CURRENT LITERATURE

It is intended that the current literature of leprosy shall be dealt with fully in this department. It is a function of the Contributing Editors to provide abstracts of all articles published in their territories, but when necessary such material from other sources is used when procurable.

AUSTIN, C. J. Central Leper Hospital, Makogai (Annual Report for 1943.) *Fiji, Legislative Council. Council Paper No. 17.* 1944, 7-9.

In 1943 the number of patients at the beginning of the year was 645, the admissions numbered 77, the discharges 65, 26 died, and 631 remained at the end of the year, a reduction of 14. Of a total of 942 patients admitted in ten years, 295 came from Pacific Islands beyond the Colony of Fiji; in the same period 75 were readmitted, 17 of whom were again discharged. Of the 77 admitted during 1943, 17 were Fijians, 20 Indians, 32 Cook Islanders, 5 Samoans, 2 Niue Islanders and 1 Euronesian. Of the 32 Cook Islanders no less than 24 were early N_1 cases, so it is not surprising that a high proportion of those discharged were persons from those islands. Of 64 conditionally discharged, 52 were N_1 and N_2, four were L_1 and eight L_2 cases, and one formerly discharged lepromatous case was readmitted with retrogression. Among the Cook Island cases there were far more who were relatives of other patients than among other communities, and many of them were children, so without care, the disease would soon assume a far more threatening aspect. An important feature of this institution is the amount of paid work the inmates do both in agriculture and handicrafts, for their earnings amounted to £2,890 in the year. A Fiji branch of the Lepers' Trust Board has also been formed to assist those in need. Progress is thus being made in many ways in this up to date institution under the care of Dr. Austin. [Abstract from Trop. Dis. Bull. **42** (1945) 295.]

(B. E. L. R. A.) Annual report for Madras Provincial Council for 1943-44. Madras Diocesan Press. 20 pp.

An advance is reported in an order for the admission of cases of leprosy to general hospitals and in arrangements for the instruction of the students of Madras Medical Colleges by an expert on leprosy. Epidemiological inquiries have been continued through village surveys, regarding which statistics are recorded to show a gross incidence of 24.7 per thousand and a child rate of 26.8 per thousand; very high rates. The open case rate was only 11.5 per thousand in an area with poor economic conditions. Repeated surveys confirm the earlier conclusion that abortive lesions have a great significance. In the development of lepromatous cases, incipient lesions of childhood in the form of simple macules, including neural macules, play an important part and may be classed as prelepromatous in nature. The night segregation of infective cases in villages, to lessen their contact with susceptible children, has been followed by a reduction in child infections. It is proposed to examine all school children in Madras City for signs of early disease and to allow contacts to be traced, but a leprosy hospital to hold 500 infective cases is urgently needed. Uninfective crip-

pled beggars could be provided for by a religious body. It is estimated that in Madras city there are 5,000 to 7,000 cases; of these at least 500 to 750 are probably infective. A children's Leprosy Sanatorium at Ettapur admitted 31 boys during 1942, discharged 17 and had 39 remaining at the end of the year. Such institutions should be multiplied. Surveys show very great variations in incidence (from nil to 124 per thousand) in villages close to each other; there is much greater contact with infective patients in some villages than in others. In an anti-leprosy campaign, highly infected villages should be sought out and dealt with. As elsewhere, lepromatous cases gave negative lepromin reactions. Work on the Wassermann reaction showed increasing positive results with the advance of lepromatous cases without any indications or history of infection with syphilis; these were, consequently, the direct result of leprosy infection. [Taken from abstract in Trop. Dis. Bull. 42 (1945) 291.]

CHATTERJI, M. B. A plea for the establishment of a colony for infectious cases of leprosy in Bengal. Leprosy in India 15 (1943) 15-19.

Bengal with thousands of infective cases of leprosy has seven institutions of the hospital or semi-colony type, accommodating only about 800 cases. There is a real need for more colonies and especially an agricultural one. This colony if properly planned could be partially self-supporting for food, clothing, and most of the daily necessties of life could be produced in the colony by the patients themselves. It could not be wholly self-supporting. The main idea should be isolation of the infective case and self-support should be second to this. Every patient should contribute as much work as he is fitted for and physically able to perform so as to keep the cost low. Work will also benefit the patient mentally and physically.

The author discusses in detail plans of organization, scheme of work, finance, acquisition of land, construction and management of the colony. This program encourages the type of colony proposed by BURGESS in "A World within a World." (See the JOURNAL 11 (1943) 1-7.)—H.B.

CHORINE, V. Le sulfamide dans la lèpre. Traitement des plaies, des brûlures, des ulcères et des maux perforants chez les lèpreux. (The treatment of wounds, burns, ulcers and perforating ulcers, in leprosy with sulfanilamide.) Bull. Soc. path. exot. 36 (1943) 46-55. (13 refs.)

The paper deals with local applications of paraaminophenylsulfamide (sulfanilamide) in wounds and ulcers of persons with leprosy. Fresh wounds in sufferers from leprosy do as well under this treatment as those in other subjects, and this is also true of surgical wounds, examples of which are given. Burns, which so often occur in anesthetic subjects, have also given excellent results. Of greater interest is the success of the local treatment with sulfonamides in 18 out of 19 cases of ulcers other than the more obstinate perforating ulcers in neural cases; some of them were of two to three years duration. In these cases the wounds were washed in boiled water and sprinkled or coated with a paste of the preparation; at first daily and, after suppuration had ceased, every two or three days, to act on secondary infection. Healing is sometimes slow in cases with much damaged nerves and perforating ulcers, and applications of silver nitrate may be required in the later stages, but success was obtained in over 50 per cent of these also. [Abstract from Trop. Dis. Bull. 42 (1945) 298.]

CHORINE, V. and CHABAUD, A. Lèpre du rat et sulfamide. (Rat leprosy and sulfanilamide.) Bull. Soc. path. exot. **36** (1943) 82-5.

A former trial reported in 1936 (*Trop. Dis. Bull.* **34** (1937) 319) of the treatment of rat leprosy by paraaminophenylsulfamide (sulfanilamide) in doses of 10 mgs. two or three times a week showed no effect in retarding the progress of the disease. Subsequent trial of this drug in a case of human leprosy showed that the bacillus of Hansen is sensible to the action if sufficiently high doses are injected directly into the diseased tissues, but it is not effective in any feasible oral doses. The present authors have, therefore, repeated their attempts to control the progress of rat leprosy by injections of this drug, which is also known as 1162F, using larger doses than in the former trials. Only slight retardation in the development of the rat disease was obtained. Moreover, no direct lethal action on rat leprosy bacilli was obtained after exposing them to the action of a 2 per cent saline solution for up to 72 hours. [From abstract in Trop. Dis. Bull. **42** (1945) 298.]

LINHARES, HERMINIO. Possibilidades de transmissão e vias de inoculacao da lepra murina em ratos e outros animais. (Possible routes of transmission of rat leprosy in rats and other animals.) Mem. Inst. Oswaldo Cruz. **38** (1943) 321-51 (101 refs. and English summary).

The author mentions the many possible ways by which rats may become infected with the Stéfansky organism, giving quotations from the literature dealing with the experiments connected therewith. He deals with: (1) Insect transmission by *Lucilla caesar*, *Calliphora vomitoria*, *Musca domestica*, *Haematopinus spinulosus*, *Ctenocephalus serraticeps*, *Laelaps echidninus*, *Polyplax spinulosa* and others, showing how the organism has been found in them and attempts have been made to cultivate them, usually with barren results. The insects certainly contain acid-fast bacilli and if the rats devour a large number of them they may become infected, but this is not insect transmission in the usual and accepted sense; it would come rather under the next heading. (2) Infection by the alimentary route. Rats fight, and eat their dead opponents, and may thus become infected. Feeding rats with rat leproma tissue rich in bacilli is followed by widespread infection, in glands, liver, lungs, spleen, and kidneys in 24 weeks onwards. (3) Cutaneous infection; scratches, wounds and bites are frequent among rats owing to their fighting, and the organisms can easily enter thereby. (4) Congenital transmission finds no evidential support. (5) Intranasal infiltration. Some have reported finding the organism in the nasal secretion, others have tried to produce the disease by experimental instillation, but without result. A certain species, the camondongo, has shown pulmonary infection from this, but the ordinary rat is less susceptible and is rarely, if ever, thus infected. Other methods, such as intradermal, intracardiac, intravenous, and intracerebral, are of academic interest only. Genital infection occurs experimentally and the bacteria can traverse the vaginal mucous membrane and in the end produce generalized disease.

In the second part quotations from the literature tell of the successful results of inoculation into guinea pigs, rabbits, camondongos, *Macacus rhesus*, opossums, fowls, and pigeons by various routes. The author ends by giving an account of his own attempts to infect fowls and pigeons. He was able to infect the former by feeding and also by intramuscular and

intraperitoneal injection; the latter by intramuscular or intravenous inoculation. [Abstract from Trop. Dis. Bull. 42 (1945) 1015.]

MUDROW, LILLY and SCHULTZ, F. Die Rattenlepra unter Vitaminmangel und bei chronischer Sapotoxinverabreichung. (The influence of vitamin deficiency and of prolonged administration of sapotoxin on rat leprosy.) *Zentralbl. f. Bakt.* I **151** (1943, 50-59, 3 figs. (10 refs.)

The main part of this paper deals with the effects of vitamin B_1 deficiency on the development of inoculated rat leprosy. The results were largely negative, for vitamin deficiency did not appear to increase the generalization of infections with rat leprosy in the case of either B_1, biotin or pantothenic acid, nor was the spread of the rat leprosy bacilli through the system of the animals influenced. No specific effect of the vitamin deficiency on the pathological process could therefore be established, though some general influence may have been exerted in the direction of aggravating the disease. These animal tests may indicate the likelihood of similar influence in human leprosy. The last part of the paper gives data indicating that the supply of sapotoxins to rats infected with rat leprosy does not intensify the severity of the disease. [Abstract from Trop. Dis. Bull. 42 (1945) 814.]

PARMAKSON, P. Die pathohistologische Reaktion der Haut bei Lepra. (The pathological reaction of the skin in leprosy.) Deut. Tropenmed. Ztschr. 47 (1943) (545-77, 10 figs. (45 refs.)

The author reports the results of a careful study of 20 lepromatous and 18 nerve leprosy cases, in different stages of the disease, by means of microscopic sections of the affected skin (including examination for *M. leprae*), the sedimentation test and the Mitsuda reaction. The most important data are shown in a table and the answers to five questions he set himself to deal with are as follows:

1. Active skin lesions of nerve leprosy are characterized by tuberculoid changes.
2. In the case of clinically lepromatous lesions the morbid histology shows no tuberculoid changes in the skin.
3. In clinical nerve cases no lepromatous changes are found on section.
4. Tuberculoid and lepromatous changes do not appear simultaneously.
5. It is improbable that a change from one type to the other could be followed histologically. The typical changes of one type disappear before those of another type appear.

The data recorded regarding the red cell sedimentation rate are in accordance with those of other observers in that it is increased in well-marked lepromatous cases, although this may not be so in early cases. Nerve cases show increased rates only when complications are present, such as perforating ulcer of the foot. The Mitsuda reaction was negative in nearly all lepromatous cases except those in a very early stage, and positive in nerve cases, as found by others. (The histological changes are well illustrated and the paper is worthy of close study by those interested.) [Taken from abstract in Trop. Dis. Bull. 42 (1945) 296.]

DE SOUZA-ARAUJO, H. C. Infeccão espontânea e experimental de Hematófagos (Ixodídeos, Triatomídeos, Culicídeos, Hirudíneos, Pediculídeos e Cimicídeos) em leprosos. Possibilidade de serem eles vectores on transmissores da lepra. (Natural and experimental infection of blood-sucking insects and leeches from leprosy patients.) Mem. Inst. Oswaldo Cruz. 38 (1943) 447-84, 21 figs. (30 refs.) English summary.

The author quotes from the reports of other investigators and then proceeds to relate the results of his experimental work in testing whether the insects in question become infected after being allowed to feed on leprosy patients. Details are given of each set of experiments and for general information these may be summarized as follows:—

Ticks.—Amblyomma cajennense and *Boophilus microplus* caught feeding on leprosy patients were found to contain bacilli acid- and alcohol-fast, Hansen's organism, but growth of them was not obtained. Only female ticks were found thus infected.

Triatoma.—T. infestans and *Panstrongylus megistus (T. megista)* were found naturally infected. Experiments were carried out with these and with *Rhodnius prolixus* and other Reduviids, and it was found that the larvae of *T. infestans* do not insert the proboscis deeply into the skin, whereas the nymph and adult penetrate more deeply and infect themselves. Some writers have affirmed that bacillemia occurs in leprosy patients only at the time when there is fever, but this appears to be erroneous.

Culcidae—Psorophora ciliata, P. varipes, P. ferox, and *Aëdes crinifer* were found to have ingested many bacilli after feeding on a patient.

Leeches—Diametrically opposing opinions have been stated as to the infectivity of water leeches; some have stated that after sucking the blood of patients no bacilli can be found, others that they are to be seen every time. VAN BREUSEGHEM in 1937 [*Trop. Dis. Bull.* **34** (1937) 905] examined 165 specimens taken from Lake Egoba in the Congo, much frequented by leprosy patients, and found the organism in three of them, very many in one. The author convinced himself that leeches do ingest the organisms and excrete them in their feces.

Cimicidae.—GOODHUE and others have reported finding these bacilli in *Cimex lectularius* which had fed on patients, but the author did not find any positive among specimens collected in the beds of patients and sent to him for examination. [Abstract from Trop. Dis. Bull. 42 (1945) 1008.]

DE SOUZA-ARAUJO, H. C. Verificacão, em condicões naturais, da infeccão de mais três Hematofagos *(Anophelineos, Flebotómos e Simulideos)* em leprosos. (Natural infection of three more blood-sucking insects from leprosy patients.) Mem Inst. Oswaldo Cruz. 39 (1943) 167-76, 10 figs. English summary.

Ten patients, all L_3, were selected and insects which bit them were captured and examined. The author had previously demonstrated infection by acid- and alcohol-fast bacilli in the body louse and in the nymph of the tick *Amblyomma cajennense,* and these findings he was able to confirm, but he also found that two species of *Anopheles—A. albitarsis* and *A. tarsimaculatus*—were heavily infected, that *Phlebotomus intermedius* showed the bacilli in both the proboscis and the stomach; they were present also in smears made from two specimens of *Simulium (S. pertinax?).* [Abstract from Trop. Dis. Bull. 42 (1945) 1008.]

DE SOUZA-ARAUJO, H. C. A lepra tuberculoide, ou melhor, a lesão tuberculoide na lepra, representa uma fase de transicão desta dermatose e não uma formalclinica autônoma. Novos achado bacterioscópicos na linfa subcutânea de leprosos. (Tuberculoid lesions not a distinct form of lebrosy.) Mem. Inst. Oswaldo Cruz. **39** (1943) 77-96, 18 figs. (12 refs.) English summary.

The author brings evidence to show that the division of leprosy into lepromatous, tuberculoid, and macular types is an artificial one and rests on no sound basis. In his view all cases are mixed, those regarded as cutaneous have also the nerves to the part affected. Using the Lleras technique of examining the cutaneous lymph [see *Trop. Dis. Bull.* **41** (1944) 220] in co-called tuberculoid cases, he found small granules and coccobacillary forms of this organism, acid-and alcohol-fast. Relapses in burned-out cases are due, it is said, to development of these forms of the bacillus. The article contains a series of excellent photographs showing the "tuberculoid form" of leprosy. [Abstract from Trop. Dis. Bull. **42** (1945) 1010.]

DE SOUZA-ARAUJO, H. C. Preparo de antigenos (Leprolinas Souza-Araujo) de culturas de bacilos ácido-álcool resistentes isolados de leprosos. Seu emprêgo intradérmico, comparativamente com o da Lepromina, e subcutâneo ou intravenoso como tentativa terapêutica. (Preparation of de Souza-Araujo's leprolins.) Mem. Inst. Oswaldo Cruz. **39** (1943) 349-55, 5 figs. English summary.

In this contribution Professor de Souza-Araujo details his method of preparing the "antigens" from his cultures of acid-alcohol-resistant organisms obtained by allowing certain insects to feed on leprosy patients. These antigens have been used for skin reactions and for comparing these with lepromin reaction. Of the many cultures he has grown, only four give a film on glycerin broth sufficient to yield a serviceable antigen. On the advice of Dr. A. MACHADO of the Oswaldo Cruz Institute the following is the procedure adopted:

1. To 120 cc. of the medium, with a thick deposit and complete rugose film of yellow color, 0.66 cc. of liquefied phenol is added; after vigorous shaking it is placed in the ice-chest for 24 hours.

2. The contents are then transferred to a 600 cc. flask, with 50 Gm. of sterile porcelain beads and the flask is placed in an electric shaker for ten days and nights, by which time the product is a homogeneous, chocolate-colored milky fluid.

3. A few drops of this are sown on Löwenstein's medium and on 5 per cent glycerin agar and incubated for five days at 37° C., to test sterility.

4. To the emulsion of this, 0.5 per cent phenol is added in a proportion of 10 cc. to 100 cc. and the product is distributed in 2 cc. ampoules.

For comparative tests with lepromin these antigens are injected intracutaneously in doses of 0.2 cc. in the front of the arms. The author has sent material for trial to various leprosaria and colonies, 17 altogether, five in S. Paulo, two each in Colombia, Para, Paranä, Minas Gerais and elsewhere. Tests are also to be undertaken to determine their use therapeutically by injecting the leprolins into resistant lesions. [Abstract from Trop. Dis. Bull. **42** (1945) 133.]

ARGÜELLES CASALS, D. Lepra y xanthelasma. (Leprosy and xanthelasma.) Rev. Leprologia, Dermatolcgia y Sifilografia. Marianao, Cuba. **1** (1944) 242-4.

