en la lepra. Observaciones personales. [The Chediak reaction in leprosy; personal observations.] *Rev. Argentina Dermatosis.* 24 (1940) 205-206.

The authors have studied the sera of 29 lepers in which there was no suspicion of the existence of syphilis. In 23 lepromatous cases the Chediak reaction was constantly negative. In 6 of the same cases the Wassermann and standard Kahn reactions were positive; in 2 the Wassermann was negative but the Kahn positive; in 2 others the Kahn was abnormal although only of doubtful grade. The remaining 6 cases of the 29 examined were of the tuberculoid or maculo-anesthetic forms; all serologic reactions, including the microreaction of Chediak, were negative. —G. BASOMBRIO

TANIMURA, T. AND YANO, M. Ueber die Takadasche Reaktion bei Lepra, insbesondere über die Beziehungen zwischen dieser Reaktion und dem Jodsaurewert. [On the Takada reaction in leprosy, especially on the relation between it and the iodic acid value.] *Japanese Jour. Dermat. & Urol.* 46 (1939) 38 (abstract).

The Takada reaction, Jetzler modification, was applied in 94 cases of leprosy, with positive results as follows: neural leprosy, 29 of 34 cases (85%); macular leprosy, 33 of 39 cases (85%); nodular leprosy, 20 of 21 cases (95%); total, 82 of 94 cases (87%). The iodic acid value of the serum of the same cases was tested by the Chikano-Nishigaki method. In the neural and macular cases it was normal (average 0.136 mgm.%), whereas in nodular cases it was generally somewhat increased (average 0.167 mgm.%; over 0.160 in 81% of these cases and over 0.170 in 57%). No special relationship was found between the Takada reaction and the iodic acid value in the sera of the individual cases.—[From abstract.]

KAWASAKI, S. Ueber die serochemische Reaktion mit dem Antigen der saurefesten Bazillen bei Lepra. [Serochemical reaction in leprosy with antigens of acid-fast bacilli.] *La Lepro* 10 (1939) suppl. 99 (abstract).

The author has experimented with various acid-fast bacilli to determine if they can be employed as antigens in the MHH reaction. The results [tabulated] show that such antigens may give positive reactions with leprosy sera, and also—though usually in lower percentages—with those of nonlepers. Those prepared from the human type of tubercle bacillus and from the Nisi and Tanaka strains of the organisms isolated from human leprosy gave the highest percentages of reactions; one made from the rat leprosy bacillus was less effective. —[From author's abstract.]

SATO, Y. Rattenlepra. V. Teil; Therapeutischer Einfluss verschiedener Medikamente auf die Rattenlepra. [Rat leprosy. V. Therapeutic influence of different medicaments.] Japanese Jour. Dermat. & Urol. 43 (1938) 71-72 (abstract).

Chaulmoogra oil, a bacillary suspension of rat leproma, and salvarsan showed relatively good, although only temporary, effects upon the process of the disease. Under their influence the leprosy granuloma developed more slowly than usual or retrogressed. In several cases abscess formation and ulceration occurred in the lesions produced by the inoculations, and after the ulcers discharged they soon showed fresh, healthy granulation. However, in no case was complete cure effected. Chaulmoogra ethyl esters, triphal, phenylthioethane and other medicaments showed no curative effect at all. The author has never succeeded, through early treatment with the above-mentioned medicaments, in preventing the advance of an infection or in achieving the eventual delay of the outbreak of symptoms. The treatment had no injurious secondary effect upon either the diseased or control animals.—[From abstract.]

ITIHARA, T. Studien über die Rattenlepra. Statistische Beobachtungen über die Rattenlepra. [Studies on rat leprosy; statistical observations.] La Lepro 10 (1939) suppl. 95 (abstract).

Among 263 rats (*Mus decumanus*) caught in the dwellings of inmates of the Shorokuto leprosarium, Korea, 17 (6.6%) were found to have rat leprosy—3 of the musculo-cutaneous form and 14 of the glandular form, males predominating. It would seem that there is no important difference between the geographic distribution of the rat and human diseases.—[From abstract.]

DHARMENDRA AND MUKHERJI, N. N. Action of methylene blue on *Mycobacterium leprae muris*. Indian Jour. Med. Res. 27 (1940) 627-630.

It has been found that, in vitro, methylene blue has no attenuating effect on the rat leprosy bacillus (confirming Berny's findings on this point), and in vivo has no degenerating action on the organism and does not in any way change its morphology or staining properties. Even repeated injections of the dye have no effect in this respect. The findings of Marchoux and Chorine in this connection have therefore not been confirmed.

—[From authors' summary.]

ABSTRACTS OF PAPERS ON LEPROSY PRESENTED AT THE
SIXTH PACIFIC SCIENCE CONGRESS.

San Francisco, August 2, 1939

[A summary report of the two sessions of Section VII, Public Health and Nutrition, A, Epidemiology, which were devoted to the subject of leprosy, appeared in the last issue of THE JOURNAL, but it was necessary to postpone printing of the abstracts to this issue.—EDITOR.]

