CURRENT LITERATURE

One of the most important objectives of the JOURNAL *is to take due notice of the current literature of leprosy, especially for the benefit of readers to whom medical libraries are not readily accessible. The Contributing Editors (see inside front cover) are depended on primarily to provide this material; but when necessary, abstracts are drawn from other sources, though this involves unavoidable delay.*

GUILHERM, J., BANOT, M. and NGUYEN-VAN-LIEN. L'utilisation du "krabao" indochinois pour le traitement de la lèpre. [Use of "krabao" in the treatment of leprosy.] Arch. Inst. Pasteur Indochine No. 18 (1933) 171-185.

This is a study of the seeds of *Hydnocarpus anthelmintica*, their oil content (17.9 per cent), the quantity that can be extracted in the cold (10-12 per cent), and the preparation of a neutral oil by means of sodium carbonate. The fruits mature from June to September; they are of great pharmacological and economic value for Indochina. —ET. BURNET

SOUCHARD, L. 18 mois de fonctionnement d'un dispensaire anti-lépreux à l'Institut Pasteur à Saigon. Traitement par le savon total de krabao. Considérations sur la prophylaxie de la lèpre. [Functioning of the leprosy dispensary, Saigon; treatment by krabao soaps; considerations of prophylaxis.] Arch. Inst. Pasteur Indochine No. 18 (1933) 257-277.

This is a report of an experience which demonstrates the usefulness of dispensaries in the prophylaxis of leprosy. The Culao-Rong leprosarium has a capacity of only 200 cases, and there are 5,000 in Indochina. —ET. BURNET

SOUCHARD, L. and RAMIJEAN. Contribution à l'étude du traitement de la lèpre par les savons de "krabao." [Treatment by soaps of krabao.] Arch. Inst. Pasteur Indochine No. 18 (1933) 187-256.

In this study, continuing the work of Boez, Guilherm and Marneffe, 48 cases are reported in sufficient detail to permit individual examination. Unfortunately, the cases are all old. In general they received, by mouth, each day, 10 to 16 comprimes of 0.3 gm. of the krabao soap during periods of 5, 3 and 2 months, separated by rest periods of about 2 months. This treatment caused digestive disturbances and signs of hepatic insufficiency, which sometimes necessitated suspending the treatment. No case was declared "cured" or even "blanchi"; 14 were improved, 6 doubtfully improved, 11 stationary, and 11 were worse. The improvement seemed to occur especially in nodular leprosy; there was also a favorable effect upon neuritic pain and the muscular function. Macules dis-

appeared very slowly and irregularly. The improvements observed were maintained during the year which followed the treatment. The authors are now trying gluten comprimes. —ET. BURNET

FERON, J. Lèpre et neuro-fibromateuse. [Leprosy and fibromatosis.] Bull. Soc. Path. exot. **27** (1934) 912.

The nodules of von Recklinghausen's disease may be mistaken for those of leprosy. —ET. BURNET

GILLIER, R. Une méthode sérique simple différenciant la lèpre et la syphilis. [A simple serological method of differentiating leprosy and syphilis.] Bull. Soc. Path. exot. **27** (1934) 915.

While the formol coagulation test gives nearly the same results in the two diseases, the Meinicke reaction, which is positive in syphilis, is negative in leprosy. The two reactions can be made comparatively in a simple manner. Four tubes are used: (1) pure serum, 1 cc. (control); (2) 1 cc. serum plus 2 drops of pure formol; (3) 0.2 cc. of serum plus 1 cc. of a 1 to 11 dilution of tolu-antigen at 50-40°, 1 to 300 in saline (Meinecke); (4) 0.2 cc. of serum plus the same dilution of tolu-antigen, to which is added a drop of pure formol before mixing with the serum (control). —ET. BURNET

GOURVIL, E. La lèpre au Soudan. [Leprosy in the Sudan.] Bull. Soc. Path. exot. **28** (1935) 7.