The association of these two conditions in the same patient, states the author, has been observed fairly often but no allusion to it is made in the textbooks. It seems to occur in lepromatous cases, in later middle age, and if autopsy is undertaken leprous lesions are often found in the liver. The author cites three cases under his observation: In a woman of 66, another of 59, and a man of 65 years; these were all among 33 lepromatous patients examined; it was not seen in 22 other of the tuberculoid or non-specific types. The fact that hypertrophy of the liver is common in leprosy without disorder of liver function is ascribed to the infiltration affecting the periportal spaces and not the cellular structure of the organ. [From abstract in Trop. Dis. Bull. 42 (1945) 214.]

AUSTIN, C. J. Central Leper Hospital Makogai, Fiji. 19 pp., 21 figs. 1944, Nov. 28. Issued by the Information Office, Fiji.

This is a well-illustrated general account of the Makogai Leper Hospital, by its superintendent, Dr. Austin, which has been published by the Fiji Government. The hospital is situated on a beautiful island 3 miles by 2½, which contains separate villages for patients of different races from Fiji, the Solomon, Cook, and Gilbert Islands. A general hospital is well equipped and includes an x-ray apparatus. Missionary sisters superintend the nursing and train numerous native nurses. The able-bodied patients are employed on agriculture, fishing, building, etc., which reduces the cost of upkeep and enables the sufferers to earn money. Religious services, sports, concerts and other amenities are provided, and a New Zealand Leper Trust furnishes a Comforts and Christmas Day fund. An increase in the Fijian patients from 352 in 1919 to 444 in 1943 is due to earlier admissions, for the early neural cases have greatly increased, but the lepromatous admissions have fallen from 32 to 0. In 1928 1,000 trees were raised from seed sent by B.E.L.R.A., which provide half the hydnocarpus oil used in treatment. On an average 40 patients have been discharged yearly, with only 10 per cent of relapses during the last 10 years. Compulsory isolation is in force, and under the very favorable conditions provided for the inmates, it is considered to be a success. The Fiji Government have done well in publishing this report, which should stimulate leprosy institutions in other British colonies to emulate the Fiji example of humane and efficient control of the disease. [Abstract from Trop. Dis. Bull. 42 (1945) 737.]

BALAGANGADHARAN, K. V. Significance of serum reactions in leprosy with particular reference to Kahn test. Indian Med. Rec. **64** (1944) 325-30.

The author refers to opinions of MUIR, LLOYD, and MAITHRA that Kahn and Wasserman positive reactions in leprosy are due to complicating syphilis, and to more recent contrary opinions. He goes on to record the following personal experience in the Madras Presidency. Tests were carried out on 170 leprosy patients, in whom syphilis and allied conditions giving positive reactions were excluded with the following results:

Type	L_3	L_2	L_1	N_1
Cases	40	45	56	30
Per cent positive	57.5	36	22	10

He therefore concludes that the Kahn reactions are reliable in leprosy as well as in syphilis. [Abstract from Trop. Dis. Bull. **42** (1945) 740.]

CERRUTI, H. Consideracões histopatólogicas sôbre a lepra da mucosa nasal. (Histopathology of the nasal mucosa in leprosy.) Rev. brasil de leprol. **12** (1944) 309-64, 18 figs. (Bibliography) English summary.

The author has examined sections of tissue from the nasal septa, some taken by biopsy, 46 from the same number of patients from whom a specimen was taken from one side only, and 120 from 60 patients, specimens being taken post mortem. The tissues were fixed in 10 per cent formalin and then embedded in paraffin or sections were prepared by the freezing method. Sections were cut at different levels and stained in several ways: hematoxylin and eosin, the orcein hydrochloride method for elastic fibres, and the Faraco technique for staining Hansen's bacilli. Frozen sections were stained by hematoxylin and Scharlach, R. The author then describes in great detail the changes, but these are set forth more demonstrably in the excellent series of photomicrographs than can be followed in the minutely descriptive text. He divides the lesions into two main groups: those *correlated* with the leprotic process (such as might occur with other chronic inflammatory conditions) keratosis, erosions, edema, congestion and small hemorrhagic foci, sclerosis, hyalinization and so forth; secondly, those peculiar to leprosy such as periglandular lepromatous infiltration, perivascular (including perilymphatic infiltration), the macrophage lepra cells of Virchow, bacillary invasion of the nerve filaments, with thickening of the sheath and degeneration of the fibrils.

He describes these as they appear in the follicular or sarcoid types of tuberculoid leprosy. In his comments he notes that some of these changes may be seen in patients who, clinically, appear to be normal, and, therefore, such examinations may be useful and important in early diagnosis of the disease and especially in contacts. (The photographs of the sections showing the tissue changes are excellently reproduced and the article is documented by a bibliography of over 400 references.) [Abstract from Trop. Dis. Bull. **42** (1945) 567.]

CHALA H., IGNACIO J., and LLERAS RESTREPO, F. Estudio experimental sobre alguno bacilos acido-resistentes obtenidos de material leproso humano. (Nota preliminar.) (Experimental study of acid-fast bacteria isolated from cases of human leprosy.) Publicaciones del Instituto Federico Lleras Acosta. Bogota. 1944, Nov., 31 pp., 10 figs. (4 pages of refs.)

Six strains of acid-fast bacteria isolated from leprosy lesions in man have been cultivated and these form the subject of this work. The authors have investigated their pathogenicity and the results of inoculation experiments in laboratory animals: 381 white mice, 96 guinea pigs, 66 rabbits, 11 *Macacus rhesus (Macaca mulatta)*, 41 fowls and pigeons. The article is so crowded with information that abstract is hardly possible; those interested must consult the original. The English summary is so full and

so accurate, compared with the text, that there will be little or no difficulty in doing this.

The sources of the six strains, the method of cultivation, and characters of the growths are detailed. Doses of the bacilli, suspended in saline, varying between 0.01 and 3.0 cc. were inoculated by various routes, intradermal, subcutaneous, peritoneal, by mouth, and by nasal insufflation. The macroscopical and histological findings are described. Serological reactions (fixation of complement) were tested before the animals received their injections and again subsequently. In the case of the latter, the Lleras-Acosta strain gave a positive in 30.7 per cent, a culture of an organism obtained from the sternal marrow, 1.2, Duval's organism 7.6, Kedrowsky's 2.3, one sent from the National Institute of Health, Washington 12.3, and one from a human leproma 36.1 per cent.

Besides inoculating the healthy animals with the various bacteria, the authors, in some cases, made the inoculations after performing splenectomy to see if sensitization or greater susceptibility to infection resulted therefrom, but with negative results. Animals still alive are being reinoculated and kept under observation and any definite findings are to be reported later. Photographs of animals presenting the grosser lesions are reproduced together with photomicrographs of the histological changes. [Abstract from Trop. Dis. Bull. 42 (1945) 567.]

COCHRANE, R. G. Leprosy control with particular reference to the Madras Presidency. Indian Med. Gaz. 79 (1944) 438-45.

Dr. Cochrane urges sufficient funds, adequately trained personnel, and effective action for any program of leprosy control. Institutional isolation is basic and must be adapted to the conditions of the country. Leprosy should be considered first a medical problem, secondarily a social one, and to this end special departments of leprosy should be established in medical schools in areas where leprosy is endemic. Post-graduate teaching should include elementary, advanced, refresher, and specialist courses.

Surveys in accord with the principles introduced by Muir are essential, to locate and deal with seriously infected areas. Rural isolation should be practiced with the aim of discovering the minimum amount of segregation necessary; night isolation will reduce the chances of infection greatly. In urban centers, home isolation for those with sufficient means might be adopted, but institutional control is necessary for the other. Any patient with leprosy should be entitled to receive treatment at a general hospital or any dispensary, and private practitioners should be prepared to deal with cases. Children's sanatoria are necessary for the success of a prophylaxis program, and these should be coupled with observation of contacts.

Special infirmaries with adequate staffs for caring for deformed and derelict cases should be a separate, but integral part of leprosaria. Leprosy research should be carried on by research units under the coordination of a central agency, and the people should be educated to the necessity for isolation and the need for early treatment.

Voluntary organizations should be included in a control program, especially to care for the advanced and crippled cases, this under the government coordination. Voluntary segregation should be urged, compulsion to be applied only when this fails. Essential to the success of any program

of leprosy control is the selection of a well-qualified medical officer to be in charge of the campaign in each district.—H.B.

CORDOBA Dermatological Dispensary. Survey of five years work, 1939-44. 32 page pamphlet. Printed by Biffiñandi, Córdoba.

This report gives an account of the anti-leprosy campaign carried out by this Dispensary in Cordoba. There were 150 patients registered of whom 43 were lepromatous, 80 tuberculoid, and 27 of the indefinite form. Contacts examined numbered 315 among whom 23 cases of leprosy were discovered.—G. BASOMBRIO

COT LESMES, V. El toxoide diftèrico en el tratamiento de lepra. (Diphtheria toxoid in the treatment of leprosy.) Trans. Primera Conferencie Cubana de Leprologia, Santa Clara, Cuba, April 1 y 2 de 1944. 44-51.

The first part of this paper is concerned with relating the work of COLLIER, OBERDOERFER, McKEAN, and FAGET and JOHANSEN and their results from the use of diphtheria toxoid in leprosy. The author goes on to report the results obtained by him in 63 patients. His results are of special interest because they show fundamental differences from those obtained by McKEAN. The author intended to report on 100 patients, but 37 received less than six doses or did not return for observation and the results in their cases could not be checked. The rest received 6-10 injections at least, four had 33-36 in 14-28 months, and one had 42 in 20 months. Observation has been kept up, in some cases for "a long period" and in none for less than a year. He modified COLLIER'S technique, injecting 0.25 cc. as an initial dose, repeating the injection every two weeks in gradually increasing doses to a maximum of 3 cc. and then reducing to 1.0 cc. In some, in order to test the patient's susceptibility, the first dose was 0.1 cc., then increased by 0.1 cc. every three days till the larger doses were reached; these were given, as with the others, every other week. Later, after this method had been in use for 15 months, the patients received an injection every week up to a maximum of 1.0 cc., and this was maintained unchanged, except for two patients who developed an abscess each time this dose was given and they were therefore given only 0.1 cc.

Of the 63 there were 29 of the lepromatous type. Of these 16 improved, 12 remained stationary and one was worse. Twelve were of the tuberculoid type and of these 2 improved, 9 were stationary and one continued to get worse. Of 22 non-specific cases, 10 improved, 11 were stationary and one worse. If percentages may be permitted to point out the differences with so small totals, 55 per cent of the lepromatous improved, 16 of the tuberculoid and 45 of the non-specific. The verdict "improved" was given if "all or most of the lesions disappeared . . . the rhinitis cleared and sensation returned, the patient gained in weight, and his general health was bettered." All the author's patients were going about and followed their usual way of life. With a chronic disease, subject to periods of remission and exacerbation, it is obviously difficult accurately to assess the value of a special form of treatment, but the author notes particularly the greater proportion of "improved" among the lepromatous cases "among whom we saw truly spectacular results. In 6 of them (four were advanced L_3 cases) the lesions were so changed that patients

who a short time before showed large lepromata and infiltrations of face, ears, and other parts of the body would no longer be regarded as lepers." (Compare this with McKEAN's verdict that treatment with diphtheria toxoid proved to be of no value in either major tuberculoids with numerous bacilli, or in the papular type of lepromatous cases, and even active minor tuberculoids free from bacilli failed to respond. [Abstract from Trop. Dis. Bull. 42 (1945) 44-45.]

DAVEY, T. F. and ROSS, C. An investigation of the effects of cocoyam on leprosy. Leprosy Rev. 15 (1944) 3-11.

Since it has been suggested by Oberdorffer that a diet rich in cocoyam may be a predisposing agent in infection with leprosy, 28 children in Nigeria suffering from leprosy and of low resistance were fed with massive doses of cocoyam; and together with an equal number of controls, they were observed for one year. The action of cocoyam is attributed to a sapotoxin which has a deleterious effect on the adrenal gland.

The cocoyam was boiled for the experiment, a process which might destroy the sapotoxin. If the sapotoxin were heat-labile, it would be negligible in importance since Nigerians eat the food only after it has been cooked. The period from March to June was chosen for the experiment, for although the toxicity of the cocoyam is said to be the greatest in December, most of this food is eaten in the months April to June. The diets of the children were not rigidly controlled because the authors felt this would provide conditions too dissimilar to those existing in the life of these people.

The authors do not consider the results of their test to be conclusive but stated that they could not observe any deleterious effects on leprosy which could be traced to the cocoyam. They maintain that if the sapotoxin does exert some slight toxic effect, this is not a specific action and is only one of many factors predisposing to infection with leprosy in Nigeria.

—H.B.

DEGOTTE, J. Contagiosité de la lèpre neurale. Enquête épidémiologique che les Pygmées. (Infectivity of neural leprosy: Epidemiological study among the pygmies.) Rec. Travaux Sci. Med. Congo Belge. Leopoldville. 1944. Jan., No. 2, 162-4.

This short note on leprosy prevalence among the pygmy tribes of the Belgian Congo raises the question as to how far neural types of leprosy may be contagious to the healthy. The author's experience has led him to admit the occurrence of new infections in areas with only neural cases or with only vague evidence of the presence of lepromatous patients. He admits that he is dependent on the accuracy of his informants, but the examination of a number of pygmies confirmed his hypothesis and he gives data of a number of villages in which only neural cases were found, mostly of a very mild type. He points out that neural cases may at times show lepra bacilli in their nasal cavities, which are likely to be infective. In the Nepoko area 5 to 6 per cent of the population are infected and outpatient treatment is the method of choice for most cases, but those with lepra bacilli in the nasal secretions are better isolated. [From abstract in Trop. Dis. Bull. 42 (1945) 295.]

DEGOTTE, J. Rechereches sur l'activité therapeutique de l'huile essentielle de citronnelle dans la lèpre. (Essential oil of citronella in leprosy.) Leprosy Rev. 15 (1944) 28-35, 1 fig.

The author, working in the Belgian Congo during the war, was unable to obtain sufficient supplies of chaulmoogra oil, so he sought for a substitute. This he found in an oil of somewhat similar constitution obtained from a common Congo plant belonging to the family *Cymbopogon*, from the thick leaves of which it is distilled, and it contains 65 per cent of a mixture of geraniol, citronellol, citral, and citronellal. The remainder is mainly terpenes. It is sterilized by heating on a water bath for one hour. To diminish its irritant properties one part is diluted with nine parts of cotton seed oil, when it can be injected either subcutaneously or intramuscularly in doses of 1 cc. in the first week, 2 cc. in the second, and 3 cc. per week in the subsequent ten weeks. After an interval of fifteen days the course is repeated. In larger doses it may be harmful in lepromatous cases. The following results were obtained from this treatment during 1943:

Cases	Symptoms disappeared	Improved	Stationary	Worse
2,328	114	223	1,763	95

The author does not claim that the treatment is a panacea for leprosy, but he considers that the essence of citronella, in his experience, is comparable in its effects with those produced by chaulmoogra oils. [Abstract from Trop. Dis. Bull. 42 (1945) 394.]

DENSHAM, W. The New Luapula Leprosy Settlement, Northern Rhodesia. (Abstract.) Leprosy Rev. 15 (1944) 53-5.

This is a note on the early stages of the organization of a new leprosy settlement in the densely populated Luapula Valley of Northern Rhodesia, a little south of the Belgian Congo border, by an experienced Toc H worker under the superintendence of the doctor in charge of the neighboring hospital of the London Missionary Society. Buildings are being erected to accommodate 500 patients, with 5,000 acres of land, together with outlying clinics for early cases. Within eight months, over 113 cases have been examined and 60 are attending for injections, and it is hoped to admit 100 patients to the settlement shortly, to make a start in meeting the needs of a hitherto untouched area. [Abstract from Trop. Dis. Bull. 42 (1945) 392.]

DE OLIVEIRA CASTRO, G. M. and MARIANO, J. Transporte e inoculacão de bacilos da lepra pelos mosquitos. (Mosquitoes and leprosy transmission.) Mem. Inst. Oswaldo Cruz. 41 (1944) 511-24, 3 figs. and 2 colored pls.

It is known that after mosquitoes have bitten a leprosy patient the bacteria can be demonstrated in the alimentary canal of the insect, but whether the mosquito can inoculate a healthy subject is not known.

Volunteers having allowed themselves to be bitten by such mosquitoes were examined after intervals varying from 14 to 31 days. Lymph was withdrawn from the site of the bite; bacteria were not found, but sections of the skin revealed a perivascular infiltration of the superficial plexuses

of the skin, no apparent change in the epidermis, but acid- and alcohol-fast bacteria were seen in the connective tissue spaces, not in the cytoplasm as is usual in leprosy. Whether the mosquitoes really infect at the time of biting, or whether the negative, burned-out cases (on whom these tests were tried) are not really "abacilliferous" but "paucibacilliferous"(*i.e.* still harbour a few organisms) or thirdly, whether the bite has set up a *locus minoris resistentiae* with consequent multiplication of a few local pre-existing organisms, which of these three hypotheses is the correct interpretation of the findings remains to be proved. [Abstract from Trop. Dis. Bull. **42** (1945) 1009.]

DHARMENDRA and MUKHERJI, N. Attempts to transmit human leprosy to splenectomized monkeys. Indian J. Med. Res. **32** (1944) 197-200.

After a brief review of previous claims to have infected splenectomized monkeys with human leprosy material, the authors record their own experiments. In the first series six *Macacus rhesus (Macaca mulatta)* had their spleens removed under chloroform, and after recovery each animal was inoculated intraperitoneally with an emulsion of clippings from the earlobes of advanced lepromatous cases, and the inoculation was repeated after two months. External examinations were made, with negative results, and lepromin tests were carried out 16 months later without producing any reaction at the site of inoculation. Post-mortem examination revealed no gross pathological lesions suggestive of leprosy infection; nor were there any acid-fast bacilli in slightly enlarged glands in one animal, or in a suspicious nodule found in the omentum of another. Claims (COCHRANE, *et al., Internat. J. Leprosy* **7**, 1937, 377) to have obtained positive results through such inoculations were, therefore, not confirmed. [Abstract from Trop. Dis. Bull. **42** (1945) 900.]