MORNING SESSION

1. LOWE, J. (Calcutta, India). Variations in leprosy and its epidemiology seen in different countries.

It is shown that leprosy varies markedly in different countries and different peoples, and it is suggested that the chief reason for this is a variation in the

susceptibility of different races, which may possibly be caused by the production of a form of racial immunity in races long exposed to infection. The information collected is very incomplete and would not justify any dogmatic statements, but further study of leprosy in different countries and peoples along the lines outlined may give interesting and valuable results.

2. RODRIGUEZ, J. N. (*Manila, Philippines*). An epidemiological study of leprosy in the province of Cebu, Philippines.

The intensive field study of leprosy started in 1933 conjointly by the Leonard Wood Memorial and the Bureau of Health in Cebu province is unique in that over 99 percent of the entire population of the surveyed areas were examined for leprosy, thus permitting an accurate determination of its incidence in the whole community. The method of study consists essentially of the following steps: (1) house to house enumeration of the population; (2) physical examination of the inhabitants thus enumerated; (3) a detailed sanitary and sociological census of the area; and (4) epidemiological investigations of all known cases of leprosy occurring in the locality. The highly infected municipalities of Cordova (population, 6,063; leprosy incidence, 17.2 per 1,000) and Talisay (population, 10,672; leprosy incidence, 19.3 per 1,000) have thus been surveyed. For the purpose of control, the municipality of Santander, with the very low incidence of 0.45 per thousand, was studied. The results of these surveys cannot be outlined adequately in this brief summary. In the endemic areas studied there are wide variations in leprosy prevalence, probably due to the fact that the infection maintains itself by means of small, scattered, usually well circumscribed foci, and the intensity of the infection does not seem to depend on any constant differences or similarities in the terrain, the health and sanitary habits of the inhabitants, or their economic status. The attack rate among house contacts, however, is five times higher than those who had not been in household exposure, and a suggestive association is found between the occurrence of leprosy and overcrowding in the house.

3. HASSELTINE, H. E. AND JOHANSEN, F. A. (*Carville, Louisiana*). Leprosy in the Western United States.

A statistical report is given of the number of cases of leprosy, with brief epidemiologic information as to the source of the infection, as shown by the records of patients admitted to the National Leprosarium from western states of the United States. Two hundred and nine individuals have been admitted from the Western States since the institution was opened on February 1, 1921, 177 coming from California. Twenty-eight of these were born in the continental United States, 15 in the insular territories of Hawaii and Puerto Rico, and 176 were natives of foreign countries. The incidence in males as compared with females is higher than in most areas (4.5:1). The incidence by age groups is practically the same as found in other countries. In a small number of cases the individual seems to have contracted, incubated and developed the disease in the states west of the Rocky Mountain Divide.

4. LIE, H. P. (*Bergen, Norway*). Comments on the decrease of leprosy in Norway.

Although about seventy years ago, in 1856, there were approximately 3,000 lepers in Norway, at the present time there are only about 90. His-

tory reveals that the disease has been endemic for at least 1,000 years, even though there has been some fluctuation in its diffusion and intensity. History also reveals that as early as 1850 there had begun to be awakened a realization of the fact that intimate unhindered intercourse with lepers involved a danger that this disease might be spread to others. So far as we now can see, we cannot describe leprosy as a very infectious disease. As to the paths of infection and the mode or modes of transmission, we do not know very much, but everything indicates that special circumstances and conditions are required in order that transmission may take place; and, in general, intimate intercourse of rather long duration with lepers is necessary for the transference of the malady to others. According to personal investigations the years of childhood seem to constitute the most dangerous time.

5. ROTBERG, A. (*São Paulo, Brazil*). Modern trends in the study of the epidemiology of leprosy; importance of hereditary factors.

Based on the results of 1,529 lepromin tests, in both healthy and lepromatous persons, the author regards the reaction as indicative of allergy and immunity, specifically developed against the leprosy bacillus. Conclusions of epidemiological interest are: Leprosy is a very contagious disease, spread by the bacillus-positive cases. The majority of the healthy people in endemic countries, after more or less contact with the bacillus, are infected but are easily and effectively defended through the establishment of an immuno-allergic condition that is indicated by the positive lepromin test. A small minority does not develop this defensive condition, for reasons not dependent on age, sex, or race or nationality, but more probably somatic and inherited. In them the infection remains latent until possibly accessory factors (as debilitating diseases, age, superinfection, environment, nutrition, etc.) leads to the development of the disease. The frequency of declared cases in familial foci would be explained by heredity of predisposition (incapacity of specific immuno-allergization) and the existence of accessory factors. The author urges two types of research, with epidemiological, pathological and possibly therapeutic possibilities: (1) regarding constitutional factors directly connected with the incapacity of immuno-allergization (main group), and (2) regarding the factors that in an anergic case turns a latent infection into a declared one (accessory group).—[Condensed.]

6. HUIZENGA, L. S. (*Shanghai, China*). Distribution of leprosy in China, with special reference to Shanghai.

[This paper has already been dealt with in this department; *THE JOURNAL* 7 (1939) 576.]