The incidence of leprosy in this region is about 30 per thousand. Among 19,263 young men examined in the course of recruitment, 401 (20.8 per thousand) were found to have leprosy. Using chaulmoogra oil in association with preparations of arsenic and of cod liver oil, a certain number of cases were freed of the bacilli in periods varying from 3 weeks to 3 months. —ET. BURNET

NICOLAS, C. Bleu de méthylène et lèpre. [Methylene blue in leprosy.] Bull. Soc. Path. exot. **28** (1935) 10.

Of 9 native patients treated 1 was much improved, 2 improved, and 3 without result, these last being cases in which hyrganol was without effect. Being painless the treatment is easily borne, and according to Nicolas it is more efficacious than hyrganol. —ET. BURNET

STÉVENEL, L. L'épuration des huiles de chaulmoogra n'est-elle pas une erreur thérapeutique? Réflexions au sujet des injections intraveineuses d'huile. [Is not purification of chaulmoogra oils a therapeutic error?] Bull. Soc. Path. exot. **28** (1935) 14.

The author is more than ever convinced of the truth of the idea that he has held since 1929, that the more chaulmoogra oil is purified, especially with heating, the more its activity is diminished. He recalls the example of ipecac without emetin, which for a time was employed in amebic dysentery to avoid vomiting. According to him the effectiveness of chaulmoogra oil is due to substances found in it as soluble "impurities," such as a sterol, toxic for cold-blooded animals, which he has isolated from the seeds, and he recommends the use of oil expressed from the whole seed. Contrary to Labernadie, he believes that intravenous injections of the oil are very dangerous. —ET. BURNET

LABERNADIE, V. A propos des injections intraveineuses d'huile. [Intravenous injections of oil.] Bull. Soc. Path. exot. 28 (1935) 97.

Replying to the objections of Stevenel, the author discusses the recent progress in the practice of intravenous injections of oil. He himself has given more than 4,000 such injections without accident. Over 2,000 of these were of *H. wightiana*, either neutralized, or weakly acid (less than 3 per cent), or in 10 per cent emulsion. The leprous nodules and the congestive lepromas, isolated or *en nappe*, benefit most rapidly from this treatment, sometimes in 6 or 8 injections; the effect on the macules is slower. Neutralization, which leaves 30 to 50 per cent of soap on the filter, does not deprive the oil of its active principles, as shown by comparative experiments on two equivalent groups of patients.—ET. BURNET

BERNY, P. Bacillurie chez les rats lépreux. [Bacilluria in leprous rats.] Bull. Soc. Path. exot. 27 (1934) 910.

There is no spontaneous bacilluria in leprous rats, and potassium iodide does not induce it. However, in highly infected rats novarsenobenzol, from the first injection, causes a bacilluria which commences from the first hour and continues for 5 or 6 hours. —ET. BURNET

PRUDHOMME, R. Action des rayons X sur les lépromes des rats. [Action of X-ray on lepromas in rats.] Bull. Soc. Path. exot. 27 (1934) 917.

Local irradiation of the site of a new inoculation does not prevent infection taking place. Irradiation of an already formed leproma causes softening, beginning at the surface and extending into the depth of the lesion, with accumulation of pus loaded with bacilli. After ten days of irradiation the bacilli in this pus were still virulent. —ET. BURNET

BALIÑA, P. L. [On contagion in leprosy.] Rev. Argentina Dermat. 18 (1934) 141.