DHARMENDRA and MUKHERJI, N. The effect of sulfapyridine on experimental rat leprosy. Indian J. Med Res. **32** (1944) 201-3.

Variable results have been reported by different experimenters as to the effect of sulfonamides on rat leprosy bacilli. The authors report on a trial of sulfapyridine (M. & B. 693) ground up and suspended in normal saline and injected through an oesophageal cannula into the stomachs of rats. The dose was 10 mg. daily, gradually raised to 40 mg., in white rats weighing 80 Gm. The administration was commenced two or three days before inoculating the animals with the infective dose of bacilli, and was continued for several days, and after two weeks' interval, 10 to 20 mg. were given daily for another 2½ months. In the first series 18 were so treated and 20 used as control; but no differences in the nature or extent of the lesions were found. A second series with slightly different doses also yielded negative results. The drug therefore does not appear to have any inhibitory effect *in vivo* on *Myco. leprae muris*, although *in vitro* it has been shown to have a bactericidal effect in a dilution of 1 in 1,000. [Abstract from Trop. Dis. Bull. **42** (1945) 903.]

DOS SANTOS NEVES, E. Mais uma tentativa de tratamento do doente de lepra. (Another suggested treatment of leprosy.) Rev. brasil de leprol. **12** (1944) 247-51.

This short article is of the nature of a preliminary note with brief remarks on five cases of leprosy which had failed to respond to the customary treatment with chaulmoogra or which had had no previous treat-

ment, but which showed marked improvement and negative results to examinations for *Mycobacterium leprae* after the new treatment.

The idea arose from the report of a patient under Dr. Etcheverry in Buenos Aires, with definite signs of leprosy and bacteriologically positive, who after an attack of jaundice with desquamation appeared to be cured of his leprosy (no reference is given). The author then argued as follows: Vitamin A is the anti-infection vitamin and its absorption is facilitated by bile. Carotene is transformed into vitamin A in the liver: *M. leprae* is a resistant organism, as evidenced by its long latency and difficulty of inoculation into animals; abuse of remedies, even chaulmoogra, is prejudicial; spontaneous cure (i.e. cure by the unaided efforts of nature) sometimes takes place. Hence a rational mode of treatment would be to assist nature by administration of Vitamin A and a cholagogue. The author, therefore, started by using Decholin, a product of the Riedel Laboratory, and Vitamin A from the Dahr Laboratory; later, he used a cholagogue and carotene and carotenoid provided by the local laboratory. Injections were made intramuscularly three times a week. The results recorded are very striking. (But unfortunately nothing is said of the dosage, nor the length of time for which the treatment was maintained, nor of any follow-up of patients to see whether the improvement or cure with absence of bacteria was permanent.) [Abstract from Trop. Dis. Bull. 42 (1945) 472.]

FERNANDEZ, J. M. M. Importancia das reacoes imunologicas no exame das criancas comunicantes de leprosos. (Significance of immunological reactions in examination of child contacts of leprosy patients.) Rev. brasil de leprol. 12 (1944) 201-13, 2 figs. on 1 pl. English summary.

H. W. WADE has classified the results to individuals exposed to leprosy as follows:

1. The bacillus fails in its attack and is eliminated — a common event.
2. The bacillus enters but is checked and produces no symptoms; afterwards, according as resistance is maintained or breaks down, the infection may be eliminated, or remain latent, or give rise to symptoms.
3. Localized signs are produced which may persist without further development or may spontaneously disappear.
4. Clinical signs of a benign nature may ensue—nervous leprosy.
5. Clinical signs of a serious nature may ensue — lepromatous or cutaneous leprosy.

R. COCHRANE notes that children acquiring infection in infancy may go on to: (1) Progressive disease. (2) Do the same when resistance subsequently breaks down after a period of latency. (3) Show a stationary condition with a lesion checked and inactive, but evident. (4) The lesions may disappear completely.

After these preliminary statements the author goes on to describe the lepromin reaction and its interpretation: a positive indicating that the subject has been infected with the organism and is sensitized and that resistance is being offered so that the prognosis is favorable. *Per contra*, children reacting negatively call for rigorous supervision. It must be remembered, however, that infants, though living in close contact with patients,

only exceptionally react positively under 12 months of age. If after that time and in these circumstances the reaction is still negative, careful watching is called for "as the child may be incubating an infection of a malignant type." In those with obvious manifestations and a positive reaction the prognosis is favorable. In other words, a positive reaction indicates resistance. It is useful also retrospectively in that a healed cicatrized lesion, if leprous, will react with a local erythema. Further, it will reveal hidden lesions, as in a skin apparently normal; a subcutaneous injection of 0.5-0.75 cc. may in 24 hours show up a number of erythematous blotches, quite unsuspected.

We may sum up the information derived from the lepromin test as follows:

I. *Patient showing active lesions.*
   - (a) *Lepromin reaction positive:* Prognosis good; strict vigilance not needed.
   - (b) *Lepromin reaction negative:* Make bacteriological examination. If the organisms are not found, watch the case carefully and repeat the test periodically. Anyway it is advisable to start treatment with chaulmoogra.

II. *Patient showing residual lesions.*
   - (a) *Lepromin positive:* As in I (a).
   - (b) *Lepromin negative:* Watch the case carefully: repeat the test.

III. *Patient showing no obvious lesions.*
   - (a) *Lepromin positive:* Note signs of early, healed lesions. As in I (a).
   - (b) *Lepromin negative:* Careful watching; repeat test periodically. Start specific treatment with chaulmoogra if clinical signs appear. If the reaction continues negative, give a guarded prognosis.

(See Trop. Dis. Bull. **32** (1935) 862; **36** (1936) 692; **37** (1940) 335; **38** (1941) 703; **39** (1942) 226, 227, 696; **40** (1943) 245, 316-17, 548, 786.) [Abstract from Trop. Dis. Bull. **42** (1945) 472.]

GRAU TRIANA, J. Nuevo fundamento y técnica para el cultivo del *Mycobacterium Leprae.* (New basis and technique for cultivation of *Mycobacterium leprae.*) Rev. Leprologia Dermatologia y Sifilografia, Marianao, Cuba. 1 (1944) 230-35, 1 fig.

An interesting description of an apparently logical procedure for cultivation of Hansen's organism for which the author claims success; as it can be easily verified (or disproved) by other workers, a full account is called for.

The author sketches briefly previous attempts to grow *M. leprae* and notes thereanent three points: (i) Their want of uniformity. (ii) the low percentage of positive results. (iii) The lack of confirmation by other workers. His line of argument is as follows: Hansen's organism strongly resembles that of tuberculosis in many features; why will not the former grow under conditions apparently the same as those which give a good yield of the latter? Study of this revealed that *Mycobacterium tuberculosis* has several diastases — oxidase, catalase, esterase, tryptase, nuclease, reductase, and a peptic ferment. *M. leprae* on the other hand is poor in

these and little is known about them. The next stage was to examine the general conditions in which cultivation has been carried out and the special properties of these diastases. Briefly, sterilization of the media for growing *M. tuberculosis* is usually carried out at 20 lb. pressure (127° C.) for 15 minutes or at 15 lb. (121° C.) for 20 minutes. Now oxidase action is inhibited by cold, but almost destroyed by heat, such as 60° or 70° C. for 10 minutes. We are not, therefore, dealing with a medium deficient in "chemical nutrients" but with one "biologically dead." *M. tuberculosis* can live and thrive in such a medium because the organism itself contains diastases in plenty, whereas *M. leprae* needs a medium with full enzymatic activity and therefore these must be added. A long series of experiments with oxidases, reductases, catalases and tryptases added to Petragnani's medium has shown that the essential is the first-named. The authors next discuss Keilin's work with Warburg on the cytochromes and conclude that Koch's bacillus is a "typical and complete aerobe with its full complement of cytochromes," whereas Hansen's bacillus is a "facultative organism in which cytochrome oxidase is poor or lacking." On this basis he has used Petragnani's medium (but substituting peptone for the asparagin) and, after confirming its sterility by keeping it at 37° C. for 48 hours, adds, at the moment of sowing the organism (from emulsified lepromata, for example), 10 drops of a solution of oxidase from potato, which has been kept in the ice-chest. Care must be taken to ensure that the whole surface of the medium is bathed in the oxidase solution before the leprous material is sown. Laboratory details for preparing the oxidase solution are given. By this technique, says the author, colonies begin to appear in 5-7 days at 37° C.

Bearing in mind the avidity of certain salts, ferrous salts, for example, for oxygen, the author has tried adding a solution of ferrous sulphate, with good results. In a flask containing 50 cc. of distilled water is placed a "very small quantity of pure ferrous sulphate, for analysis." The solution is shaken and filtered, first through paper and then through an L_3 bougie into a sterile flask. This solution will not keep and must be freshly prepared each time just before use. It is added to the medium in the same quantity as the oxidase, 10 drops to each culture tube. [Abstract from Trop. Dis. Bull. 42 (1945) 213.]

JUON, M. Les dernier cas de lèpre autochtone en Suisse. (The last indigenous cases of leprosy in Switzerland.) Schweiz med. Wchnschr. 74 (1944) 795-800.

This paper is mainly of historical interest. In 1898 JADASSOHN discovered a focus of leprosy at Guttet, the last case of which has now disappeared. In the middle ages Switzerland suffered severely from leprosy, records of which still exist, and in 1898 four cases were found in Guttet among persons who had never left their village since their birth, constituting an endemic focus of the disease. Two were lepromatous cases in a brother and sister of 10 and 14 years of age, one was a lepromatous case in a man of 47 and the fourth a mixed case in a youth of 17; all four patients were closely related, as shown by a genealogical table. These cases occurred among a population of 200 people in an isolated area. In the village of Feschel, not far away, two other cases had occurred in one family and here the disease was traced back for one hundred years, with a history of seven cases in four generations only two of which still sur-

vived in 1907, by which time three of the total of six verified cases had ended fatally. In 1921 three remained, but in 1922 two new cases were reported, making a total of five. Four of these are described in detail and illustrated by photographs: two were advanced lepromatous and one a third-stage neural case. All these patients had died by 1927, thus bringing the disease to an end. The persistence for so long of this focus of infection is attributed to the poverty and backward social and hygienic conditions of the inhabitants of these remote villages. [Abstract from Trop. Dis. Bull. **42** (1945) 390.]

LINHARES, H. Estudo sôbre a celula leprosa do rato. (Study of the lepra cell in the rat.) Mem. Inst. Oswaldo Cruz. **40** (1944) 183-9 (17 refs.) English summary.

As long ago as 1921 GUJO found that carmine and trypan-blue when injected were taken up by lepra cells. The author has now studied these cells and their staining affinities. He took eleven infected rats and divided them into two lots. Five were injected with lithium carmine freshly prepared, at 2-3 day intervals on four occasions: first, 1 cc. subcutaneously, the next two 0.5 cc. intraperitoneally, and lastly, 0.3 cc. intracardially. The remaining six received injections of 1 per cent trypan-blue, subcutaneously, intraperitoneally, and intracardially. The animals were killed at intervals and sections of the tissues stained. It was observed that the cells containing the bacilli were the ones which took on the stain, that these were reticulo-endothelial cells, histiocytes, and the stages could be seen of these cells becoming transformed into the typical lepra cells. [Abstract from Trop. Dis. Bull. **42** (1945) 394.]

MARIANO, J. Resultados do emprêgo das leprolinas "Souza-Araujo" comparativamente com o da lepromina. (Comparison of leprolins "Souza-Araujo" with lepromin [as regards intradermal tests].) Mem. Inst. Oswaldo Cruz. **40** (1944) 101-91, 1 fig.

Five leprolins were obtained: one from a leprosy patient, one from a guinea pig inoculated with the primary culture, two from culture from *Amblyomma cajennense*, and one from *Boophilus microplus*. These were inoculated in amounts of 0.2 cc. and compared with a similar inoculation of lepromin. The tests were carried out on 10 groups of patients, namely L_1 (8 cases), N_1 (7), N_2 (3), N_3 (6), L_1N_1 (11), L_2N_2 (3), L_1N_2 (14) L_2N_1 (16), L_3N_1 (19), L_3N_2 (4). Protocols show the results of four consecutive weekly readings in each case. For purposes of this abstract, the readings (which total more than 2,000) must be grouped. In the L_1 cases, leprolin 4 (a strain from *Amblyomma cajennense*) gave reactions identical with lepromin, the other gave differing readings; in group II, the N_1 cases, again leprolin 4 gave the same as lepromin; in the N_2, a group of only three cases, leprolin 2 (the guinea pig strain) agreed with lepromin; among the N_3 cases again lepromin and leprolin 2 were in harmony; in the L_1N_1 patients, lepromin was negative in all. None of the leprolins agreed with this, but Nos. 3, 4, and 5 all gave 9 negative and 2 positive. Among the three L_2N_2 patients lepromin agreed with leprolins 1 and 3 (the direct culture and one of the *Amblyomma* cultures), while leprolin 4 (the other *Amblyomma* culture) was negative with all three; in the L_1N_2 group, leprolin 3 gave one positive and five negative, whereas lepromin and all the other leprolins gave a negative, (only six are referred to in the letterpress

on this group, although in the table 14 are given.) The L_2N_1 group we cannot speak of with certainty for the letterpress states that there were 24 patients in the group, whereas the table gives details of 16 only; anyway none of the leprolin results corresponded exactly with those of lepromin. In the L_3N_1 group of 19, lepromin was negative in all; the nearest approach to this was leprolin 3 with two positive. All four of the L_3N_2 group were negative with lepromin, while of the leprolins, No. 2 was positive in two and negative in two, the other four leprolins being negative in three.

In another group of three contacts lepromin was positive in all, as were also leprolins 2 (guinea pig), 3 (an *Amblyomma* strain) and 5 (the *Boophilus* strain). Among another group of children in the Preventorium, leprolins 2, 3, 4, and 5 gave the same total results, two positive, four negative, as lepromin, but the individual readings differed.

Bringing these results together, the author in his summary states that in the neural cases lepromin gave a positive in 13 and negative in 3, while leprolin 2 was positive in 12 and negative in 4; in lepromatous patients lepromin was positive in three, negative in 72; the leprolin most nearly approximating this was No. 3, with 16 positive and 59 negative.

To obtain a closer comparison it is thought necessary to make a fresh series of tests with graded doses of the leprolins; the author concludes that the leprolins "can play a fundamental part in the prognosis of leprosy since the reactions enable evaluation to be made of the defensive powers of an individual patient. [Abstract from Trop. Dis. Bull. 42 (1945) 1011.]

MESTRE MIYARES, J. J. Clasificacion Sud-americana de la lepra. (South-American classification of leprosy.) Trans. Primera Conferencia Cubana de Leprologia, Santa Clara, Cuba, Abril 1 y 2 de 1944, 13-21.

A satisfactory classification of leprosy is important from the aspects of prognosis, of treatment, and of prophylactic control. Leprosy being especially prone to attack the skin and peripheral nerves (though other tissues and organs, of course, do not escape) it has been, and is, customary to divide cases into cutaneous, neural, and mixed. The author, while not criticizing this classification, is all in favor of the following, on an anatomo-pathological basis: (1) Lepromatous; (2) Tuberculoid; (3) Non-specific. He details the characters of each of these from the aspects of (i) Pathological anatomy; (ii) Clinical features; (iii) Bacterioscopy; (iv) Immunology. The first is characterized by lepromata and infiltrations crowded with bacilli; it is highly infective and of severe type, anergic, giving a negative Mitsuda reaction. It does not as a rule, in the early stages at all events, affect the general health, and the patients can do quite heavy work, but they must be segregated, either in their houses or in colonies, under supervision and strict hygienic conditions. They do not respond well to treatment by chaulmoogra.

The second type is in many respects the converse of the first. These patients present reddish discolorations, sometimes raised or merely macular with infiltrated borders and small nodules, "micropapuloids," the lesions are follicular, limited, and contain few bacilli, corpuscular sedimentation is within normal limits, the lepromin test is usually positive, the body is putting up a good resistance; these patients are not contagious, they can carry on work with their fellows and, with certain precautions, can live at home; they respond to chaulmoogra treatment and may be cured.

The third, non-specific, type presents achromic patches or level erythematous maculae, varying in number, slightly, if at all, infiltrated, with definitely marked edges; the peripheral nerves are enlarged and indurated. In this form one sees the *main-en-griffe*, the perforating ulcer, bone absorption, etc. Whereas it is rare for the malignant lepromatous form to become the benign tuberculoid, there are three possibilities for the third type: It may remain true to itself, or may pass over to either of the other two. The nasal mucus and the skin lesions show bacilli in about half the cases, the lepromin reaction is positive in about the same proportion (some say 60 per cent). If the hygienic surroundings are good, the diet adequate, qualitatively and quantitatively, and the treatment be persisted with, the outlook of these cases is favorable. [Abstract from Trop. Dis. Bull. 42 (1945) 43.]

MIRANDA, R. N. Resultados comparativos das reãcoes intra-dermicas com antígenos de bacilos ácido-alcool-resistentes (Leprolinas "Souza-Araujo") a emulsão de lepromas (Lepromina). Primeira nota.) (Comparison of the results of intradermal injection of "Souza-Araujo" leprolins and lepromin. [First Communication.]) Mem. Inst. Oswaldo Cruz. 41 (1944) 195-200. English summary.

The author carried out tests similar to the above, on 20 patients, 17 males, 3 females, 13 lepromatous and 7 neural or tuberculoid types, at the São Roque Colonial Hospital, Paraná State, Brazil. He obtained his samples of leprolins from Professor de Souza-Araujo. Readings were taken after 48 hours and at the end of each of the first 4 weeks. The results were, in general, in fairly close agreement with those of de Souza-Araujo, namely, positive in the neural, negative in the lepromatous cases. As a rule no constitutional disturbance resulted from the inoculation, but many of the patients showed a scar at the site of inoculation, indicating local destruction of tissue, although there was no preceding ulceration. In one, the lepromatous lesions tended to become confluent after the inoculation. [Taken from abstract from Trop. Dis. Bull. 42 (1945) 1012.]