7. MUIR, E. (*London, England*). Epidemiology of leprosy.

The importance of epidemiological investigations in leprosy is stressed. Compared to pathological and experimental and clinical research, this side of the leprosy problem has been neglected in the past. The causes of resistance to *B. leprae*, the differences between the two main types of leprosy, the severity of the form of leprosy in one country as compared with that in another—these are examples of problems which are waiting to be investigated. Coordination of methods and records are necessary to make comparisons possible, and for this the findings of the Committee on Epidemiology at the recent International Congress of Leprosy, in Cairo, should be helpful. Advantage should be taken of existing units in carrying out investigations.

8. MCCOY, G. W. (*New Orleans, Louisiana*). Problems of leprosy.

Leprosy continues to present baffling problems, especially from the public health viewpoint. It spreads in some areas and not in others, as is illustrated by the immunity of the northern United States in contrast with the condition in certain parts of the Gulf Coast states. The same condition prevails in Europe; spread occurs very feebly if at all in western Europe, while in the eastern part and in the Mediterranean littoral there are definite foci of transmission. There is no satisfactory evidence that these differences are climatic. Despite the infectious nature of the disease it has rarely been possible to transmit it purposely to man, and it is quite impossible to infect laboratory animals. We are without convincing knowledge that the means of control which have been adopted are of real worth. Our therapeutic weapons are of the feeblest nature; indeed, there is doubt of the efficiency of any drug. The cultivation of *M. leprae* remains an unsolved problem; reported successes of many workers have often not been duplicated by other equally competent workers. It is suggested that leprosy runs a course similar to other epidemic diseases but with a much longer span than most of them, measuring the cycle by generations and centuries rather than by weeks and months as we find in acute infections.—[Condensed.]

9. SAUNDERS, G. M. (*New York City*). Some remarks on the epidemiology of leprosy.

Where leprosy flourishes today, the population is usually of a low social order, living under unsanitary conditions with much poverty, crowding and sickness. Crowding and uncleanness favor direct and indirect contagion. Because a relatively small proportion of those exposed develop the disease, one must postulate variation in susceptibility. It is possible that elimination of susceptibles may, after many centuries of infection, lead to a relative racial immunity, but no positive proofs are available. It is generally believed that infants and children are more susceptible to leprosy than adults, but the apparently greater infection rate in the young may be due to more intimate and more effective exposure to the disease or to an acquired, relative immunity in adults. Likewise, the seeming greater susceptibility in males may also be merely evidence of more effective exposure. There is a close similarity between yaws and leprosy in that yaws, also, is acquired mainly in childhood and the infection rate for males is greater than that for females. The incubation period in leprosy may be as short as a few months or longer than 30 years, and it is doubtless influenced by many factors impossible to evaluate from available data.

10. BADGER, F. L. (*Honolulu, Hawaii*). The possible relation of nutrition to leprosy.

Statements relative to the relation of nutrition to leprosy have appeared in the literature with increasing frequency in recent years. In Hawaii racial and family susceptibility appear to have but minor if any effect on its incidence, which is dependent upon contact with infectious cases and individual susceptibility. If malnutrition plays a role it must be through its effect on the individual resistance to the infection. Since it is impossible to study human leprosy in laboratory animals, it is necessary to confine laboratory investigations to rat leprosy. It has been found that vitamin B₁ deficient rats are much more susceptible to rat leprosy than are the normal control rats. Rats

maintained on the vitamin B₁ free diet and which have received the vitamin in the purified form by mouth are no more susceptible than are normal ones. Evidence has been obtained which suggests that vitamin B₁ may be of value in the treatment of human leprosy. It has been found that the symptoms of acute leprous neuritis are promptly alleviated by transmuscular injections of this vitamin in purified form.

AFTERNOON SESSION

1. CRISTOBAL GONZALEZ, H. Desarrollo de la lepra en Ecuador.

[Abstract not available.]

2. SOULE, M. H. (*Ann Arbor, Michigan*). The bacteriology and immunology of leprosy.

There are a number of phases of the bacteriology of leprosy concerning which our knowledge is woefully inadequate. It is generally acknowledged that the purposeful cultivation of Hansen's bacillus under artificial conditions and with ease has not been achieved. Over a period of years the isolation and serial cultivation of a slow-growing, nonchromogenic, acid-fast organism from human leprous tissue has been recorded. The limited multiplication of the cells indicates that the ideal medium and environment for their saprophytic existence have not been provided. To gain an insight into the statement that in leprosy there is a bacillemia, specimens of blood from over 1,000 patients with active leprosy were cultured and blood films were made. No positive growths appeared and a careful examination of the stained films revealed no acid-fast forms. In keeping with the efforts of others, attempts have been made to produce in animals a progressive infection similar to the malady in man by the injection of cultures as well as of suspensions of fresh, comminuted nodules rich in acid-fast forms. The results have been uniformly negative. No success has crowned the search for a substance which will give a specific skin reaction diagnostic of leprosy. Leprosy, in the unquestioned absence of syphilis, yaws and bejel, interferes with the various serological tests for these spirochetal infections. In our experience about 35 percent of patients with lepra reaction give strongly positive reactions.