This communication is a comment on Fernandez' note on Manalang's theories of contagion in leprosy, the author giving his views on the "revolutionary theories which attack the classical conception of leprosy contagion at its foundations." He finds the situation in Argentina advantageous for the observation of these matters, first because the leprosy rate is very low and it is possible to follow the origin of every case of contagion; second because the inhabitants are of the white race and it is easier to make an early diagnosis in them than in colored races; third because the leprologists here are also dermatologists; and fourth because this is a country of immigration from European countries in some of which leprosy does not exist. When a German or an Englishman without leprous antecedents comes to this country and becomes a leper thirty or forty years after living here in a region where leprosy is frequent, it is very unlikely that the infection dated from his infancy. Such cases are quite frequent here. Baliña also relates his own findings in 60 leprous married couples, in 8 of which both were lepers. In these 8 cases the contaminating partner was "bacilliferous." He finishes with a reference to a case recently reported by Marchoux [the JOURNAL 2 (1934) 1] which has the value of an experiment; a French physician was infected while making a biopsy of a nodular case of leprosy. —G. BASOMBRÍO

CARILLO, F. [Coloid chaulmoogra oil in treatment.] Sem. Méd.—Noviembre 8, 1934.

The author reports the results obtained in 13 leprosy patients treated with a preparation which, he claims, has been used for the first time. He confirms the favorable results claimed in his first communication (1932), but says that after two years the patients undergo a sudden evolution, and he believes that this may be due to the influence of the medicament. For this reason he has stopped his experiments. —G. BASOMBRÍO

FIDANZA, E. P., FERNANDEZ, J. M. M. and SCHUJMAN, S. Evolución posterior de 100 casos de lepra tratados durante los años (1929-32) por los derivados del aceite de chaumoogra. [Progress of a hundred cases treated for three years with chaulmoogra derivatives.] Rev. Argentina Dermatosif. 28 (1934) No. 1.[1]

The experience of the authors with 100 lepers treated with derivatives of chaulmoogra oil in three years leads them to the following conclusions: (1) In advanced cases the results are less favorable because a large percentage relapse; on the other hand, in light or incipient forms they dismissed 20 per cent as cured; 40 per cent remained negative, and none of the patients treated relapsed. (2) Discouraging results in the advanced forms should convince the authorities of the country that they must arrange for the isolation of the contagious forms, and also for the treatment of the lighter cases, which are more numerous and become negative under treatment. —G. BASOMBRÍO

FERNANDEZ, J. M. M. and SCHUJMAN, S. Ventajas e inconvenientes del método de infiltración intradérmica en el tratamiento de la lepra. [Advantages and disadvantages of cutaneous infiltration in treatment.] Rev. Argentina Dermatosif. 28 (1934) No. 1.[1]

The origin and the technique of the original method of intradermal infiltration are discussed, and the results obtained with it by the investigators. They recount the experiments made in the leprosy service of the Carrasco Hospital with different preparations, making a comparative study in which they show the drawbacks of each. They reach the conclusion that the method of dermal infiltration is of real efficacy, but that the medicament to be employed should be very carefully chosen. —G. BASOMBRÍO

FERNANDEZ, J .M. M. and SCHUJMAN, S. El empleo de la fluoresceina en el tratamiento de la lepra. [Fluorescein in treatment.] Rev. Argentina Dermatosif. 28 (1934) No. 1.[1]

Thirty-two cases of several clinical forms were treated with a bicarbonated 2 per cent solution of fluorescein by intradermal or intravenous injections. The treatment was administered for about 15 weeks in every case, each patient receiving an average of 200 cc. in all. The medicament was well tolerated in all cases; but with the exception of some cases that showed improvement of the

[1] This reference is to a published abstract of the paper, which was read at the 4th Congreso Nacional de Medicina in Rosario, September, 1924. So far as can be told from the literature available it has not been published in full.—EDITOR.

general health the medication had no effect, or sometimes even a bad effect, stimulating the disease. There was no clinical, bacteriological or histopathological modification of the lesions. —G. BASOMBRÍO

FERNANDEZ, J. M. M. El "leprolin test." [The leprolin test.] Rev. Argentina reacciones leprosas. [Anilines in the treatment of lepra reaction.] Rev. Argentina Dermatosif. 28 (1934) No. 1.[1]