MONEY, T. D. F. Abstract of a further report on the Oji River Leprosy Settlement, Nigeria. Leprosy Rev. 15 (1944) 50-52.

This report on the work of 1938 to 1943 amplifies the information in one that was reviewed in *Trop. Dis. Bull.* 41 (1944) 587. This settlement deals with the Onitsha Province of Nigeria, with a population of over one million in 5,000 square miles. In 1943 the central settlement provided residence for 1,187 patients, all highly infective except for some advanced nerve cases requiring special care. In the surrounding territory a number of out-patient clinics provide regular treatment for from several hundred to one thousand earlier cases at each, with a total yearly attendance of 305,793. The province is estimated to have from 20,000 to 25,000 active cases, of which 3,000 to 5,000 are highly infectious, requiring isolation. Some live in villages in which only infectious patients reside, and many more are isolated in their homes.

The child adoption scheme of B.E.L.R.A. provides for about 100 infected children in a special compound, and others are paid for by their parents. The indications are that few patients with active disease fail to attend the clinics in order to obtain treatment, but full surveys have not yet proved possible. Bacteriological examinations of 372 cases in 1941-43

showed: negative throughout 79.2 per cent; positive throughout 9.4 per cent; becoming negative, 9.2 per cent, and becoming positive 2.2 per cent. The work has steadily increased in spite of war-time difficulties. [Abstract from Trop. Dis. Bull. **42** (1945) 392.]

MUIR, E. Leprosy in Antigua. (2nd Report) Leprosy Rev. **15** (1944) 35-40.

At this, Dr. Muir's second visit, in July 1944, he is able to report some progress since his first inspection in January 1942 (see *Trop. Dis. Bull.* **40** (1943) 463). Changes have been made in the Leper Act and Rules on the lines recommended in the former report, and there has been more following of contacts, leading to earlier segregation of infectious cases. This is shown by an increase in the Leper Home of L_1 and L_2 cases from 2 to 13 and of L_3 cases from 16 to 19, accompanied by a decrease of active nerve cases from 11 to 8, and an increase of the total cases from 37 to 48. In addition, arrangements have been made to place 27 closed neural cases under treatment outside the Home. Another 14 arrested cases are living in their own homes under supervision; the total known cases now number 90. Improvements have also been made in the staff, including the provision of a matron with two years' training at the Trinidad Leper Settlement. The patients have gardens, but their diet is still deficient in vegetables and fruit. The cost of segregation amounts to £52 a head annually, including £24 for food. The control of leprosy by up-to-date methods is thus important from the financial as well as from the public health point of view. The difficulty in supplying a properly qualified staff for combating leprosy in such a small island as Antigua, and most of the West Indian Islands, is pointed out, and although the Trinidad settlement is prepared to take a certain number of cases suitable for treatment, there remains the difficulty in persuading patients from other islands to avail themselves of this offer. [Abstract from Trop. Dis. Bull. **42** (1945) 390.]

MUIR, E. Second report on leprosy in Jamaica. Leprosy Rev. **15** (1944) 43-9.

This visit was made in October 1944 to follow up the results of a former one in August 1942 [*Trop. Dis. Bull.* **40** (1943) 462.] In the interval new wards had been constructed for male patients, which will relieve the overcrowding when they can be opened. An entertainment hall and new kitchen have also been supplied, so some progress in this direction has been made. Unfortunately, the most important recommendation of the earlier report, namely the revision of the Leper Asylum Law to "circumvent its most harmful clauses" and to allow modern methods of leprosy control by finding and treating early uninfective cases at dispensaries, is still awaiting urgently needed action, after having been recommended at three earlier visits by leprosy experts since 1926. The Medical Attendant has not yet been sent for training in leprosy work. Former recommendations for the supply of surgical instruments, a microscope, etc., have not been complied with. In respect to leprosy legislation, Jamaica, the largest and wealthiest of the West Indian islands, is behind other British Colonies in this area, and should frame new laws based on those not long ago adopted by Trinidad. Small rehabilitation grants should be supplied to discharged uninfective neural cases. As an example of the need for the early adoption of modern methods it is mentioned that there are 17

known unsegregated lepromatous cases who are living in contact with 47 children under the age of 15 years! They should be isolated without further delay. Moreover, there are several patients in the asylum who could be rendered fit for discharge before long by efficient intradermal treatment with hydnocarpus oil. A considerable amount of examination of contacts has been carried out, but for such a large island a whole-time leprosy expert must be supplied if good progress in reducing the disease is to be made. That will prove to be an economy in the long run. [Abstract from Trop. Dis. Bull. 42 (1945) 391.]

MUIR, E. Leprosy in St. Kitts and Nevis. (2nd Report) Leprosy Rev. 15 (1944) 40-43.

In July 1944 Dr. Muir paid a second visit to these islands to see the results of his report on his first visit in February 1942 (see *Trop. Dis. Bull.* 40 [1943] 463.) A new Master of the Leper Home has been appointed after being trained at the Trinidad Chacachacare Leprosarium with advantage, but little other progress appears to have been made. The total cases in the home have only risen from 46 to 49 by the addition of three neural cases. The active lepromatous cases remain at 27, but the new admissions amount to 13, because 10 patients have died in the interval between the visits. There are, however, about 27 known active cases, including 7 or 8 lepromatous ones, outside the Home, and other cases isolated at home require more supervision. The surgery premises are inadequate, a treatment room with running water being badly needed, and more land is needed for cultivation by the inmates. Several of the nerve leprides might be cleared up by intradermal treatment; this also applies to extramural cases. The fact that some fresh cases were detected during a short visit indicates that there are still active cases at large. No mention is made of the regular examination of contacts, which is essential for detecting new cases in an early stage. [Abstract from Trop. Dis. Bull. 42 (1945) 390.]

OLMOS CASTRO, NORBERTO. Annual report of the anti-leprosy campaign section for Tucuman Province, Argentina, for the year 1944. 43 page pamphlet. Provincial Health Department Publication.

Dr. Castro as director of the anti-leprosy department reports that during 1944, 45 new cases were recorded. Of these 31 were of the tuberculoid type, 13 lepromatous and 1 of indefinite type. There are now a total of 102 patients on the register. It is interesting to note there is a higher proportion of cases found among contacts who were brothers of the patient. There is a higher incidence from contact of children to parents than from parents to children. The report also discusses the anti-leprosy campaign plan for the Province of Tucuman.—G. BASOMBRIO

ROIG, J. T. and RODRIGUEZ, J. M. Los aceites de las flacurciáceas: sus propiedades. Aceites de las flacurciáceas Cubanas. (The essential oils of the *Flacurciaceae* and their properties. The oils of Cuban species.) Rev. Leprologia, Dermatologia y Sifilografia. Marianao, Cuba. 1 (1944) 256-66. (16 refs.)

By "properties" the authors imply the physical characters, not the therapeutic uses, of the various plants. They give the specific gravity at certain temperatures, the refractive index, the rotatory power, the index of saponification, etc., of the twelve chief species of *Taraktogenos* and *Hydno-*

carpus (among the latter, *wightiana, anthelmintica, alcalae, hutchinsonii, ilicifolia, woodii,* and *subfalcata*) and then give the same information regarding the species which flourish in Cuba, namely, Guaguasi oil, *Zuelania guidonia;* oil of Ranilla, *Laetia americana;* oil of Rascabarriga, *Samyda grandiflora;* oil of Jia blanca from the seeds of *Casearia alba,* and of Raspalengua obtained from *Casearia hirsuta.*

The oils of these three general, *Zuelania, Laetia* and *Casearia* are very similar to those of *Hydnocarpus, Lindackeria* and *Carpotroche,* and in all of the Cuban plants gynocardic, chaulmoogric and gorlic acids are present. Moreover, as far as they have been tried, the esters of these Cuban oils are well tolerated when injected intramuscularly, and a plea is made for more extensive trial of them and for publication of the results observed. [Abstract from Trop. Dis. Bull. **42** (1945) 214.]

ROTBERG, A. Valor prognostico da lepromina-reacão de Mitsuda. Observacão de 455 casos durante 5-6 anos. (Prognostic value of Mitsuda's lepromin reaction.) Rev. brasil de leprol. **12** (1944) 367-77, 2 charts. English summary.

From among a large number of persons on whom the lepromin reaction had been carried out during 1936-37 the author has followed up 445 who were in good state physically, were bacterially negative and were undergoing out-patient treatment at dispensaries. This follow-up has continued for 5-6 years, to 1942. Of this total 323 have shown no clinical change and have remained bacterially negative, 86 have developed symptoms of the lepromatous type of evolution—fresh maculae, infiltrations, bacteria present. Twenty-seven have undergone tuberculoid development — annular lesions, sarcoid, but bacterially negative; nine are "not characteristic"; they present fresh maculae and are bacterially negative and cannot be placed in either of the other two groups [see Trop. Dis. Bull. **31** (1934) 12]. The accompanying table gives the results of the lepromin reactions in these cases:

Lepromin Reaction	Lepromatous	Reactivation not characteristic	Tuberculoid	Unchanged	Total
—	54	6	2	29	91
+	32	3	5	61	101
++	0	0	13	93	106
+++	0	0	7	140	147
Totals	86	9	27	323	445

From this it will be seen that among 91 lepromin-negative cases there were, in percentages, 59.3 lepromatous, 6.6 non-characteristic, 2.2 tuberculoid; 31.8 were unchanged; among the 101 giving the one plus reaction the percentages are practically those written as totals; of the 2-plus 12.2 per cent were tuberculoid, while 87.8 were unchanged, and of the 3-plus 4.7 per cent were of the tuberculoid type.

In a similar way the author has investigated 182 non-characteristic cases and table II gives the results of these:

Lepromin Reaction	Lepromatous	Reactivation not characteristic	Tuber-culoid	Un-changed	Total
—	10	5	2	4	21
+	11	1	2	30	44
++	0	0	7	52	59
+++	0	0	1	57	58
Totals	21	6	12	143	182

Detailed observations on these are not necessary, but it will be seen how marked is the tendency for negative or one-plus reactions to relapse with the lepromatous forms. The author concludes: "These results confirm the possibility of the prognostic utilization of the LT (Lepromin test), which would permit the prophylactic services to concentrate on the follow-up of the negative and weak positive reactors, prone to frequent relapses of the contagious type." [Abstract from Trop. Dis Bull. **42** (1945) 569.]

SAGHER, F. Effect of grenz rays on leprous infiltrations. Report of an attempt to influence leprous infiltrations by roentgen rays of long wave length. Arch. Dermat. & Syph. **50** (1944) 311-14, 2 figs.

The author points out that early trials of roentgen and radium rays in the treatment of leprous nodules were rather unfavorable and might cause severe damage to the surrounding skin and underlying organs. He has therefore tried the far less dangerous grenz rays in doses of 600 to 8,000rk, in a single exposure or in several fractional exposures, in a total of 18 selected cutaneous areas, all of which showed numerous lepra bacilli before treatment. The recorded details of repeated exposures in two well-developed mixed cases showed that only doses of 2,000r. and upwards were effective, larger doses being used in proportion to the amount of infiltration of the selected erythematous patches. After four months to one year the skin lesions became clinically free from symptoms, but the general course of the disease was not modified, although, when new cutaneous lesions appeared, almost all the irradiated areas were spared and the advance of the process halted abruptly at the border of the treated areas. Moreover, histological examinations showed that both the cellular infiltration and the number of Hansen's bacilli were greatly decreased in the treated areas as compared with the immediately surrounding unexposed skin lesions. The author therefore advises the use of grenz rays in the case of disfiguring lesions, especially those on the face. [Abstract from Trop. Dis. Bull. **42** (1945) 741.]

SANTRA, I. The problem of leprosy in the Tehri Garhwal State, U. P. Leprosy in India. **16** (1944) 118-22.

Tehri Garhwal is an Indian State (Himalayan) situated at the extreme northwest corner of the United Provinces. Like all the Himalayan area it has a much higher leprosy rate than that of the adjoining plains on account of its more humid climate; at least 138 cases of leprosy from this State were recently found in leper asylums of British India. In 1916 the State authorities began to control the disease and were helped by an ancient custom of using some kind of segregation of advanced cases on the

outskirts of the villages. In 1916 orders were issued to enforce village isolation more rigorously and in case of failure the patients were taken by force to a colony opened at Barahat and were maintained there at the cost of the relatives; but early in January 1917 only 19 inmates were found there in place of an expected number of 117, owing to the failure of the relatives to pay for their upkeep. In 1919 it was ordered that the relatives of the patients should contribute a fixed amount of food when the harvest was ripe, or pay an equivalent in money, but this plan also appears to have failed as there were no cases at Barahat recently.

In 1943 the State authorities asked for the help of the Indian branch of B.E.L.R.A. and a research worker was sent to make a study and a survey of villages known to be infected, with the result that an incidence of 2.05 per cent was found among 7,082 people examined. Of 117 cases 45 per cent were infectious. A colony at Munikirti provides accommodations for 157 cases without treatment. Children up to 14 years formed only 4.2 per cent of the whole, and mild tuberculoid cases 20 per cent. Only 16 patients were found to have been isolated outside villages, 11 of them with uninfective neural lesions. It is advised that only infective cases should be admitted to the Munikirti colony, under the charge of a medical man trained in leprosy work, who could carry out treatment. [Abstract from Trop. Dis. Bull. **42** (1945) 393.]

SHAMA RAO, A. A simple method for the preparation of iodized hydnocarpus oil. Leprosy in India. **16** (1944) 116-17.

The author has used the following simplified method of preparation of iodized hydnocarpus oil with satisfactory results: 40 grains of pure iodine are added to 1 oz. 2 dr. of pure ether in a 2 oz. stoppered bottle and shaken well for about a minute. The iodine dissolves and the iodized ether is added to 1 lb. of sterilized and cooled pure hydnocarpus oil. On shaking, the resulting iodized oil is a brown color and can be used immediately for injections. On exposure to air or sunlight, the oil loses its transparency and becomes a dirty green color after two weeks, but does not show the presence of any free iodine, and no precipitate forms. Although the author prefers to use the freshly prepared iodized oil, he found the green samples equally effective in treatment and either may be injected subcutaneously or intradermally twice a week in the usual doses; the freshly prepared iodized oil is easier to inject than the pure oil. He has used this method for four years in a very large number of cases of leprosy; early cases of both types respond favorably. [Taken from abstract from Trop. Dis. Bull. **42** (1945) 394.]

SILVEIRA, L. M. Patogenia do mal perfurante plantar. (Pathogeny of perforating ulcer of the sole.) Rev. brasil de leprol. **12** (1944) 255-66, 13 figs. on 6 pls.

Perforating ulcer of the sole has (theoretically, according to the author) been ascribed to nerve or vascular lesions, to dyscrasiae or certain intoxications, but it is difficult to say what part each of these may play in the pathogeny of plantar ulcers. Briefly, the author will not have anything to say for any of them except in so far that the initial phenomenon is loss of sensation of pain. That being so, any wound goes unperceived and consequently untreated and infection is superadded after which destruction of tissues, soft tissues and even bones, proceeds apace. If seen in the early

stage the ulcer should be treated on the lines proper to any wound, by cleanliness and rest and thereafter careful observation to see that the healing does not break down owing to the analgesia. If the patient does not come for treatment till later, surgical intervention will be necessary and, in many cases, amputation. There are photographs showing the condition before treatment and results of surgery. [Abstract from Trop. Dis. Bull. 42 (1945) 473.]

SLOAN, N. R. Early diagnosis of leprosy, as seen in Hawaii. Hawaii Med. J. 3 (1944) 111-20, 4 figs.

The paper deals with the subject generally and the author agrees with medical opinion regarding transmission, and race, sex, and age incidence. He claims that compulsory segregation is effective in Hawaii, and that the decline in known active lepers from 1,175 in 1890 to 390 in 1943 is evidence of this. A careful analysis is given of the symptoms in 743 cases, which shows the following frequency of the more common symptoms: Macules (spots and blotches) 344, nodules 97, anesthesia 64, ulcers 53, swelling of skin 44, muscular weakness 31, contracture of fingers 28, erythema 17, etc. The early symptoms are then described on the usual lines and the methods of examination given. These will be useful to those without much experience of the disease. [Taken from abstract in Trop. Dis. Bull. 42 (1945) 296.]

DE SOUZA, A. R. Sindromo de Claude Bernard-Horner na lepra. (The Claude Bernard-Horner syndrome in leprosy.) Rev. brasil de leprol. 12 (1944) 379-82.

Three signs characterize the Claude Bernard-Horner syndrome: ptosis (or pseudoptosis), enophthalmia, and myosis; to these may be added varied pigmentation of the iris (heterochromia) and lowered ocular tension. Under these conditions pinching of the skin of the neck fails to cause dilatation of the pupil, the eye symptoms are not affected by instillation of cocaine, but local application of atropine, by lowering the tone of the iris, results in disappearance of the myosis. The syndrome is due to sympathetic affection, but may be found in those of the medulla, the nerve roots or the ganglia.

The patient in whom this was observed and whose case is here recorded was a Spaniard, aged 56 years, from S. Paulo. The first sign of leprosy which he noticed was anesthesia of the left thumb, when he was 40 years old. Now the signs are well developed—infiltration of the ears, cheeks, nose, and supraciliary ridges, maculae on arms and trunk, etc. Leprosy bacilli were found in the nasal mucus and the skin lesions, blood Wassermann and Kahn were 3-plus, spinal fluid negative.

In the discussion the author enumerates the causes of the syndrome, or the conditions in which it occurs, such as wounds of the sympathetic, compression by enlarged thyroid or lymphatic glands, lymphosarcoma, granuloma, abscess, vertebral lesions, aneurysm, carcinoma of oesophagus, pleural adhesions, syringomyelia, tabes. He states that in these cases none of these was discoverable and "syphilis, tuberculosis, and tumors were looked for without result" (but his serum gave a 3-plus to the Wasserman and Kahn tests) and he wonders whether leprosy itself may cause it. He has examined 800 leprosy patients in the Santo Angelo colony, but found no other like the one he records. [Abstract from Trop. Dis. Bull. 42 (1945) 568.]