3. MACHIAVELLO, A. Specificity of the Lleras reaction in a population free from leprosy.

[Abstract not available.]

4. ROTBERG, A. (*São Paulo, Brazil*). Influence of allergy in pathogenesis of leprosy.

Defining the positive lepromin test reaction, the author divides his 993 cases of leprosy into two main groups according to their "elementary clinical types" and arrives at general conclusions as to the role of allergy in the determination of clinical forms, as follows: There is possibly a latent focus of primary infection, very frequent in the people of endemic zones. From this focus the dissemination occurs, and in the skin the manifestations differ according to the allergic condition developed as a reaction to the primary focus. Allergic cases develop the tuberculoid lesions, also the tuberculoid nerve complications. Anergic ones develop bacillary lesions, from macules to lepromata, and also the bacillary or lepromatous lesions in the nerves. Erythematous and erythematodyschromic nonbacillary macules occur both

with allergy and anergy, with the same clinical aspects, and constitute the initial step of the tuberculoid or lepromatous lesions according to whether the patient is allergic or anergic. The concept of an "incubation period," and that of variability of the individual allergic condition, are criticized.—[Condensed.]

5. HUIZENGA, L. S. (*Shanghai, China*). Hair in leprosy.

[This paper has already been dealt with in this department; *THE JOURNAL*, 8 (1940) 395.]

6. TISSEUIL, J. (*Bamako, French Sudan*). De la lèpre tuberculoïde. [Tuberculoid leprosy.]

Since 1930 this form has become recognized as common throughout the entire world. Typical lesions show three concentric zones; an infiltrated palular zone of peripheral invasion, an intermediary zone, and a central healing zone. Tuberculoid leprosy begins with a papule which increases, spreading by peripheral extension and producing the three successive zones described. Although accompanied by neural disturbances, the disease constitutes a clinical entity whose character depends upon individual resistance. The histological structure of the peripheral zone is marked by a granuloma of lymphocytic and epithelioid cells with giant cells; the central zone is fibrous; the intermediary zone has some characteristics of each. A dermoepidermic graft from the peripheral zone infects healthy skin but regresses when put in a central zone; a graft from a central zone keeps its character in a peripheral zone. Subcutaneous injections of dead human bacilli provoke reactions under patches in 48 hours, under healthy skin in 15 days, the reactions being positive or negative according to the extent of the patches. The patches occasionally become attenuated, with disappearance of the tuberculoid structure; they can resume activity with variable intensity, or show tuberculoid reaction. Although sometimes benign, the disease is more often accompanied by neural lesions which render it severe. The best treatment is intradermal injection of chaulmoogra oil. The nature of the disease makes possible symmetrical intradermal injections to evaluate various therapeutic agents.

7. MARCHOUX, E. (*Paris, France*). La lèpre à la lumière de la pathologie comparée. [Leprosy in the light of comparative pathology.]

Study of rat leprosy throws considerable light on the etiology, prophylaxis, and even treatment of human leprosy. These two diseases have many points in common. They are caused by mycobacteria of identical morphology which have not yet surely been obtained in artificial culture. They have the same manner of transmission, namely, contact. They are favored by filth. Study of the rat disease leads us to believe that insects do not play any part as agents of transmission, with the exception of the fly which can transport the bacilli on its feet and soiled proboscis. The leprosy bacillus would be far more dangerous than the tubercle organism if it were spread as easily, because only a few bacilli (5, in one of our experiments) properly placed are sufficient to cause the disease. The incubation period seems long, or at least we can say that the multiplication of the bacilli, beginning from the time when they are inoculated into the body, is exceedingly slow. Resistance to this multiplication varies according to the individual. The organisms may remain stored indefinitely in one or a few histiocytes, or under some favor-

able influence they may die and disappear. There is no doubt that spontaneous cure occurs more often than we think, when the infection remains localized and the host is resistant.

8. HUIZENGA, J. S. (*Shanghai, China*). Men of note in leprosy history.

[This paper has already been dealt with in this department; *THE JOURNAL* 8 (1940) 383.]

REVIEWS

MUIR, E. Leprosy Review, Special African Number. Reports on Nyasaland, Northern Rhodesia, the Bibanga Leper Settlement (Belgian Congo), Southern Rhodesia, Basutoland, South Africa, Nigeria, the Enugu Leprosy Conference and Cyprus. *Lep. Rev.* 11 (1940) 1-74.

Except among nomadic desert tribes, leprosy is endemic to a greater or less extent in every part of Africa, and in some places the incidence rises to as much as 4% of the inhabitants. In the summer of 1939 the author toured extensively in that continent to study what is being done there for the relief and control of leprosy and to investigate its causes. Contrary to what might perhaps be expected, the severity of the disease does not even roughly correspond to its frequency. This is explained on the hypothesis that only a small minority of the population are highly susceptible, and that most of the severe open cases arise from among them. But in a community which lives in congested and insanitary conditions, in which all kinds of promiscuousness are practised, the frequency and closeness of contact leads to repeated infection which breaks down the natural resistance of many of the nonsensitive majority; in those, however, infection gives rise as a rule only to the milder closed neural type of the disease.