After employing the commonly used treatments with variable results, the authors tried different aniline dyes. Mercurocrome gave satisfactory results, especially when pyogenic complications existed. Flourescein was not very satisfactory, except in cases with acute ocular reactions. Finally, eosin gave no results. —G. BASOMBRÍO

FERNANDEZ, J. M. M. El "leprolin test." [The leprolin test.] Rev. Argentina Dermatosif. 28 (1934) No. 1.[1]

The author reviews the experimental investigations with leprolin, and then reports results of his own experiments. He prepares two tests, one following the classical technique of Muir and Hayashi, and one devised by himself ("leprolin N"). Using both tests and normal horse-serum on leprosy patients, healthy people living in contact with lepers (adults and children), and healthy persons without leprous antecedents, he arrived at the conclusion that the leprolin test is an element of real prognostic value. —G. BASOMBRÍO

WAYSON, N. E. and RHEA, T. R. Leprosy. Observations on its epidemiology in Hawaii. Pub. Health. Bull. No. 212, Washington, 1934. *Abst.*: Publ. Health Rep. 50 (1935) 442-444.

Statistics on leprosy have been kept in Hawaii for the past 40 years, and a study of these and of certain local conditions reveal some of the epidemiological features. The subjects discussed are: trend of incidence, probable age of infection, the sex ratio, degree of communicability, susceptibility of races, relation of contact to the development of the disease, and correlation of economic and the environmental conditions with prevalence of the disease.

The admission rates have declined steadily: in 1890-1900 the rate for native Hawaiians was 3.5 per thousand, in 1926-1930 less than 1. Decrease has been proportionately greater in the younger groups, in which formerly the higher rates prevailed. It is believed that the declining total rate reflects a diminished incidence consequent to or coincidental with general biological and environmental influences (which are put in evidence by falling death rates from other causes) rather than because of control measures. In the past 40 years there was much immigration from endemic areas which has influenced the racial composition of the population and has probably caused other biological changes. The proportionate racial distribution of leprosy has changed, and recently 40 per cent of admissions have come from the people more recently imported, whereas formerly 90 per cent were native. No evidence is found of a definite racial susceptibility; disproportions in certain racial groups may apparently be attributed to environmental factors.

Inquiries into family groups show that leprosy is readily communicable; the infection rates in such groups is often greater than in pulmonary tuberculosis among certain families studied in the United States. Among 996 members of 122 families (each with more than one child) 302 cases were admitted in the past 20 years, more than 30 per cent of the total family membership. From 14 of these families, with 4 or more children, 43 per cent of the 137 members were admitted. Children exposed when younger than 15 years are affected more frequently than those who are older when exposed. The readiness with which they or others develop the disease seems to be influenced by age at exposure, and duration and intimacy of exposure. Among 71 families from which a case was admitted during the past 15 years, there were 72 children aged 0 to 4 years remaining after the original case was admitted, 44.4 per cent of whom were subsequently admitted; of 64 children aged 5 to 9 remaining, 32.8 per cent were admitted subsequently; of 50 aged 10 to 14 remaining, 22 per cent were so admitted; and of 27 aged 15 to 19 remaining, 11.1 per cent were admitted. Considering all data, it appears probable that 40 per cent or more of all cases were infected before the age of 15.

The sex-ratio of admissions is about 1 female to 1.5 males. Incidence is higher in rural than urban districts; and in the former localities a lower average economic, sanitary, and dietary status prevailed among the affected families, and greater frequency of contact. The average economic status of approximately 100 leprous families was comparatively low. Their average diet is chiefly carbohydrates, low in milk, meat and butter fat, and seemingly low in calcium and vitamins B and C. However, no direct correlation between the leprosy rate and these conditions has been determined among this group of families.

—J. G. WOOLEY

GAY, F. P. The unsolved problems of leprosy. Science 81 (1935) 283-285.