DE SOUZA-ARAUJO, H. C. Verificacão da infeccão de moscas da familia *Tachinidae* pela *Empusa* Cohn 1855. Essas moscas, sugando ulceras lepróticas, se infestaram com o bacilo de Hansen. (Infection of *Tachinidae* by *Empusa* and Hansen's Bacillus.) Mem. Inst. Oswaldo Cruz. **41** (1944) 200-300, 3 figs., English summary (8 lines).

On an ulcerous lesion of the left external malleolus of a leprosy patient a large number of flies were feeding. Some were captured and were diagnosed as *Tachinidae;* they were too few for the species to be determined, but it was thought that they were of several species. They were all dead by the following day and in their intestines were acid- and alcohol-fast bacteria mixed with the fungus *Empusa.* Cultures of the bacteria on Löwenstein's medium were attempted, but time was allowed to elapse and they were overlooked. The work is to be taken up again. [Abstract from Trop. Dis. Bull. **42** (1945) 1008.]

DE SOUZA-ARAUJO, H. C. Culturas de bacilos ácido-álcool resistentes isolados de hematófagos infectados em leprosos. Evidências de se tratar do bacilo de Hansen. (Culture of acid- and alcohol-fast organism from blood-sucking insects which have fed on leprosy patients. Evidence that these are cultures of Hansen's Bacillus.) Mem. Inst. Oswaldo Cruz. **40** (1944) 9-31, 20 colored figs. on 1 pl. and 40 text figs. English summary.

The author has made a series of cultures primarily from human leprosy lesions and secondarily from the blood-sucking insects which have fed on leprosy patients, or from animals (guinea pigs and white rats) inoculated with the primary cultures. He has succeeded in obtaining 7 cultures: (1) The primary one direct from a patient (he obtained subcultures from this by inoculation of guinea pigs and white rats.) (2) Two isolated from *Amblyomma cajennense* which had been allowed to feed on leprosy patients; two from *Boophilus microplus* similarly obtained. (3) Two from Triatomidae, *T. infestans* and *Panstrongylus megistus.* The characters of the growth have already been described and they are well shown in a colored plate of 20 figures. Penicillin which acts so potently on some gram-positive bacteria, has no effect on this organism. [Abstract from Trop. Dis. Bull. **42** (1945) 1008.]

DE SOUZA-ARAUJO, H. C., MARIANO, J., and DE OLIVEIRA CASTRO, G.M. Tentativas de transmissão da lepra ao homem, por meio de Triatomídeos infectados em doentes lepromatosos. (Nota previa.) (Attempts to transmit leprosy to man by Triatomidae which had fed on leprosy patients.) Mem. Inst. Oswaldo Cruz. **41** (1944) (495-505, 4 figs., English summary.

Professor de Souza-Araujo has already demonstrated that Triatomidae, *T. infestans* and *Panstrongylus megistus,* after feeding on a leprosy patient, harbored bacteria which were acid- and alcohol-fast and could be grown on Löwenstein's medium. With his fellow-workers he has now studied whether these insects, thus infected, can later infect human beings. To test this they bred *T. infestans* and *P. megistus* in the laboratory till they were sufficiently developed to bite man, when they were allowed to feed on burned-out leprosy patients. Five months later a few acid-fast bacilli could be seen in the lymph lying under the site of the bite—not a

very satisfactory result so far, but the patients are being kept under observation for further study. (Not a very satisfying paper; if the disease does develop, it may be looked upon as a lighting-up of a condition believed to be burned-out and if it does not the question arises whether a burned-out case is re-infectible.) [Abstract from Trop. Dis. Bull. **42** (1945) 1009.]

TRESPALACIOS, F. and JOVER, J. Notas sobre los niños nacidos en el Hospital "San Lazáro" Rincón, Cuba. (Notes on children born at the San Lazaro (leper) Hospital, Rincón, Cuba.) Rev. Leprologia, Dermatología y Sifilografia. Marianao, Cuba. **1** (1944) 193-8.

The authors discuss the hereditary or congenital transmission of leprosy and give brief notes of a series of 16 children born of leprous parents in the Leper Hospital, Rincón, Cuba. Their investigations were carefully carried out. PINEDA had recorded examining smears of the placenta and the centrifuged washings of it and finding among 104 such examinations 57 placental smears and 15 of the washings positive for lepra bacilli. In the present series of sixteen the parents were known to be leprous and examinations were made of the placental tissues, the umbilical cord, blood from the cord, and thick drops from the ear-lobe in each case. Six died at birth or soon after; nine are living and well; the ages of these ranged up to 8 years. Another could not be traced, for the mother refused to say where the child was. Those who died showed no signs of leprosy, the causes being obstetrical difficulties in the case of those born dead, others of gastroenteritis, bronchopneumonia, etc., later. None of the examinations revealed any lepra bacilli. The living babies were removed from their parents to a home or other place of safety and they have, with the one exception mentioned, been kept under observation. All have so far remained free from any sign of leprosy. [Abstract from Trop. Dis. Bull. **42** (1945) 212.]

VAN DER SAR, A. Lepra en las Antillas Neerlandesas. (Leprosy in the Dutch West Indies.) Rev. Policlinia Caracas. **13** (1944) 169-85, 4 figs.

The first authentic records of leprosy in the Windward Islands date from 1764. During the French occupation of St. Martin and St. Eustatius a leprosarium was established under the name "Hen and Chickens." When the French left, about 1780, the patients were transferred to one of the islands near Guadeloupe, probably the Isle des Saints. Later, fishermen going from here spread the infection elsewhere. According to EHLERS, leprosy was present in San Domingo in 1500, probably imported by slaves from Africa, but it must be remembered that sailors, chiefly Spanish and Portuguese, visited the islands and might import infection. The slave trade to St. Eustatius began about 1644; it may have been earlier, but there exists a letter of that time asking for 200-300 slaves for that island and St. Croix.

In 1801, during the English occupation, a decree was issued for leprosy patients to keep to their own houses; in 1803 it was made penal for them to appear in the streets. The first case known in Saba was recorded in 1840 as having been imported from St. Kitts.

The number of patients has always been greater in the Windward than in the Leeward Islands. In 1903 the leprosarium at St. Martin was falling in ruins, so it was closed and the inmates were moved to St. Eustatius. In 1920 this was suppressed and since then all patients from the Wind-

ward and Leeward Islands have been sent to the Zaquito institution in Curacao. To the Leeward Islands leprosy came first, probably from South America *via* Colombia, with the slaves, or was brought by the Portuguese coming with their slaves from Brazil in 1659.

At the beginning of the nineteenth century leprosy patients in St. Martin were treated with the oil extracted from the seeds of *Jatropha curcas* (the Physic Nut tree); it has a purgative action like that of croton oil, but not so drastic. Doubtless a certain number of deaths were attributable to it and, on account of the pain it produced, it never became very popular. Later, chaulmoogra oil was used with a diet rich in vitamins and with yeast tablets. Treatment with diphtheria antitoxin and toxoid, on Oberdoerffer's theory was tried, but the results were disappointing. Of 26 whose sera were tested by the Wassermann and Kahn reactions, 11 were positive to both, 10 were negative to the former and 12 to the latter, while five and three respectively were doubtful.

A graph shows the number of cases and the population for the years 1869-1944. The year of greatest number was 1876 when the total was 61, of whom 15 were in Curacao, 28 in St. Eustatius and 18 in St. Martin. On January 1st, 1944, there were 27 in the leprosarium, 18 males, 9 females. All but five were blacks, four were whites and one a half-caste. Presence of the disease was detected in one under 5 years, in five between 10 and 15, in four between 15 and 20, in three between 20 and 25, in one between 25 and 30, in four between 30 and 35, and in nine above that age. As regards type of case, eight were nodular, four nervous, four were muscular, and eleven were of the mixed types.

Discharge from the leprosarium was permitted if bacteriological examination was negative for three consecutive years. [Abstract from Trop. Dis. Bull. 42 (1945) 392.]

WHARTON, L. H. Annual report for the year 1944. Leprosy Hospital, Mahaica, British Guiana. 16 pp.

Dr. L. H. Wharton was confirmed as medical superintendent from the beginning of 1944 in succession to the late Dr. Rose. This report shows that the subordinate staff consists of 52 males and 21 females. Sanitary measures have reduced the incidence of flies and mosquitoes, improved bread has been supplied and the co-operative spirit and mental outlook of the patients have improved with the provision of employment for 200 of the patients and recreations, cinema, etc., with the help of a special committee. During the second half of the year, 6830 children were examined and 22 early cases of leprosy were detected. It is hoped soon to be able to examine all contacts of patients in their homes. Treatment has followed the usual lines for 300 in-patients, 591 others attending clinics, out of a total of 995 patients, 356 of whom were in hospital. The medical board admitted 35 new cases and discharged 23 on parole. The deaths amounted to 34 (9.5 per cent), 10 of these were from septic complications, 5 from chronic nephritis and 9 from senile and general debility. Most of the patients are Africans, East Indians, mixed and Portuguese, in that order of frequency; the Portuguese numbered 24. The report closes with the statement that there has been definite progress during 1944 in the control of leprosy, both from the treatment and public health aspects. [Abstract from Trop. Dis. Bull. 42 (1945) 737.]

ALEXANDER-JACKSON, ELEANOR. Non-acid-fast forms of the Myco-bacterium of human leprosy. Science. 1945, June 1, 563-4.

The author reports the results of staining material containing *Mycobacterium leprae* with her triple stain (see *Bulletin of Hygiene* **19** (1944) 806 for its composition) which reveals non-acid-fast forms of the tubercle bacillus. A number of unfixed films of nasal material from a case of leprosy so stained, revealed not only red-stained acid-fast bacilli, but also blue-stained non-acid-fast rods in even greater numbers. Nests of rods may show mixtures of both types, but many nests consisted of blue-stained rods only. Fixed unstained smears from leprous skin biopsies from 32 different cases were next treated with the triple stain and examined, with the following results: 27 (84.4 per cent) showed zoogloeal and granules or spore-like forms; 16 (50 per cent) showed zoogloeal forms only; 13 smears (40.6 per cent) showed some acid-fast forms; 11 smears (34.4 per cent) showed acid-fast or non-acid fast rod forms. There were no differences in the findings in patients with different dates of admission, but the oldest, admitted 24 years ago, showed only non-acid-fast zoogloeal forms. In six neural and tuberculoid cases zoogloeal forms and rods were absent. These results strongly suggest that the leprosy bacillus, like the tubercle bacillus, has a zoogloeal form or phase. Further observations with the use of the triple stain are indicated. [Abstract from Trop. Dis. Bull. **42** (1945) 900.]

ALLER ATUCHA, J. F. Sulfatiazol en las manifestaciones leprosas. Mácula—Infiltración — Lepromas — Pénfigo — Ulceras — Conjuntivitis—Saturación sanguinea. (Sulfathiazole in leprotic lesions.) Rev. asoc. med. Argentina **59** (1945) 497-505. 12 figs.

The work which this article records was carried out in 1942 and was reported at the Second Medical Congress in the Argentine. The results which the author mentions are in some cases little short of miraculous, as, for example, cicatrization of a perforating ulcer of the foot in five days, but nothing is said of their permanency, only the immediate results are told. The drug was used as a 15 per cent jelly, or as a 10 per cent oily suspension, or a 15 per cent watery emulsion (crema acuosa). For extensive and generalized lesions a 5 per cent sodium salt was injected intravenously.

Various forms and stages of the disease were thus treated and a short note of a few lines is given on each case. First, the macular, three in number; the places were scraped once a week and then the watery preparation was rubbed in three or four times daily, for 1-3 months. Two improved, the third made no progress. Five cases of leprous infiltration all showed great improvement in 2-4 months by three or four rubbings daily with the same preparation. Two patients with lepromata were treated; the leproma in each case was incised, the contents evacuated and the jelly preparation then applied; cicatrization was complete in 10 days in the one, in 15 in the other. Patients with ulcers of various sizes and depth were treated with the jelly for periods up to 3½ months. In one, with multiple ulcers of the right thigh and knee, "all the ulcers were completely cicatrized" in 11 days. Those with eye lesions the author divides into (1) Hyperacute, in which the sequence of events is rapid, with diffuse keratitis, iritis, exudation into the anterior chamber, hemorrhage and intense pain leading soon to blindness. Two cases of this type are mentioned; the oily

suspension was used and in 16 and 14 days respectively sight was perfect and the treatment was stopped. (2) Acute, in which the symptoms were similar but less severe; one case only of this is reported. In two months, subjective symptoms disappeared and vision improved. (3) Subacute, with small infiltrations and nodules affecting also the lids, with conjunctivitis and iridocyclitis; one case which improved in ten weeks, the patient stating that whenever treatment was suspended the symptoms recurred. (4) Chronic, with plastic changes; 19 cases mentioned, of which 13 improved while 6 remained unaffected.

One patient, a woman of 51 years, had generalized lesions, on face, neck, trunk, and limbs, maculae, and infiltrations. She was given injections of 20 cc. intravenously every six hours for four days, then every eight hours for the same period, then every 12 hours for another four days. She was also given chaulmoogra, 5 cc., and propidon every day; altogether she had 36 Gm. of sulfathiazole (with a blood-content of 4 mm. per cent, so stated, 30 cc. of chaulmoogra and three ampules of propidon. She tolerated the drugs well and 4½ months after the first course she underwent a second, and four months later a third. The maculae presented "a modification in color and shape, very few fresh lesions appeared, and during the whole period, one year, the leprous reactions were fewer and less intense." [Abstract from Trop. Dis. Bull. **42** (1945) 902-3.]

AMENDOLA, F. A traqueotomia na lepra. (Tracheotomy in leprosy.) Rev. brasil de leprol. **13** (1945) 27-30.

The circumstances in which tracheotomy is undertaken in leprous patients differ from those in other, non-leprous, patients, for, in the latter, the operation is a matter of immediate urgency because of acute obstruction, as in laryngeal diphtheria, an impacted foreign body, acute edema, and such-like, whereas generally in leprosy patients the operation is undertaken without haste in cases of gradually increasing obstruction, and the earlier stages have been treated with cautery, for example, or removal of a leproma. Again, the site is often analgesic so there is less need for general anesthesia, but on the other hand, if general anesthesia is needed there is no little risk because of cardiac or pulmonary disease. Hence there is often need for preliminary administration of cardiac tonics. The low operation is to be preferred. A second operation, some time later, may be required, although the tube is in good position; this is due to the formation of a thick muco-membranous exudate below the cannula which is difficult to remove; the operation is then one of urgency and death may occur before relief is obtained.

The author's remarks are based on 26 cases; 11 patients died (but a table gives 10 only), two during the operation, one from syncope, the other owing to the advanced stage of his disease, and the operation could not be completed. Of the others one died a month later, one six months later, three lived for a year; two for 2½ years, and one for 3 years. All these died from cachexia due to the leprosy or from intercurrent maladies. [Taken from abstract in Trop. Dis. Bull. **42** (1945)) 902.]

AMENDOLA, F. A glandula lacrimal na lepra ocular. (The lacrimal gland in ocular leprosy.) Rev. brasil de leprol. **13** (1945) 3-11. 1 plate.

The treatment of eye affections in leprosy is far from satisfactory and in spite of all that is done often fails to prevent total blindness ensuing. On an analogy with other inflammatory conditions, determination of the

focus and its removal are of primary importance. The lacrimal glands, though they may be few, nevertheless by their continuous secretion, if infected, are a constant source of reinfection and consequently of great moment in the evolution of leprotic lesions of the eye.

The author quotes the cases of a patient who had undergone three operations for ocular lepromata in six months, each in turn followed by a relapse. It was decided to extirpate the lacrimal gland and the result was a resolution of the congestion and the ocular lesions.

Appended to the article are brief notes of 20 cases; nearly all the patients had had treatment of all kinds without lasting benefit and had then submitted to removal of the lacrimal gland. In a few days (three-four) the pain and photophobia disappeared and the patients expressed themselves as felling better and the general outlook in every sense of the term rapidly improved. The author speaks emphatically in favor of this operation for the ocular lesions of leprosy, stating that in the majority of cases histological examination shows that the gland is infected and "even in cases in which the pathological anatomy is negative, extirpation is not contra-indicated because clinically benefit nevertheless follows." [Abstract from Trop. Dis. Bull. **42** (1945) 901.]

ARGÜELLES CASALS, D. Lepra e hiperestesia ungueal. (Leprosy and onychalgia.) Rev. Sifilografia, Leprologia y Dermatologia. Marianao, Cuba. 1945, Jan. v. 2, No. 1, 55-6.

Onychalgia, or ungueal hyperesthesia of Oppenheim, is a rare condition, reported apparently first by Oppenheim in 1903 and seen for the first time in Cuba by Argüelles Casals in 1942 (*Rev. Med. Cubana* **53** (1942) 1041). The nails *appear* to be quite normal but are exquisitely tender. (From the description it would seem that the tips of the thumbs and fingers rather than the nail areas are the sites of pain.) Buttoning up the clothes, tying a shoe-lace, playing the piano, typing, wearing gloves, for example, are impossible. Cutting the nails is associated with most acute pain which persists after the operation. Oppenheim considers it to be a "neurosis" (which does not explain much) and says it occurs in members of "neurotic families"; the treatment recommended is galvanism and psychotherapy.

The author records a case in a woman of 66 years who had suffered from the lepromatous form of leprosy for four years and for the last two months with this onychalgia in both hands. Buttoning the clothes, cutting the nails or even slight pressure on them is acutely painful and brings tears to the eyes. Though the toes were not affected when the author saw her she said that she had had the pain there earlier and that it had disappeared in the course of her treatment with chaulmoogra oil.

The author does not consider the question whether leprosy can produce this condition, but states definitely that they are quite distinct since Oppenheim's syndrome is not associated with peripheral neuritis, whereas the pain in leprosy is explicable by the neuritis. (This is, of course, a mere begging the question and does not rule out the possibility of leprosy being one cause of the syndrome.) [Abstract from Trop. Dis. Bull. **42** (1945) 568.]