Thus in Barotseland, where these unfavorable conditions prevail, only 11% of lepers were of the severe open type, whereas in Nyasaland, where the people are better educated and more sanitary in their habits, there were 35% of that type. This large proportion of severe cases was; however, accompanied by a much smaller total incidence, the number affected from among the resistant section of the community being comparatively small. At the Pretoria institution, where there are both European and Bantu patients, it was possible to make a comparison of the proportions of the types of leprosy in the two communities. Almost all of the Europeans suffered from the severe open type, but only 25% of the natives. At first sight this suggests greater racial susceptibility among the Europeans, and that is supported by the fact that among another European group of lepers, those in the Cyprus leper farm, 98% of the patients were of the same severe type.

Different methods of dealing with leprosy are employed in these different countries. In South Africa, where up to £125,000 a year is spent on leprosy control, the system is one of compulsory segregation in government institutions, of which there are five. Most of them, however, are popular because of the good treatment of the patients, who come in willingly, so that the Leper Act has seldom to be invoked. In the last twenty years no fewer than 4,502 patients have been discharged with disease arrested, and of these 2,738 have already been entirely freed after a further period of surveillance. A similar system is employed in Basutoland.

In Southern Rhodesia excellent results are obtained at the government institution at Ngomahuru, where even the severe lepromatous form yields to treatment. It is considered that the climate, which though sufficiently warm is dry and invigorating, is largely responsible for these good results. In consequence there is a proposal on foot that a British National Leprosarium should be established there for private leprosy patients from other parts of the Empire.

In Nyasaland and Northern Rhodesia antileprosy work is chiefly in the hands of missions, who treat comparatively small numbers of patients in numerous camps. While this work is undertaken with much devotion, the medical superintendence is not always adequate and more satisfactory results could be obtained with more financial help and more expert supervision.

The tour in Nigeria included most of the principal leprosy institutions. It is calculated that there are between 200,000 and 400,000 lepers in Nigeria. While many of these are in the Northern Provinces, the main seat of incidence is among the Ibo- and Effic-speaking peoples of the southeast. Here an excellent cooperative scheme exists between government, native administrations and missions. The last of these are responsible for running the institutions, while the first two supply most of the funds. The approved scheme includes a large central agricultural-colony leprosarium in each province. But since with such large numbers it is impossible to include in an institution more than a fraction of all the lepers in a province, village centers are being formed where, after a survey, the lepers are isolated at a distance from the village and treatment is supplied, this being carried out under the superintendence of the leprosarium doctor and his assistants. Ex-lepers who have been trained during their time of treatment in the institution are stationed in these villages, to help as dressers and general advisers and to insure that segregation is observed. This system is very popular, one village vying with another in making it successful. It is on a noncompulsory basis, except in so far as the informed public opinion of the village forces any unwilling patient to cooperate. In Nigeria chiefly, but also in other countries, the British Empire Leprosy Relief Association has supplied a number of doctors and lay workers (the latter with the help of Toc H) who take an important part in this work.

The tour also included the inspection of an important leprosarium in the Katanga province of the Belgian Congo, and finished up with a short visit to Cyprus where, though leprosy is not looked upon as one of the most serious public-health problems of the island, it is one which might be brought under complete control in a comparatively short time if a serious and continuous effort were made.—[From a Special Article in *The Lancet* 238 (1940) 422-423.]

DUBOIS, A. *La Lèpre. Diagnostic-Traitement-Propylaxie*. With a preface by E. Marchoux. Antwerp, 1939. Publié aux Frais de la Commission de la Lèpre, Établie par A. R. du 17 Décembre 1937 et Vendu au Profit des Lépreux du Congo Belge et du Ruanda-Urundi, 108 pp., cloth.

This little book, received with the compliments of the Fondation Père Damien, is an addition to the recently published group of concise reviews of the salient features of this disease. It is dedicated to practical service

as a guide for the physicians of the Belgian Congo and, purposely, discussions of pure scientific interest are abbreviated and references are relatively few. Written after the Cairo congress, of which the author was an active member, the terminology and to a considerable extent the viewpoint of the book conforms with the work of that meeting, but the author's personal experience with the disease in the field and the laboratory is evident throughout. As is natural, and appropriate, a considerable amount of the statistical matter pertains to the Congo.

The twelve chapters, with their various subheads, cover the field thoroughly, but with an admirable brevity that is attained quite as much by conciseness of statement as by selection of topics. The author has recognized the fact that in such a summary it is necessary to exercise special care in choosing essential facts and in presenting them, and he has done so. It would be pointless to comment on statements with which one might not agree—of which, it is to be said, very few have been found—or to go far into the matter of subjects not dealt with. It is a little unexpected in so up-to-date a work, in which place is given to the histamine and pilocarpine tests in diagnosis, that only isolated notice is given the lepromin reaction, with precedence given the Rubino and formol-coagulation tests. Nothing is said that would arouse interest in the practical application of that reaction in field work in connection with the classification of cases or prognosis of treated cases. Due note is made of the earliest lesions as they have been reported in recent years from the Philippines and India, but no mention is made of the abortive case in the clinical section, and only briefly in that on prognosis. There is little else of this tenor to be said.