This is a short discussion of leprosy problems. The author believes that chaulmoogra oil derivatives are effective, at least in ameliorating the symptoms and lesions of leprosy, and states that further attempts in this direction are indicated.

—J. G. WOOLEY

COWDRY, E. V. and HEIMBURGER, L. F. Morphology of the bacillus of rat leprosy. Proc. Soc. Exper. Biol. and Med. 32 (1935) 1422-1423.

Ziehl-Neelsen stained sections of tissue prepared by plunging into liquid air and dehydrating in vacuo while still frozen show bacilli that have smoother outlines and are much less granular than those stained after fixation in 10 per cent formalin or Regauds fluid. Similar observations were made on human tubercule bacilli.

—J. G. WOOLEY

ANDERSON, H. H. and ANDERSON, J. N. Iodine values and total lipids of leprous human blood sera. Proc. Soc. Exper. Biol. and Med. 32 (1935) 1470-1473.

The blood of 53 "cuta-neural" (mixed) cases were examined. The average iodine value for the group was 58 ± 15.9, the total lipids being 0.805 ± 0.161 gm/100 cc. Early "cuta-neural" cases, and cases improving under chaulmoogra

therapy, exhibited higher unsaturation of the fatty acids but lower lipids than did more extensively treated, advanced cases which were stationary or progressing.
—J. G. WOOLEY

STRACHAN, P. D. The effect of compulsory segregation of lepers in Basutoland. South African Med. Jour. 9 (1935).

Registrations of known patients conducted by the same means (through chiefs and headmen) in 1894-95 and in 1914 appeared to show that the number had trebled in 19 years. It is contended that in the absence of any form of segregation the number would have increased according to the law of compound interest; the only thing that might prevent such increase would be exhaustion of the susceptible soil. The views of Molesworth and Muir's criticism of them are discussed and it is concluded that, whichever of them may be right, the elimination of susceptibles in a period of less than half a century would be negligible. At the end of 1934 there were a little over 700 patients in the asylum, of whom about 25 per cent were early cases, and it was estimated that there could not be more than 300 outside, most of them in the incubation stage. In 1914 the number brought to light was about 600. Had these not been segregated their nosological descendants at the end of 1934 would have numbered $600 \times 3\text{-}21/18 = 2{,}020$. Thus not only would the number of patients have been more than double what it is today, but the character of the cases would have been very much worse.
—[AUTHOR'S ABSTRACT.]

MANALANG, C. Pathologic and bacteriologic survey of lepers. (Post Mortem.) II. Mo. Bull. Bureau of Health, Manila, **14** (1934) No. 11.

The author reports the histologic findings in tissues from right hands (balls of the fingers and hollow of the palm) that at autopsy appeared to be normal. Four of the cases had been bacteriologically negative and under periodical examination for from 2 to 9 months before death. Infiltrations of varying degrees were found in 18 cases; in only 2 were the tissues normal. *My. leprae* were found in 17 cases. The findings are interpreted to explain the localization of early leprotic lesions in children of lepers, resulting from frequent and prolonged skin-to-skin contact. It is believed that many supposedly "arrested" cases very likely still carry *My. leprae* in their hands and are a danger to the community; also that the anesthesia in the forearm of lepers with very limited or no skin lesion is explained by the findings, and that leprous infection of the nerves is probably always from the periphery. —J. O. NOLASCO

CRUZ, M. C. Trial of high fat diet and fixation-abscess in lepra reaction. Jour. Philippine Islands Med. Assoc. **15** (1935) 214.

Clinical trials of high fat diet, a combination of high fat diet and fixation abscess, and fixation abscess alone, were made in three groups of patients during the course of lepra reaction. The results, compared with a control group wherein antithermics, alkalies and tonics were used, were not encouraging. The author urges that continued effort be directed toward elucidating more thoroughly the mechanism of lepra reaction in the hope of discovering more rational modes of controlling it, or of provoking it when desired. —J. O. NOLASCO

LARA, C. B. and DE VERA, B. Clinical observations with reference to leprosy in children of lepers. Jour. Philippine Islands Med. Assoc. **15** (1935) 115.