ARGÜELLO PITT, LUIS. La histopatologia de la lepra. (Histopathology of leprosy.) Rev. med. de Córdoba. **29** (1945) 65-91.

A histopathological description of leprosy is given according to the South American classification. Special attention is paid to the tuberculoid form with particular reference to Castane-Decouds experience with para-arterial neural infiltration. Ten personal observations are included.
—G. BASOMBRIO

ARGÜELLO PITT, L. and CONEJOS, M. Lepra tuberculoide, variedad colicuativa. (Tuberculoid leprosy, colliquative form.) Rev. argent. de dermat. **29** (1945) 190-195.

This is a case report of tuberculoid leprosy with an intensely positive reaction to lepromin. This reaction formed a plaque, circumscribed by a zone of cutaneous necrosis in which histopathological examination revealed frequent and extensive zones of caseosis.—G. BASOMBRIO

ARTOM, MARIO and CERRUTI, HUMBERTO. Consideracões sobre O eritema nodoso na lepra. (Considerations on erythema nodosum in leprosy.) Rev. brasil de leprol. **13** (1945) 239-247.

The author's proposition in this work was the study of the possible existence of pathergic parallergic phenomena in leprosy. Personal concepts about definition and limitation of allergy and pathergy are given as well as about interrelationship between the diverse aspects of exteriorization of those phenomena.

The erythematous nodular elements frequently seen during the evolution of leprosy are particularly considered. The authors think that the name erythema nodosum should be conserved, as this is the classical designation given to clinically and pathologically similar facts occurring during the evolution of other infectious diseases and very probably with the same pathologenetical mechanism.

Based upon personal considerations and upon data of previous literature regarding the erythma nodosum of other infections, the authors conclude that it is admissible that intercurrent diseases, physiological or pathological conditions and therapeutical agents may be the non-specific elements that, added to leprosy evolution, produce in the tissues the pathergic reaction responsible for erythema nodosum. This hypothesis is confirmed both with clinical observations and pathological finds in leprous erythema nodosum. [ENGLISH ABSTRACT.]

BALIÑA, PEDRO L. Seudo lepra maculoanestésica: angioma plano cervicofacial disestesica. (Maculo-anesthetic pseudo-leprosy; disesthesic cervicofacial angioma planum. Rev. argent de dermat. **29** (1945) 133-144.

This is a report of an angioma planum of the cheek extending on to the neck, well circumscribed and accompanied by salient angiomatous lesions of the buccal mucosa. It was interesting because of a definitely limited area of hypo-esthesia to pain from a pin prick within the surface of the angioma. This feature and the fact that the angioma did not appear until the patient was 30 years old (she is now 34) as well as the clinical appearance of the lesion made a differential diagnosis from leprosy necessary. Leprosy has been excluded on the basis of negative bacteriological and histopathological examinations.—G. BASOMBRIO

BECHELLI, L. M., KEIL, H., and ROTBERG, A. Resultados da leprominoreacão em paises não endêmicos de lepra. (Note Preliminar.) (The lepromin reaction in countries where leprosy is not endemic.) Rev. brasil de leprol. **13** (1945) 21-24.

BARGEHR, DE LANGEN and others have regarded positive lepromin reactors, among healthy individuals in countries where leprosy is endemic, as suffering from a subinfection owing to contact with patients.

The authors have tested the reaction among those who have never run the risk of any such contact and have compared the results with the Mantoux tuberculin test among those attending the Skin and Cancer Clinic of the New York Post-graduate Medical School. The results are given in tables, from which the conclusions may be thus summarized: The delayed lepromin reaction does not necessarily imply a latent infection. Its specificity is nevertheless upheld by regarding the positive reaction as allergy to the lepromin, developing in the three to four weeks elapsing between the injection and the recording of the results. WADE had previously observed positive reactions in non-contacts and explained this by saying that such persons "react allergically on coming into contact with Hansen's bacillus."

The early reaction, occurring in 12 hours or less, may also be observed in non-contacts, and the above explanation obviously cannot be applied to these. It has been suggested, by FERNANDEZ and others, that tuberculosis may be accountable for such. The authors' findings in their cases here recorded (36 only, so far) support this interpretation, for in all but one of those giving this early lepromin reaction the Mantoux reaction was also positive. (This short paper is only preliminary; further results will be awaited with interest.) [Abstract from Trop. Dis. Bull. **42** (1945) 901.]

[B.E.L.R.A.] Annual report of the Indian Council for 1944. Leprosy in India. **17** (1945) 88-100, 1 graph.

Much of the work referred to in this report has already been published and dealt with in previous abstracts, but the following additional points are worthy of mention. The work has been maintained in spite of war difficulties. Many army medical men have been trained in the diagnosis and treatment of leprosy and during the year 177 patients have been referred to the Leprosy Department for diagnosis; in 126 of these the presence of leprosy was confirmed. Research work included long-term study of selected cases to correlate clinical, histological, and immunological findings, and intensive leprosy surveys in selected areas of India to study racial, climatic, and other factors influencing the incidence of the disease. It was thus found that a comparatively high lepromatous rate may be accompanied by low gross incidence, and a high child rate, in areas where some sort of isolation is practised, and *vice versa*. This indicates a reduction in new cases where isolation is attempted and where the people are apprehensive regarding the spread of leprosy. Teaching, publishing, and propaganda work have been continued. The financial position of the association continues to be satisfactory. Immunological studies have been extended to trials of the reactions produced by non-lepromatous acid-fast bacilli; but such preparations have not yet proved of value for the lepromin test, which would be simplified if they could be used, because they are easily

cultivated. Sulfapyridine has not proved to be of value in the treatment of rat leprosy. [Abstract from Trop. Dis. Bull. 42 (1945) 1005.]

[B.E.L.R.A.] Annual report of the Indian Council for the year 1945.

An encouraging feature of anti-leprosy work in India during the recent years has been the increasing interest taken by the Central and Provincial Governments. The Health, Survey, and Development Committee of the Government of India has made provisions for the establishment of a Central Leprosy Institute of India in an area to be selected because of the clinical material available, an increase in the existing provisions for institutional treatment, and the development of village isolation colonies. Another advance has been made by the acceptance by the provincial governments of the principle of admitting patients with leprosy for treatment into the general hospitals. The Central Advisory Board of Health resolved that "There is no adequate reason why if needing hospitalization, non-infective cases should not be admitted to the general wards and infective cases to the infective wards."

A study has been made of the course of the disease in cases under observation at Bankura since 1936-37. The study has provided definite evidence against the view once held that the neural and the lepromatous types were simply the early and the late stages of the disease. These two types are two separate clinical as well as immunological entities; the vast majority of the neural cases remain neural, only about 2 per cent change into the lepromatous type. Moreover, in about three-fourths of all neural cases the disease remains mild throughout the course, and may even become arrested in a large proportion of cases. The study has also confirmed the prognostic value of the lepromin test.

Therapeutic studies have shown that stilbamide, a drug found to be of great value in the treatment of kala-azar, has been found to prevent the development of generalized infection in rats infected with rat leprosy material. Preliminary studies have been made with aspergillin and streptomycin, the anti-biotics obtained from the moulds *Aspergillus fumigatus* and *Actinomyces griseus* respectively.—DHARMENDRA

[B.E.L.R.A.] Annual report of the Madras Provincial Council for the years 1944-45.

During the year a further area of Saidapet has been surveyed. Of a population of 1850 adults, 1730 were examined, among whom 43 cases were found. Of 1032 children, 959 were examined with the discovery of 40 cases. The gross incidence (30.86 per 1000 population in this area) was considerably lower than that of 67.0 and 60.4 in the other two areas surveyed. Of all cases, 68.6 per cent were under 10 years of age. The following general facts were also noted:

(a) The sex rate increases in direct proportion to the severity of the disease i.e. serious type leprosy is found more often in males than in females.

(b) The gross incidence is markedly higher in areas where intercommunal relationship is greater, where there is little fear or social isolation of leprosy and where there is a fairly high proportion of lepromatous leprosy.

(c) In five of the areas the child incidence is directly proportional to the gross incidence.

(d) The proportion of lepromatous cases is less in children than in adults.

(e) In all but one area the incidence in males is consistently higher than in females.

The study points out that among children the disease is not generally a progressive disease, in only 16 per cent of child cases had deterioration of their condition occurred and in 50 per cent the disease underwent spontaneous disappearance, resolution, or arrest. A study of progressive development showed that in 7 years, 15 of 238 N_1Ns cases, 3 of 230 N_1Nt minor, and 13 of 40 incipient cases had become lepromatous.

A rural investigation center has been set up under government supervision. A review is given of the gross incidence of leprosy over a 5 year period in villages where preventive measures have been taken. The results show a general reduction of leprosy incidence in 3 of 4 villages where night segregation has been voluntarily enforced. In the village where there was no overall reduction, the measures had been in force only since 1944 and in that village there had been a marked drop in the child rate between 1942-45. There had been a marked increase in incidence in the villages not under night segregation.

The Childrens' Sanatorium at Ettapur has grown in popularity and it is hoped soon to open a girl's section. Work at the Stanley Hospital Clinic and General Hospital has continued. Systematic annual examination of all school children in Madras has begun. This investigation, it is hoped, will aid in the selection of at least three endemic areas where intensive surveys can be undertaken.—H.B.

CAMPOS, N. S. and SOUZA, P. R. Lepra e sifilis. Leprides sifilóides e sifilides leproides. (Leprosy and syphilis.) Rev. brasil de leprol. **13** (1945) 77-94, 17 figs.

This paper deals with an important and puzzling question — resemblance between certain lesions in leprosy and those in syphilis. Lesions may bear so strong a resemblance to each other — syphilis-like leprides and lepra-like syphilides — that a wrong diagnosis is likely to occur and valuable time be lost before the appropriate treatment is undertaken.

The similarities are duly shown by the authors, notably the roseolar exanthem of leprosy to that of syphilitic roseola; tuberculoid leprosy to certain late secondaries in syphilis. Distinctions, on paper at least, are not easily recognized, being matters of degree rather than of kind. Thus, in roseolar exanthemata of leprosy the patches are larger than in syphilis, and in the latter they are more homogeneous and equal in size and evolve more rapidly. As for the tuberculoid lesions, they are less polymorphic in leprosy than in syphilis and their development is slower, taking 6 to 12 months. The Wassermann reaction may help, especially if negative, but it may be positive in some patients; the clinching diagnostic point is the finding of the organism by biopsy.

Excellent photographs illustrate the paper, but it must be confessed (by the abstractor at least) that they afford less enlightenment than one hoped. They bear appropriate legends, otherwise it would be difficult to distinguish, for example, Fig. 1, a tuberculoid leprosy, from Fig. 13, a late secondary syphilide. Cases of papulo-tubercular syphilis simulate, it will be seen, to an extraordinary degree instances of severe facial lepromata. To one photomicrograph depicting the histological changes in a syphilitic

is the legend "granulation of tuberculoid structure indistinguishable histologically from that met with in tuberculoid leprosy." [Abstract from Trop. Dis. Bull. 43 (1946) 47.]

CHALA H., J. IGNACIO. Cloruro de Tiamina Y complejo de vitamina B en el tratamiento de la lepra. (Thiamine hydrochloride and vitamin B in the treatment of leprosy.) Publications of the Institute Federico Lleras Acosta. Reprinted in the Annals of the Society of Biology of Bogota 1 (1945) 253-284.

Therapeutic trials with thiamine hydrochloride and Vitamin B complex were carried out on a group of 27 patients suffering from acute and chronic manifestations of leprous neuritis.

All cases were selected with clinical criterion. Since 1940, these patients were treated by the author at the Federico Lleras Acosta Institute for Leprosy Research and they received the treatment for a period of 22 months.

Thiamine hydrochloride and vitamin B complex were given only by intramuscular route. In some cases intradermal injections were employed. The doses prescribed were from 10 to 60 mg. of thiamine hydrochloride and 2 cc. of vitamin B complex daily in those cases of acute or subacute neuritis. In the chronic manifestations, similar doses were used, but were given only two times weekly.

The treatment was performed by giving series of 12 or 15 injections. The best results were obtained with the large amounts of vitamin B_1 and clinical improvement was observed following prolonged administration. According to our experience in those cases of acute type of leprous neuritis, the vitamin B_1 is a successful treatment if the vitamin is given for a long time. It may be remembered that the results obtained with the use of the anuerin and vitamin B complex are not appreciated immediately.

The 77.77 per cent of cases showed a gradual and remarkable disappearance of the manifestations of polyneuritic disturbances.

The nature of the clinical improvement consisted of a drastic reduction in the severity of the alterations of peripheral sensation and trophic, vasomotor, and secretory disorders. The symptoms remained stationary in 22.22 per cent of patients treated. Aggravated cases were not observed.

CONCLUSIONS

1) The administration of 60 mg. thiamine hydrochloride and vitamin B complex by intramuscular route and for a long time, produces considerable relief in the pain of leprous neuritis and clinical improvement.

2) Vitamin B complex is a really effective therapeutic measure in the treatment of leprosy.

3) The employment of vitamin B complex therapy in some cases of leprosy, may detain the progress or prevent the appearance of acute manifestation of leprous neuritis.

4) Clinical selection of leprosy patients, is an important condition in the success of the vitamin B_1 therapy.

[ENGLISH SUMMARY AND CONCLUSION.]

CHORINE, V. Traitement des lésions oculaires de la lèpre. (Treatment of the ocular lesions of leprosy.) Bull. Acad. Méd. **129** (1945) 230-32.

This note records promising results in the treatment of the difficult eye lesions of leprosy by local injections of sulfonamides. In order to obtain the sulfonamide in solution, 60 Gm. of acetamide and 15 Gm. of sulfanilamide are made up to 100 cc. with distilled water. This solution diffuses slowly through the tissues when injected around a lesion of the skin, and causes its gradual disappearance. In the case of eye lesions, periorbital injections are made of two to four injections of 7-10 cc. of the solution, but, owing to the severe pain they cause, local anesthesia is first induced by the use of 1 to 2 per cent of stovaine. No complications have been noted after weekly injections at different sites. Thirteen eye cases (keratitis, iridocyclitis, etc.) have been treated, but five are too recent to be reported on. Of the other eight cases, in four vision has recovered to normal, and in one after only nine injections it has improved. In the other three, blindness of several months' or years' duration failed to respond to the treatment, but pain in the eyes has been reduced. In eye cases photophobia has been cured and rapid retrogression of keratitis has been observed. Iridocyclitis is less quickly influenced, but is eventually quieted. Moreover, nasal infectionss have been cured in all such cases. In the case of localized dermal nodules the results are also very favorable. (Further trials of this promising method of treatment will be awaited with interest.) [Abstract from Trop. Dis. Bull. **42** (1945) 1013.]

DAVEY, T. F. Leprosy control in Owerri Province of Nigeria. Leprosy Rev. **16** (1945) 21-30.

This report deals with the sixth year's work of this great leprosy colony (see *Trop. Dis. Bull.* **41** (1944) 53 for previous report.) Of the two million inhabitants of the Owerri Province it is estimated that not far short of 75,000 suffer from leprosy, yet two of the six divisions are still untouched in spite of 18,554 patients having been brought within the scope of the work. It is impossible to isolate all the infective cases, but working on a clan basis, with the cordial co-operation of the people themselves, 27 leper villages have been built to accommodate 1,807 of the most highly infective patients, and six more are waiting development. In addition 1,179 patients are living in the central settlement, nearly all infective or requiring hospital treatment. Over forty out-patient clinics supply treatment to earlier cases. Repeated surveys allow newly developing cases to be discovered and treated while still in an amenable stage. Nurses are given eighteen months' training, and 130 are already at work in the clinics and villages. Over 1,100 child patients are being cared for; the majority of these are maintained by B.E.L.R.A.'s child adoption scheme financed by special subscriptions given largely by British children. Physical training boy scout activities and various social amenities are encouraged or supplied. Twenty leprosy inspectors work in different parts of the province; they include in their duties the examination of contacts of known infective leprosy cases, especially children, for early signs of infection. Already, in the case of six clans, the present progress amounts to an approximate isolation with treatment of all infectious cases, together with treatment of all the earlier cases. In these areas progressive diminution in the incidence of leprosy may be expected. Thus the practicability of effecting a rapid

reduction of leprosy in Nigeria with sufficient staff and funds has been demonstrated, and it is this success which has led the Nigerian Government to take over the work with a view greatly to extend its scope. [Abstract from Trop. Dis. Bull. 42 (1945) 1014.]

DELPERDANGE, G. Sur la présence probable du bacille de Stephansky a Coquilhatville. (The probable presence of rat leprosy in Coquilhatville.) Rec. Travaux Sci. Méd. Congo. Belge. 1945, Jan., No. 3, 109-11.

This note reports that acid-fast bacilli were found in 52 of 470 rats examined (9 per cent). One showed lesions of the skin, internal organs and glands, containing very numerous acid-fast bacilli and microscopical changes characteristic of rat leprosy. An inoculated white rat developed similar lesions after several months, but attempts at cultivating the bacilli have been negative. Guinea pigs were negative to inoculation and so was a monkey at the time of reporting. The author concludes that it is probable that rat leprosy occurs in the Belgian Congo, but further work is required to establish this. [Abstract from Trop. Dis. Bull. 42 (1945) 741.]

DHARMENDRA AND RAJAGOPALAN, S. Some aspects of chemotherapy in leprosy. Leprosy in India. 17 (1945) 77-84. (53 refs.)

Owing to the limitations of the hydnocarpus oil treatment of leprosy, the search for a more effective treatment for advanced cases is necessary if early control of the disease is to be obtained. Drugs of the sulfonamide group have not proved to be of much use, but sulfone compounds promise better in mycobacterial disease such as tuberculosis and leprosy. Of these "promin" has already been favorably reported on by American workers, and "diasone" has been found to have some prohibitive effect in tuberculosis in guinea pigs, as has "promizole"; they are therefore worthy of careful trial in leprosy. The high lipoid content of the mycobacteria increases their resisting powers, so any change in the constitution of sulfonamides which makes them lipophilic may be expected to increase their effects. Efforts already made in this direction by other workers are summarized in this article, which should be read by those interested in this line of research. The Leprosy Department of the School of Tropical Medicine, Calcutta, hopes in due course to report on such studies. [Abstract from Trop. Dis. Bull. 42 (1945) 1013.]