The illustrations are fairly well reproduced, thanks to the quality of the paper used. They comprise photographs from the Belgian Congo, including the diffuse as well as the more obvious lepromatous conditions, and also the several main classes of leprids, and eleven photomicrographs of the author's own material, equally illustrative of the typical histological features of those lesions. Professor Marchoux's commendation of this little book can be heartily endorsed.

—H. W. W.

ARTICLES NOT ABSTRACTED

[The following list of articles supposed to have been published in 1938, but of which we have not obtained abstracts, is printed in order to make the reference material of *THE JOURNAL* as complete as possible. Any of the missing abstracts that are made available later will be used.—EDITOR.]

- ALEIXO, A. Dados técnicos e administrativos referentes a Colonia Santa Izabel, 1936. *Bello Horizonte*, 1938, 55 pp.
- ALMEIDA. A preservação da infância na luta contra a lepra. *Rev. Combate Lep.* 3 (1938) 50.
- ANDRUZZI. Problemi igienici dell'imperio coloniale. (Profilassi della lebbra.) *Arch. italiano Sc. Med. Col. e Paras.* 19 (1938) 19.
- [ANONYMOUS] Leprotic keratitis. *Report Ophthalm. Lab., Giza, Cairo* 12 (1938) 57.
- BABLET, J. La lèpre, problème scientifique, problème social. *Rev. Hyg. et Méd. Prév.* 60 (1938) 81-98.
- BENNETT, H. J. Mokagai (leper colony). *Jour. Roy. Nav. Med. Serv.* 24 (1938) 335-338.

- BONCINELLI, U. Tentativi di cultura del bacillo della lebbra. *Arch. italiano Dermat. Syph. e Vener.* 14 (1938) 105.
- BONCINELLI, U. Ricerche e osservazioni sulla reattività dei lebbrosi alla cosiddetta "lepromine." *Arch. italiano Dermat. Syph. e Vener.* 14 (1938) 107.
- BRANCO RIBEIRO, E. Achado cirurgico em um caso de lepra nervosa considerado extinto. *Rev. Brasileira Leprol.* 6 (1938) Spec. No., pp. 175-178.
- BRANDEN. Congrès international de la lèpre (Le Cairo, Mars, 1938). *Bru-xelles Med.* 18 (1938) 1027.
- BÜNGELER, W. Lepraprophylaxe und Leprabekämpfung in São Paulo. *Deutsch. med. Wchnschr.* 64 (1938) 686-688; 721-723.
- BURSCHKIES, K. Flacourtiaceenöle und ihre derivate. *Angewandte Chemie.* 51 (1938) 7721.
- BYRNE. Hormona vasomotora del pancreas y algunas de sus aplicaciones. *Lepra. Artigo Avulso (Cali)* (1938).
- CAMBRESSÉDES, H. Rappel des notions essentielles sur l'état actuel du traitement de la lèpre. *Rev. Méd. et Hyg. trop.* 30 (1938) 320-325.
- CAMPOS MELLO. Estudos sobre e hemo-sedimentação em lepra. *Rev. Med. Paraná* 7 (1938) 177.
- CAPANEMA, G. AND XAVIER DA SILVEIRA, A. Historico da cooperação privada no combate á lepra no Brasil. Rio de Janeiro, 1938, 78 pp.
- CARDOSO, H. T. Observações sobre o emprego do óleo de sapucainha no tratamento da lepra. *Acta med. Rio de Janeiro* 2 (1938) 145-150.
- CASTRO GOMES. Sedimentación globular en la lepra. *Rev. Hig. (Bogotá)* 19 (1938) 9.
- CHALA, H. J. I. AND DE P. BARRERA, F. Profilaxis de la lepra. *Rev. Fac. Med. (Bogotá)* 7 (1938) 257-327.
- CICHITTO, E. Problemi igienici dell'empero: la lebbra. *Ann. d'Igiene* 48 (1938) 422-434.
- CLINICA. Perversità del lebbroso. *Gior. italiano Dermat. e Sifil.* 2 (1938) 2.
- COELHO, J. T. Tratamento de lepra pelos esterres creosotados e iodados de chaulmoogra. *Rev. Med. de Minas* 5 (1938) 37.
- COLONION. La lutte contre la lèpre. Effort des missions catholiques dans les colonies françaises. *Thèse de Paris* 8 (1938) (No. 738).
- [COMMISSION] Los trabajos del profesor Federico Lleras Acosta sobre lepra. *Rev. Fac. Med. (Bogotá)* 6 (1938) 569-584.
- DONETTI, E. Le forme nom comuni di lebbra' e possibili associazioni morbose. *Gazz. Osp.* 59 (1938) 314-316.
- FABIANI, G. Sur un cas de lèpre indigène en Algeria. *Bull. Soc. Path. exot.* 32 (1939) 276-278.
- FERREIRA. El problema de la lepra en Nariño. Bosquejo epidemiológico. *Rev. Hig. (Bogotá)* 19 (1938) 6.
- FIGUEROA Y MORALES, M. Prophylaxie antilépreuse. *Thèse de Paris*, 1938, 80 (No. 326).
- FISKE, A. Leprosy. *Hygeia* 16 (1938) 228.
- GAITÁN MARIÑO, A. Crítica a la campaña antileprosa en Colombia. *Thesis, Bogotá*, 1938.
- GALVEZ, R. Study of a benign form of leprosy localised in the feet. *Lep. Rev.* 9 (1938) 71-76.

- GIROLAMI. I progressi della patologia tropicale in Italia durante l'era passista. Lebbra. Arch. italiano Sci. med. col. e Paras. 19 (1938) 33.
- GUERRERO. Elefantiasis de los Arabes y pseudo lepra. Guatemala Med. 3 (1938) 2.
- GUPTA, K. K. A case of pellagra simulating leprosy. Lep. in India 10 (1938) 70-71.
- GUSHUE-TAYLOR, G. Leprosy—ancient and modern. London Hosp. Gaz. (1938) 113-115; ii-xii (supplement, March); also East African Med. Jour. 15 (1938) 272-274.
- GUTIÉRREZ, C. Comentarios a una tesis de grado. [See Gaftan Mariño.] Rev. Fac. Med. (Bogotá) 6 (1938) 623-627.
- HARADA, M. Pri la influo de leprsero al freskado de Thlium pratemse. La Lepro 9 (1938) suppl., p. 81.
- HENDERSON, G. The problem of leprosy. Med. Bull. Bombay 6 (1938) 88-90.
- IKEJIRI, S. The psychological study on lepers. Third report. La Lepro 9 (1938) suppl., p. 81.
- JIMENEZ. La lepra se inicia con la atrofia circumscribita a los maculos. Rev. Therapeut. Peruana 2 (1938) 5.
- JOULIA, P. La lèpre à travers l'histoire. Bull. Soc. méd. St. Luc. 44 (1938) 65-82.
- KAWASOME, Y. Die im Shinto-Gebet vorkommende Lepra. La Lepro 9 (1938) suppl., p. 123.
- LAMB, P. H. AND TURNBULL, T. A. Leprosy. Jour. Roy. Nav. Med. Serv. 24 (1938) 327-334.
- LESSA, A. Crianças leprosas, sifilíticas e paludicas. Africa Med. 4 (1938) 72.
- LIE, H. P. History of leprosy in Norway. Med. Rev. (Bergen) 55 (1938) 49-69.
- MARGAROT, J., RIMBAUD, P. AND RAVOIRE, J. Erythème nouveau, manifestation initiale d'une lèpre tubéreuse. Bull. Soc. française Dermat. et Syph. (1938) 1251-1254.
- MAURANO, F. Angioma serpiginoso ou nevus-lupus de Hutchinson em doentes de lepra. Rev. Brasileira Leprol. 6 (1938) Spec. No., pp. 157-159.
- MENDES. Censo de lepra (Alagôas). Rev. Combate Lep. 3 (1938) 86.
- MOISER, B. British Empire leprosarium. Lep. Rev. 9 (1938) 169-172.
- MUIR, E. The International Congress of Leprosy. Lep. Rev. 9 (1938) 105-109.
- MUIR, E. Leprosy; plan for its control. Newcastle Med. Jour. 18 (1938) 1-9.
- MUIR, E. The epidemiology and control of leprosy. Trans. Roy. Soc. Trop. Med. & Hyg. 31 (1938) 377-382.
- NASCIMENTO. Os primeiros lazaretos. Rev. Syniátrica 31 (1938) 3.
- NATALI, C. Los desequilibrios endocrinos en los leprosos. Rev. Méd. et Hyg. trop. 30 (1938) 283-296.
- NEKAM, L. Lepra. Corpus icon. Morb. cutan. 2-3 (1938) 80.
- NUZZI, P. La diagnosi precoce della lebbra. Gior. italiano Clin. trop. 2 (1938) 74; 77-79.
- DO PÁTEO, D. Um caso de lepra com aspecto clínico raro. Rev. Brasileira Leprol. 6 (1938) Spec. No., pp. 153-155.
- PATEY, G. A. Le problème de la lèpre au Japon. Presse méd. 46 (1938) 845-847.
- PETRONICI, G. L'allergometria di von Groer nella lebbra. Atti. Soc. italiano Dermat. e Sif. 1 (1938) 539.
- PORTUGAL, H. Lepra tuberculoide com lesões dos nervos cutaneos. An. Brasileiros Dermat. e Sifilog. 13 (1938) 59-60.