DHARMENDRA and SANTRA, I. Epidemiological leprosy surveys in various parts of India. Leprosy in India. 17 (1945) 2-22, 3 graphs.

In this article the surveys carried out by Santra in selected areas of almost all the provinces of India during 1942-44 are considered as a whole. In all of them, except the Kangra Valley in the Punjab, nearly the whole population in the visited villages was examined and the cases found were mapped out; the results among about 5,000 people in each area, were recorded in earlier papers. The following are among the most important points brought out by the inquiries; they are illustrated in the original by the tabulated data. Considerable variations in leprosy incidence were met with in the same province and in the same races in different provinces; these are not easy to account for. The incidence varied between 0.17 in Cachar Hindus and 6.64 in Hill Cahcaris, both in Assam, with an average incidence, among 74,727 persons examined, of 2.33 percent and an inci-

dence of lepromatous cases of 0.1 to 0.96 per cent. The proportion of lepromatous to total cases was 16 per cent, but it varied in different areas between 5 and 62 per cent, and in three areas the percentage was higher than 24 per cent. This gives some measure of the proportion of infective cases which should be isolated. On the whole, but with exceptions, a high total incidence is associated with a high incidence among children and of lepromatous cases. A high total incidence is considered to be the best indication of the spread of the disease and the seriousness of the leprosy problem in any given area. The proportion of infected children varies greatly, but was always lower than in those over 15 years of age. As usual, more males suffered than females, but in the absence of trained lady workers the data are unreliable on account of the purdah system. In some areas cases are ostracized, or a custom prevails of isolating advanced cases in their own homes or in huts outside villages, but no distinction is made between uninfective neural and highly infective lepromatous cases. It is important to note that where such measures are customary a high lepromatous rate tends to be associated with a low gross incidence and a low child rate. This indicates that such measures help to control the number of infections taking place, and also that, with proper instruction regarding the type of cases requiring to be isolated, practical use might be made of the custom where it is in force. [Abstract from Trop. Dis. Bull. **42** (1945) 739.]

DOW, DONALD. Occupational therapy in leprosy institutions. Leprosy Rev. London. **16** (1945) 57-63.

The author, emphasizing that occupational therapy must be considered a therapeutic measure, maintains that two postulates must be remembered in setting up an occupational therapy program: (1) The psychology of the patient, no patient suffering from leprosy is really healthy-minded; (2) The background of the patient. Work must be provided which matches the capabilities of the patient, and acts as a physical and mental stimulus.

The author has organized an occupational therapy program at Victoria Leprosy Hospital, Dichpali, with the following principles considered: (1) Physical well-being of patients. Outdoor and active work is favored. (2) Psychology of patients. Tasks are chosen which the patient can perform or can learn to perform and which the patient feels are a contribution to the communal welfare. (3) Economic considerations. These are secondary to the welfare of the patient but are not overlooked.

All patients at the hospital are required to do a minimum amount of work, which is allocated on the basis of need and training. Infants are cared for in a nursery school, and older ones go to school in the morning. In the afternoon the boys do garden work, and the girls, sewing and mending. Women wash and mend and do the greater part of the cooking. Men do the afternoon cooking, do chores connected with the kitchen, and are employed on the farm and in the gardens. Most of the land on which the buildings and gardens were located was jungle, and the clearing, road-building, etc., has been done by the patients.

The very successful hospital farm, cultivated by the patients, is in charge of a graduate in agriculture. The success of the farm has been due to the following: (1) A system of irrigation which helps through the dry period of each year. (2) Manuring with all waste from the kitchen,

dead leaves, cow dung, etc., being used. (3) Tillage which has been increased every year by clearing more land.

The farm is a considerable financial contribution to the hospital. Of more importance is the feeling of satisfaction and contentment among the patients which comes as the result of doing interesting and productive work. —H.B.

FAGET, G. H. and POGGE, R. C. Penicillin treatment of leprosy: Clinical note. Pub. Health Rep. Wash. **60** (1945) 324.

"Penicillin was tried at the National Leprosarium in the treatment of 7 cases of leprosy in doses of 50,000 to 100,000 units daily which were continued in some cases for a month's time. No specific beneficial effect could be attributed to this treatment either during the course of medication or for 6 months thereafter.

"Subsequently two of the previously treated patients and two new patients were given much larger doses of penicillin without effect." [Abstract from Trop. Dis. Bull. **42** (1945) 646.]

FERNÁNDEZ, J. M. M., BARMAN, J., SERIAL, A., and VACCARO, A. Estudios sobre el tratamiento chaulmoogrico de la lepra. Administraction de les esteres bencilias del aceite de chaulmoogra por sondaje duodenal. (A study of the treatment of leprosy by chaulmoogra oil. Chaulmoogra oil ester-benzyl administration by means of a duodenal tube). La Semana Médica. **26** (1945) 573-580.

Chaulmoogra oil is efficacious when given by mouth, but the gastric irritation it provokes limits its use in therapeutics. As fats are almost exclusively digested and absorbed in the small intestine, a common duodenal catheter was used to introduce simple benzylic esters (neochaulmestrol, chaulmobencil) and iodized esters of chaulmoogra oil directly into the gut. The dose was 0.5 cc. per Kg., repeated after an interval of not less than a month, until more than 500 cc. of oil were given. Occasionally nausea, vomiting, and diarrhea occurred, but no severe symptoms of intolerance were observed in any of the 20 lepromatous patients treated. Therapeutic results will be reported in a subsequent paper. [AUTHORS' SUMMARY.]

FIELDING, J. W. Rat Leprosy: Observations and transmission. Med. J. Australia. **1** (1945) 473-86, 18 figs. (12 on 1 pl.) (Numerous refs.)

This is a detailed, and well illustrated, account of comprehensive investigations, the value of which is enhanced by brief summaries of earlier work on each point dealt with and a full list of references. It brings out some important points and should be read in full by research workers.

After reference to the geographical distribution of rat leprosy, the distribution of the causative organism in the body is dealt with. A number of heavy infections of the sternum are recorded. Infection of glands is variable and most frequent in connection with invasions of the skin. The author confirms the observations by KRAKOWER and GONZALEZ (Science, 1937, Dec. 31, 617) of lepra cells in the pancreas. He has also found graded infection of the stomach, pylorus, and duodenum, which is very much heavier in experimentally infected rats than in those naturally infected. Moreover, the organisms in the feces are so numerous that they can no longer be regarded merely as elimination products, for all infected rats kept for a long period show heavy fecal infections. Microscopical

examinations of the whole of the alimentary tract from the tongue to the anus were therefore made; they revealed heavy infections of the stomach, with destruction of the mucosa at the cardiac end, and a progressively decreasing infection through the pylorus to the duodenum. The rest of the tract was either unaffected or contained only scattered loose organisms. Contrary to the opinion of LOWE [*Trop. Dis. Bull.* 35 (1938) 302], the author found that repeated inunction of intact skin with emulsions of the rat leprosy bacilli resulted in extensive bacillary invasion of the skin associated with clinical lesions with intracellular organism long before extensive internal lesions could occur. As fecal organisms had been found capable of infecting rats through the skin, those portions of the surface of the body in contact with the ground were examined, and in most experiments definite invasion of the skin by the organisms was found. The distribution of the organisms is therefore much more general than has hitherto been realized; for to the list put forward by various authorities the following localities should be added: stomach, pylorus, duodenum, pericardium, bulbo-urethal, and preputial glands (he only examined male rats) and sternum. A link has also been provided between soil contamination and dissemination of the disease, as suggested by WALKER and SWEENEY [Trop. Dis. Bull. 26 (1929) 1032]. Evidence is also recorded to show that the urine commonly contains over a million rat-leprosy bacilli per cc. and the feces far larger numbers.

Microscopical work indicates that the lepra cells in superficial lesions arise from polymorphonuclear leucocytes, the nuclei of which become gradually destroyed with the multiplication of the bacilli in the cells. Of greater interest are the author's observations on the virulence and viability of the organism. The resisting power of the rat leprosy bacillus is shown by the fact that those obtained from the feces of infected animals are equally capable of producing infection through the skin after contact with antiformin for 24 to 48 hours. Moreover, fresh fecal organisms appear to be much more constant in virulence than organisms from urine or those of primary ulcers. His results indicate that the bacilli of granulomata and long-standing ulcers have a low standard of virulence, while the virulence of organisms from primary ulcers, urine, and feces is on a higher plane. For the production of superficial lesions two things are necessary: first, breaking down of local and general resistance by repeated inunction or subcutaneous inoculation of the organisms of various types; and second, the use of organisms of high virulence, the continued inunction of which can produce both internal and external clinical lesions. Doubtless natural infection in wild animals is the result of repeated contact with soil infected by organisms voided in the excreta of rats. Rat lice may also infect by their bites, and emulsions of such lice produce infection when inoculated into rats.

Resistance and immunity are next dealt with. When organisms of low virulence are used to infect by inunction at long intervals, the early lesions thus produced completely disappear in time, probably as the result of the production of immunity in the animals. In experimental rat leprosy vitamin B_2 deficiency had no demonstrable influence on infection. In laboratory animals bacilli usually appeared in the urine about 260 days after primary inoculation. Fecal organisms given by the mouth in water did not infect. Hookworm larvae can take up the bacilli present in fecal cultures, and infections can be produced by the agency of these larvae,

which rapidly penetrate the skin of an animal. [Abstract from Trop. Dis. Bull. 42 (1945) 904.]

HARRELL, G. T. and HORNE, S. F. The reaction to lepromin of patients with sarcoid or tuberculosis compared with that of patients in general hospitals with a discussion of the mechanism of the reaction. Am. J. Trop. Med. 25 (1945) 523-535.

Seventy patients were tested with lepromin, including 5 with sarcoid, 7 with active tuberculosis, and 58 with a variety of chronic diseases including some with healed or inactive tuberculosis. Three of the sarcoid patients gave 1 plus reactions at some time; none gave 2 or 3 plus reactions. Six or 7 with active tuberculosis gave 2 or 3 plus reactions at some time. Of the 58 with various diseases, 23 gave early reactions of 2 to 3 plus, 6 tests were positive late reactions. [Although the number with active tuberculosis who were tested is small, the authors consider the higher proportion of these than of other patients showing positive lepromin reactions to be significant. (J.A.D.)]

Thirty-nine patients were tested simultaneously with lepromin and tuberculin. Statistical analysis suggests a correlation of 2, 3, and 4 plus tuberculin reactions with 2 and 3 plus lepromin reactions at 21 days. However, it is only when 1 plus lepromin reactions, admittedly of little significance, are included as positive that significant results are secured.

AUTHORS' SUMMARY

1. In patients with sarcoid, reactions to lepromin were infrequent and slight; no indication was found that sarcoid is atypical tuberculoid leprosy.
2. Slight (1 plus) lepromin reactions are of doubtful significance.
3. The incidence of intense or moderately intense lepromin reactions in a control group of persons in a non-endemic area of the United States is less than that in endemic areas of the tropics.
4. Strongly positive late lepromin reactions occurred in patients with active pulmonary tuberculosis.
5. The high incidence of intense or moderately intense lepromin reactions in persons with strongly positive tuberculin tests suggests the presence of common sensitizing antigens.
6. A possible mechanism based on soluble protein or polysaccharide antigens is suggested to explain the early lepromin reactions observed in persons with positive tuberculin reactions.
7. The possibility is suggested that the mechanism of the late lepromin reactions in persons with positive tuberculin tests, or with active pulmonary tuberculosis, may be related to insoluble, firmly bound lipid fractions which would be slowly liberated by destruction of *Mycobacterium leprae* in tissues.
8. By comparison with the cellular response to purified lipid fractions of *Mycobacterium tuberculosis*, the mononuclear response to lepromin observed at biopsy further suggests a lipid as the active chemical fraction.
9. If tuberculosis is ruled out by a suitable control substance, lepromin may prove useful in the diagnosis as well as the prognosis of leprosy.

10. No adequate control substance for interpretation of the late lepromin reaction has yet been introduced.
11. Leprosy may be, like tuberculosis, a disease of high contagion, slow progression, and high curability, requiring repeated regular exposures to the infecting organisms.
12. Attempts should be made to recover *Mycobacterium leprae* by inoculation of tissue cultures of monocytes or of chickegg chorio-allantoic membrane with infected material, since pathologic evidence suggests that the living monocyte furnishes a substance essential for growth of the organism. Attempts to reproduce the disease should also be made by frequent inoculations of living organisms into animals over a long period of time. —J. A. DOULL

IBARRA PEREZ, R. and GONZALEZ PRENDES, M. A. Síntomas iniciales de la lepra. (Earliest symptoms of leprosy.) Rev. Sifilografia, Leprologia y Dermatologia. Marianao, Cuba. 2 (1945) 108-11.

Between the time of inoculation by Hansen's organism and the appearance of symptoms there is usually a long silent period. In children separated from their parents the interval ranges up to five years. Though the number of bacilli in a lesion is large, its presence may pass unperceived. Reports of the incubation period between inoculation and appearance of symptoms, as, for example, infection of a wound, a surgical operation, by use of a leprous person's razor, and so on, are not conclusive because the subjects were all living with patients or in contact with them and might have been infected earlier, or at any time.

The authors have noted the initial lesions, that is the first signs observed by patients in 760 cases, and in a list they give the numbers and percentages of the first symptoms. Erythematous maculae were given, as the first seen, by 139 (18.3 per cent), achromic maculae in 104 (13.7), dark macular in 45 (6.0), *i.e.* macular lesions in 288, or 37.9 per cent; areas of anesthesia in 71 (9.34), infiltration of the ears in 66 (8.7), system disturbance with fever in 49 (6.44), rhinitis in 33 (4.33). These are the chief, and the great majority were first observed in uncovered parts, face, neck, arms, chest, and feet. It is noticed that rhinitis comes a good way down the list, and the authors are of the opinion that the nose is not the portal of entry but the portal of exit. After a period of time, the bacillus, having gained entry, finds its way to the lymph or blood capillaries; if the former, the development is slow, if the latter, dissemination is more rapid and widespread, and symptoms such as general malaise, headache, fever, and rheumatic pains are observed. [Abstract from Trop. Dis. Bull. 42 (1945) 1010.]

KIRKALDY-WILLIS, W. H. Sympathectomy in leprosy. East African Med. J. 22 (1945) 88-90.

An African man, aged 40, had had a pricking sensation and burning pain all over his body for 18 months, pain in the wrists and hands for 12 months, numbness of the fingers of the right hand for less than 12 months, and a spreading ulcer on the outer side of his right foot, involving the little toe, for 3 months. He was gradually losing weight.

On admission he was wasted and anemic (Hb. 70 per cent); both hands and the whole left forearm were insensitive, the small muscles of

both hands were wasted and paralyzed, both thighs and legs showed loss of sensation, both knee-jerks and ankle-jerks were increased, and there were light-colored patches on the front of the chest and abdomen. There was a deep necrotic ulcer, 2 x 4 inches in size, on the dorsum of the outer border of the right foot involving the little toe, the two distal phalanges of which were exposed and necrotic.

Operation — Under spinal anesthesia, the right superficial femoral artery was freed from its sheath for 2 inches in the lower part of the femoral triangle after dividing 2 or 3 small branches; the adventitia was injected with normal saline and removed by blunt dissection, and the media was then painted with absolute alcohol, the excess being washed off with saline. The artery contracted to about one-third of its normal diameter and its pulsation was much diminished. The sheath was sutured and the wound closed. The ulcer was then excised, disarticulation at the metatarso-cuboid joint was performed and the ulcer was dressed with iodoform in paraffin.

Four days later the ulcer showed red granulations, but an abscess appeared on the outer border of the left foot and was excised. Ten days later the ulcer was clean and red, the incision in the thigh had healed, and the incision on the left foot was almost healed. After another 8 weeks, the ulcer had quite healed.

The author has no doubt that the operation on the femoral artery produced more rapid healing than would otherwise have occurred; he observed that the right foot remained warmer than the left for about a month after the operation. [Abstract from Trop. Dis. Bull. **42** (1945) 740.]

LENGAUER, L. Palm oil in leprosy. Leprosy Rev. **16** (1945) 67-69.

This article describes a visit to a self-created village for leprosy patients in Southern Nigeria and the treatment for leprosy in this village.

In this village there were about 100 leprosy patients with the lepromatous and neural forms. Some had leprotic ulcers, but these were healing. Their skin was smooth, almost velvety, and leprotic tubercules and macules looked flattened almost as if dissolved. The only treatment employed was palm oil used for rubbing and taken in larger doses than the natives usually employ.

The author has prepared an ointment from palm oil, mixed with zinc oxide powder, for the treatment of chronic ulcers and finds it an extremely satisfactory treatment. She found that a cup of palm oil a day cures the constipation of bad forms of leprosy and establishes normal function, and concludes that the village has discovered a new therapy which is cheap and reasonable. —H.B.

Leprosy Research Department, School of Tropical Medicine, Calcutta, for 1943. Leprosy in India. **17** (1945) 32-38.

This report in addition to study of epidemiological factors deals with further work by Dharmendra on the isolation of the antigens from Hansen's bacillus. This includes the separation of the active protein by extraction with chloroform which was done without the use of heat, in the hope of obtaining a more specific substance; but without success, for it still gave reactions in non-contacts in the little-affected Punjab plains, possibly owing to traces of chloroform not completely removed. The former meth-

ods of extraction have been applied in the case of the bacilli of KEDROWSKY and of STEFANSKY's rat leprosy organism. Four fractions, similar to those of Hansen's bacillus previously reported on, have been tested on leprosy patients. In the case of all three bacilli the polysaccharide fraction is inactive, while the acid-soluble fraction is active and antigenically similar in giving positive reactions in neural and negative reactions in lepromatous cases. On the other hand, while the nucleoprotein and alcohol-soluble protein of Hansen's bacillus act in the same way as the acid-soluble fraction, those of Kedrowsky's bacillus and of the rat leprosy bacillus give positive reactions in both types of leprosy, and therefore have no prognostic significance. It thus appears possible to isolate a fraction, the acid-soluble one, from some acid-fast bacilli other than that of Hansen, with a similar action in contacts and non-contacts as that of Hansen's bacillus itself. The fact that Kedrowsky's bacillus is easily grown will thus greatly simplify the production of an antigen of value in leprosy prognosis.

The therapeutic value of sulfanilamide derivatives has also been studied. The injection into bacteriologically positive leprosy lesions of two grains of the drug in 2 cc. of arachis oil had no effect on the bacilli. Owing to the difficulty of obtaining trichloracetic acid for local applications, a 1 in 5 dilution of carbolic acid, well shaken, has been used as a substitute. Similarly 1 per cent thymol has been substituted for 4 per cent creosote for addition to hydnocarpus oil used for injections. It has previously been reported that sulfapyridine and sulfanilamide have a bacteriological effect on rat leprosy bacilli *in vitro;* it has now been found that these drugs are ineffective *in vivo.* [Taken from abstract in Trop. Dis. Bull. **42** (1945) 739.]

LIMA, L. de S. and CERQUEIRA, G. de C. Terapeutica experimental da lepra pela solutiazamida. (Treatment of leprosy with "Solutiazamide.") Rev. brasil de leprol. **13** (1945) 97-100.

"Solutiazamide" is stated to be p. (y-phenyl propyl amino) phenyl sulfamidothiazole-x-y-disulfonate of sodium and prepared directly from sulfathiazole and is very readily soluble in water. A solution of 45.3 per cent corresponds to a 20 per cent sulfathiazole base. It was administered daily (except Sundays), intravenously in doses starting with 1 cc. and increasing up to 5 cc., or, for adults, 10 cc. After three weeks an interval of one week is allowed to elapse before the treatment is continued. The treatment is controlled by a blood count and hemoglobin estimation every 10 days, examination of the urine and any deposit, and an estimation of the drug in the blood. If the red cells fall below 3½ million per cmm., the dose of the drug is reduced and liver preparations are given; the urine is examined for blood and albumin or any indication of nephrosis, and if it appears, treatment is suspended.

The new drug was tried in 50 cases of moderately advanced lepromatous forms, and others more advanced, 50 cases of lepromata with skin involvement and lesions of eyes and nose and some in whom chaulmoogra had been tried ineffectually. The authors published their results in order that others may be led to make trial of the drug. These results sound almost too good to be true. The authors report: rapid cicatrization of leprous ulcers, cicatrization of fusing lepromata, disappearance of lepromatous infiltrations to the level of the skin, softening and disappearance of

cutaneous nodules; perforating ulcers are sometimes benefited; the ocular lesions improve and do not relapse, nasal crusts disappear, obstruction is relieved and dyspnea subsides. [Taken from abstract from Trop. Dis. Bull. 43 (1946) 48.]

MARIANO, J. Pênfigo bolho-esfoliativo e lepra. (Exfoliative pemphigus and leprosy.) Rev. brasil de leprol. **13** (1945) 103-6, 2 figs.

A female leprosy patient of 42 years, clinical type N_1, developed a bullous rash on the thorax which was at one time thought to be pemphigus foliaceus, but the bullae were associated with ulcerating and scabbing areas. "The type and localization of the lesions by themselves rule out the possibility of Duhring's disease," says the author (but dermatitis herpetiformis commonly occurs on the trunk.) [Abstract from Trop. Dis. Bull. **43** (1946) 46.]

MOISER, B. Modes of transmission of Hansen's disease (leprosy). Leprosy Rev. **16** (1945) 63-67.

Since 60.9 per cent of the patients admitted to Ngomahuru Hospital in Southern Rhodesia gave no history of contact with a leprosy patient, the author, only doctor at the hospital, felt that there might be an intermediate host for *Mycobacterium leprae*. The cockroach was singled out for study because of its cosmospolitan distribution and the fact that other possible vectors had been studied.

Of the many hundreds of cockroaches examined, 69 per cent showed small acid-fast "oval bodies" ranging from the size of a red blood corpuscle to that of a small bacillus such as Hansen's. Occasionally a ruptured one is found with the contents either granular or bacillary and indistinguishable from *M. leprae*. Some have acid-fast bacilli attached to the surface having the appearance of Hansen's bacillus.

Cockroaches fed on meals containing material from ulcerating nodules have been found to contain Hansen's bacilli in large number in the gut and dried feces. The dried feces left in water show no oval bodies, but many *M. leprae*. The bacilli have been found to remain unchanged in the dried feces for 169 days. In the white scars of cockroach bites, Hansen's bacilli have been found. The bacilli do not appear to last long within the roach, but remain unchanged in dried droppings for a longer time.

The author believes that his investigations give reason to doubt an exclusive contagion and infection theory of the transmission of leprosy and give hope that further investigation of cockroaches may produce evidence that the disease is occasionally transmitted by the cockroach bite and possibly by its dried feces coming into contact with the skin or being ingested with food. —H.B.

MOM, A. M. and BASOMBRIO, G. E studios de reactibilidad cutanea en lepra, VII. Las intradermorreacciones provocadas por la lepromina y el 2-4 dinitroclorobenceno. (Skin reactions in leprosy. VII Intradermo-reactions due to lepromin and 2-4 dinitrochlorobenzene.) Rev. Argent. dermatosif. **29** (1945) 120-28. With 10 figs., 26 refs. and English summary.

The authors have previously reported their results with these antigens [see *Trop. Dis. Bulletin* **41** (1944) 1049] and now put on record further tests, using the same technique as before. The reaction is read at 48 hours

(the early reaction), when, if it is positive, the redness and edema are not less than 10 mm. in diameter; and at the third week (the later or delayed reaction) when there is a nodule not less than 5 mm. in diameter, with or without softening or central ulceration. The nodular, or late, reaction begins to show itself at the end of the first week and progresses for a fortnight. It may last for 6 weeks or more and may, but does not always, leave a scar. Those are classed as doubtful in which the early reaction is between 5 and 10 mm., and the late 3-5 mm. in diameter.

Tests were performed on 223 persons: 71 patients with lepromata, 90 with tuberculoid leprosy, 21 "non-characteristic" (182 patients in all), 15 apparently healthy persons living with lepromatous cases, and 26 healthy subjects having, as far as was known, no contact with leprosy patients.

In the 71 lepromatous patients the reactions were mostly negative with both antigens, early and late. The tests agreed in 69 in the early reactions and disagreed in two; with the late reaction both were the same in all 71.

In the 90 tuberculoid cases the reactions were positive in the majority and were concordant. With the early reaction there was agreement in 75, non-agreement in 15; with the late reaction the respective figures were 81 and 9.

In the 21 non-characteristic, simple inflammatory form, 19 gave the same reactions with both antigens at the early reading, two were discordant, whereas at the late reading 17 were in harmony, four were not.

Of the 15 apparently healthy subjects living with leprosy patients in the early reaction 12 were in harmony, three were discordant; in the late all 15 gave the same reactions to both antigens. Lastly, of the 26 healthy subjects, the early reaction was concordant in all but one (dinitrochlorobenzene negative, lepromin positive); the late reaction was concordant in 24, discordant in two (both lepromin positive, dinitrochlorobenzene negative).

The histological changes set up by the intradermo-reaction to both these antigens were studied by staining biopsy specimens at the end of 24 and 48 hours, and at the 4th, 8th, 16th, and 30th days; these are shown by a series of well-produced photomicrographs. [Abstract from Trop. Dis. Bull. 42 (1945) 1012.]

MUIR, E. Future program of B.E.L.R.A. A progressive plan for the control of leprosy in the British Colonies. Leprosy Rev. 16 (1945) 14-21.

During the first twenty-one years since the foundation of the British Empire Leprosy Relief Association (a short history of whose work has recently been published in pamphlet form by B.E.L.R.A.) the Association has been mainly engaged in the pioneer work of demonstrating the value of the improved treatment of leprosy through the injection of soluble preparations of chaulmoogra oils, and in epidemiological studies to determine the simplest methods of finding and treating the early stages of the disease, which are alone amenable in large numbers to that treatment. The history above referred to demonstrates the success of these modern methods of control in Nigeria, British Guiana, Ceylon, India, etc., and opens the way to their more general adoption by the Governments of the many leprosy-infected areas of the British Empire. A new situation has arisen since the Colonial Development and Welfare Scheme recognized the value of the anti-leprosy work already accomplished, and provided grants to-

wards extending the work. The most noteworthy of these is the sanction of an expenditure during the next five years of £258,000 to cover the capital and recurrent costs of a new leprosy department of the Nigerian Government, to take over the doctors, nurses, and lay workers of the very successful leprosy agricultural colonies, which have been largely organized and financed hitherto by B.E.L.R.A. and various missionary bodies. This will free £3,500 a year and thus enable the Association to extend its work in other Colonies, especially those of severely infected African tropical countries, and also to extend research work with a view to carrying out prolonged and carefully controlled tests of sulfonamide and other promising drugs with a view to establishing a more effective treatment of the difficult infective lepromatous types of leprosy, which, if successful, will hasten very greatly the reduction, and eventual eradication, of the disease from a great part of our empire.

After pointing out the great opportunities thus opened out of still more effective work for B.E.L.R.A. as soon as doctors and others become available for employment under the Association, to finance whom a special appeal is being made this year. Dr. Muir gives in this paper a brief survey of the most urgent requirements of the following British Colonies and Territories. Nigeria presents the most serious Empire problem outside India, on which B.E.L.R.A. has especially concentrated its efforts in recent years. A number of additional medical and lay staff will be required to extend the work; they can best be recruited and trained by B.E.L.R.A. The Equatorial province of the Anglo-Egyptian Sudan presents another large problem, where work by the Government and by the C.M.S. is already in progress, but requires material extension. In East Africa much pioneer work has been done by medical missionaries with B.E.L.R.A. help, but only the surface of the problem has been touched; plans for greatly extending the work only await the necessary staff and funds. In West Africa very little has yet been done in the Gold Coast, Sierra Leone, and the Gambia. In the West Indies the Colonial Development Fund is now giving assistance, but more workers are required, and the same remark applies to several smaller infected areas. There is thus ample scope for further work by B.E.L.R.A. [Abstract from Trop. Dis. Bull. **42** (1945) 1005.]

SCHUJMAN, SALOMON. Estudo comparativo entre a reacão de Mantoux e a de Mitsuda nas diversas formas clinicas da lepra (1) (Comparison between the Mantoux and Mitsuda reaction in different forms of leprosy.) Rev. brasil de leprol. **13** (1945) 231-236.

The author has studied comparatively the Mantoux reaction with the Mitsuda reaction in 210 cases of leprosy: 122 lepromatous type (Mitsuda negative) and 88 neural tuberculoid (Mitsuda positive) all of them being adult persons living in the city. After several considerations he arrives at the following conclusions:

(a) The percentage of anergy to tbe tuberculin (Mantoux negative to 1/10) is higher in the lepromatous type (19 per cent) than the tuberculoid type (3½ per cent).

(b) That the disagreement between the Mantoux reaction and the Mitsuda reaction is observed only in lepromatous cases (Mantoux positive and Mitsuda negative) while in patients of tuberculoid leprosy, agreement has been observed in more than 96 per cent in both reactions positives.

(c) That the disagreement between the Mantoux and Mitsuda reactions in the lepromatous type, is explained by the specific anergy that this type of patient has to the *Mycobacterium leprae*.

[FROM THE ENGLISH SUMMARY.]

SEN, J. B. Purulia Naba-Kustha-Nibas (Balarampore). A new line of attack on the leprosy problem. Leprosy in India. **17** (1945) 43-7.

This is an interesting account of a trial of a new and promising method of dealing with the serious problem of the wandering begging leprosy patients, who help to spread the disease in India, though to a limited extent because many of them are of an advanced, crippled, little infective nerve type. The term Naba-Kustha-Nibas means the New Leper Home. The need for its foundation was demonstrated by the popularity of the large leprosy institution at Purulia, which attracted hundreds of begging patients from other parts of India, who could not be admitted to the older institution. It was originally intended as a night shelter, but owing to the generosity of the people of Purulia, with the aid of grants from local government bodies, it has been developed into a home in which the unfortunate patients are lodged and fed four miles out of the town. It was found that many of them were fairly well-to-do persons, who had been driven out by their relatives, and some of them have recovered part of their property and given it for the support of the new home, which now contains some 300 patients.

Many of them do agricultural work to help in the feeding of the patients, and others are employed on weaving or making pottery, etc. Thus new hope and interest in life is provided, and the patients are regarded as guests of the town. This plan is worthy of imitation by the numerous cities of India in which the begging leprosy patient is a nuisance, discreditable to those who neglect the care of their afflicted relatives. (Much money has for long been expended in India in providing homes for keeping alive maimed and diseased cattle, which Hindus are prohibited from putting out of their misery, because cows are sacred in their eyes. The above is, however, the first attempt the reviewer can recall of the people of India raising funds for providing homes for their own leprosy outcasts; hence its importance.) [Abstract from Trop. Dis. Bull. **42** (1945) 1014.]

SHAMA RAO, A. Leprosy surveys in Hyderabad, Deccan. Leprosy in India. **17** (1945) 64-8, 1 map.

This is the third and concluding report of a leprosy survey of the Hyderabad State in the Deccan, and the results of the whole work are illustrated by a map showing the incidence of the disease in each of the 15 districts. From this and the tables of data it appears that the east central districts have the highest rates (0.5 to 1.0 per cent) and western districts the lowest (0.1 to 0.3 per cent). The north and south-eastern districts show the intermediate rates of 0.31 to 0.49 per cent. No explanation is given of these differences. The rates found by complete surveys of the population of the villages within a five mile radius of leprosy clinics at hospital or dispensaries, were from 10 to 40 times higher than the figures of the censuses made in these areas in 1931. This is due to the number of early cases found by the survey parties. Males numbered three times as

many as the females found by the surveys, but owing to the purdah system and the want of a female doctor in the survey party, this ratio is not a true picture of the actual conditions. The percentage of lepromatous cases showed the high figures of 31 to 43 per cent of the total cases. The proportion of children below the age of fifteen was above 10 per cent in only one of the three districts now reported on. [Abstract from Trop. Dis. Bull. 42 (1945) 1005.]

TELLO, E. A. Asociaciónes morbidas, Mal de Hansen y. fiebre de Malta. (Morbid associations, Hansen's disease and brucellosis.) Rev. argent de dermat. 29 (1945) 228-230.

This is a report of the association of brucellosis and leprosy of lepromatous form in a woman 44 years of age, in whose family there were other members suffering from the same infection. —G. BASOMBRIO

TROUT, C. L. The cultivation of the lepra bacillus. J. Trop. Med. and Hyg. 48 (1945) 8-9.

The author has succeeded in obtaining a pure culture of an acid-fast organism by inoculating a Difco agar medium (containing glycerin) with an emulsion obtained by injecting saline into a leproma and withdrawing it into the syringe. The emulsion contained many acid-fast organisms. During incubation (presumably at 37° C.) carbon dioxide was passed over the medium. The emulsion was kept in the syringe, in the incubator, for six weeks before inoculation of the medium; by that time filaments had appeared in it.

The author has also grown acid-fast organisms, isolated in previous experiments, in a Difco broth medium through which ammonia gas, or carbon dioxide, was bubbled. [Abstract from Trop. Dis. Bull. 42 (1945) 900.]

WHARTON, L. H. Annual report for the year 1945. Leprosy Hospital, Mahaica, British Guiana. L. H. Wharton, Medical Superintendent.

The staff has been maintained with some changes. Buildings, grounds, roads, and bridges have been repaired and improved.

Outdoor games, entertainment brought from the outside, dances, concerts, etc., have contributed to the improved mental outlook of the patients. Two hundred patients are employed and receive an average of $6.00 per month for their work. An allowance of $5.00 has been introduced for children of in-patients, and separate homes for infectious and non-infectious children have been successfully operated by the hospital.

A school survey in the counties of Demerara and Berbice was made during the year. Of the 37,886 children examined, 82 cases of leprosy were found, a rate of 2.1 per 1,000.

Treatment was given to in-patients and at various clinics to out-patients. Intradermal and intramuscular injections of hydnocarpus oil and its esters, together with external applications of trichloracetic acid and carbon dioxide snow were used. Penicillin was tried during the year, but was found effective only for the complications of leprosy. Promin has been used for six months and has been found to have a most beneficial effect on lepromatous cases.

The hospital had at the end of 1945, 1,024 cases of leprosy, of which 348 were in-patients and 675, out-patients, giving a prevalence rate of 2.6

per 1,000 for the colony. A total of 84 admissions were made during the year, of which 30 were new cases, 10 relapses, 21 for intercurrent diseases, and 23 for economic reasons. Thirteen were discharged on parole, and there was a death rate of 4.8 per cent for the hospital. —H.B.

ZANETTI, V. Lepre et prophylaxie au Congo Belge. (Leprosy and its control in the Belgian Congo.) Rec. Travaux Sci. Med. Congo Belge. 1945, Jan., No. 3, 96-108.

This paper gives a long general account of a system of agricultural village isolation of leprosy patients (V.A.I.L. for short) in the Belgian Congo. Total compulsory segregation is not advised for the estimated 60,000 cases, but numerous agricultural villages are being organized, each to provide for 300-400 cases, visited once or twice a week by a medical officer and with work for the able-bodied to reduce the cost and to provide food. A plantation of hydnocarpus trees in each will furnish the oil for treatment. Indirect and mild pressure is used to obtain admission of infective cases. Only uninfective patients are allowed to visit their homes, but visitors can come to the boundaries to see their relatives. The isolation is more or less voluntary in most cases and the cost is moderate. All possible social amenities are provided. A home is provided for the healthy children of patients. The original diagnosis, and examinations before discharge when the disease is arrested, are always made by doctors with bacteriological tests. In treatment a mixture of hydnocarpus oil and sodium gynocardate is much used. [Abstract from Trop. Dis. Bull. 42 (1945) 741.]