- RADNA, R. Note sur la réaction de Mitsuda chez des sujets indemnes de lèpre. De l'influence du traitement de la lèpre sur la bacillémie lépreuse et sur les résultats de la réaction de Mitsuda. *Ann. Soc. belge Méd. Trop.* 18 (1938) 63-72.
- RADNA, R. Sur le traitement des algies lépreuses par le cobranyl. *Ann. Soc. belge Méd. Trop.* 18 (1938) 73-74.
- RAJAN, T. S. S. Some problems in leprosy relief. *Indian Med. Jour.* 32 (1938) 569-570.
- RODRIGUES DE SOUZA, A. Lepra: Poikiloderma de Petges-Jacobi com concreções calcareas sub-cutaneas; síndrome de Weir-Mitchell. *Rev. Brasileira Leprol.* 6 (1938) Spec. No., pp. 161-174.
- ROSS, E. New approach to the old plague. *Survey Graphic* 27 (1938) 384-387.
- RYRIE, G. A. Popular misconceptions of leprosy. *Lep. Rev.* 10 (1939) 123-129; reprinted from *Malay Mail*, April 29, 1938.
- RYRIE, G. A. On the treatment of leprotic ulcers. *West African Med. Jour.* 10 (1938) 41.
- SALIBA. Problema da lepra; seu contagio. *Rev. Med. Minas (Belo Horizonte)* 5 (1938) 11.
- SAMBUC, E. Notes sur la lèpre dans la province de Bac-Lieu (Cochinchine). Necropsie de deux lépreux. *Rev. Méd. et Hyg. Trop.* 30 (1938) 253-260.
- SANTRA, I. Leprosy survey. *Indian Med. Jour.* 32 (1938) 328.
- SCHMIDT, P. Lepra tuberosa. *Dermat. Wchnschr.* 106 (1938) 311; *Arch. Dermat. u. Syph.* 177 (1938) 272.
- DA SILVA CAMPOS, M. A. Ligeiras notas sobre a história da luta contra a leprose, em Minas Gerais. *Arq. Saúde públ.* 6 (1938) 17-38.
- SILVEIRA, L. M. Tratamento cirurgico das neurites leprosas agudas. *Rev. Brasileira Leprol.* 6 (1938) Spec. No., pp. 193-196.
- SILVEIRA, L. M. Amputações e mal perfurante plantar. *Rev. Brasileira Leprol.* 6 (1938) Spec. No., pp. 219-229.
- SIMMONS, J. S. Leprosy. *Oxford Medicine*, 1938, vol. 5, pp. 387-396.
- SITANALA, J. B. Het Noorweegsche systeem van leprabestrijding. *Geneesk. Tijdschr. Nederlandsch-Indië* 78 (1938) 1831-1844.
- SMITH, D. W., BLOCKER, T. G. AND TUMEN, H. J. Use of chaulmoogra oil in treatment of chronic arthritis. *Jour. Florida Med. Assoc.* 24 (1938) 586-596.
- SORINSON, N. S. Nodular-anesthetic type of leprosy resembling lichen ruber planus. *Vrach. delo* 20 (1938) 293-294.
- SOUZA-ARAUJO, H. C. Etiologia da lepra. *Rev. Med. Cir. Brasil* 46 (1938) 206; 538.
- STEINER, J. Ein neues Lepra-Institut in Abessinien. *Wien. med. Wchnschr.* 88 (1938) 1323.
- STRACHAN, P. D. Leprosy. *Caledon Med. Jour.* 16 (1938) 149-163.
- VON SWERBEJEV, N. T. Psychische Veränderungen bei Lepra. *Arch. f. Psychiat.* 108 (1938) 572-593.
- TACHIKAWA, N. Ein Fall von Tuberculosis cutis verrucosa bei einem Lep-rakranken. *Jour. Oriental Med.* 29 (1938) 96.
- TACHIKAWA, N. One case of leprosy survey in Yamaguchi prefecture. *La Lepro* 9 (1938) suppl. p. 85.
- TAJIRI, I. Ein Fall von Lepra maculosa mit Atemnot, Krankheitsverlauf sowie Obduktionsbefund. *Oto-rhino-laryng.* 11 (1938) 1109-1110.

- TIANT, F. R. El Primer Congreso Internacional de la Lepra. Vida Nueva 42 (1938) 11-30.
- VOLK, R. Lepra. Leprabazillus, Züchtung des L. B. Reaktionen, Rattenlepra, Verbreitung der Lepra, Pathologie, Infektion, Klinik, Behandlung. Dermat. Ztschr. 78 (1938) 389-402.
- WHITE, W. C. Tuberculosis, leprosy and other diseases caused by acid-fast bacteria. Science 87 (1938) 14-15.
- WONG, C. L. Six months of leper work in the Philippines. Lep. Quart. 12 (1938) 85-94.
- WONG, K. C. The story of snake wine. Lep. Quart. 12 (1938) 116-119.
- YANO, M. Dreimal über die Takada'sche Reaktion bei Lepra, insbesondere über die Beziehungen zwischen dieser Reaktion und dem Jodsäurewert. La Lepro 9 (1938) 127-128 (abstract).