Observations were made at irregular intervals in a group of 240 children born of leprous parents (113 males and 127 females), ranging in age from newly born to 10 years. For comparison a group of 78 children (36 males and 42 females) of nonleper employees at Culion, aged from 2 months to 8 years, was also examined. Types of suspected lesions noted included (a) "hazy pale areas" described by Chiyuto; (b) clear, markedly pale areas with more or less ill-defined borders; (c) pale or depigmented mottlings; (d) rough, scaly or granular areas (including ringworm-like lesions) with varying degrees of depigmentation and with or without reddish borders or surfaces; (e) goose-flesh, lichenoid, or follicular areas; and also (f) clear depigmented macules with definite borders; (g) red and pink macules; (h) papules; and (i) infiltrations, that represent the more familiar lesions in manifest cases of leprosy. The commonest type of suspected (i.e., unidentified) lesion found that could not be attributed directly to known nonleprotic skin affections was the "hazy pale area"; this was found in 96 per cent of all the children of lepers above one year of age. Suspicious reddish macules, found in a few cases, were transitory and bacteriologically negative. Suspicious papules were found in 7 cases, 4 of them bacteriologically positive, one of the others later identified as tuberculoid. Enlarged cutaneous nerves, anesthesia, and other evidence of nerve involvement were found in only a few cases.

With the exception of flushing of the legs, all the different types of "suspected" lesions found among the children of lepers were also seen in the other group, the most common being the hazy pale area, present in 50 per cent. A marked ichthyotic condition of the legs was more common among them than in the children of lepers. The findings suggest that not all of the inconspicuous changes seen in such children are of leprotic nature. —J. O. NOLASCO

CHIYUTO, S. Early leprotic changes in children and their bearing on the transmission and evolution of the disease. III. Mo. Bull. Bur. Health, Manila **15** (1935) 217-234.

The author analyzes the early changes seen during the course of four years observations of 82 children born of leprous parents, 40 of which have already been dealt with in previous reports. The subjects are between the ages of 2½ to 24 years, with a mean of 9.15 years. The investigation bears on the subjects indicated in the title rather than on the definition of "an unequivocal pathognomonic sign of early leprosy which clinicians usually seek." The following changes are especially discussed: (1) multiple hazy or definite depigmented macule, (2) minute papulo-vasicular eruption, (3) mild lichen leprosus, (4) intradermal nodule, (5) superficial sensory disturbances, and (6) other subsidiary signs, like flushing of the cheeks and earlobes and a flushed, shiny condition of the shin (Nicolas sign). Correlating clinical progress and histopathological findings in these skin changes, Chiyuto believes them to be leprotic. A graphic chart and tables demonstrate the age of occurrence of the changes discussed and their evolution, and the relation of clinical and pathological findings are also tabulated. The mean age of appearance of suspicous lesions is 4.92 ± 0.3658 years, that of

diagnosis of "early clinical leprosy" is 6.45 ± 0.3588 years, and of "advanced clinical leprosy" 9.05 ± 0.4475 years. The author believes that his findings strongly support Manalang's contention of adult immunity and infantile or child susceptibility. He suggests that in the study of the pathogenesis and epidemiology of leprosy the atypical and unrecognized skin lesions in children should be borne in mind, and believes that the confusion and paradoxes in the present knowledge are due to the use of the finding of the *My. leprae* as the criterion of diagnosis. —MARIANO B. LARA

NOCHT, B. and VELASCO, F. Some experiences in the treatment of leprosy by artificially induced fevers; preliminary report. Jour. Philippine Islands Med. Assoc. 15 (1935) 602-609.

In eleven selected cases of leprosy, all adult males between 20 and 50 years old, of which seven were C2-N1, two C3-N, and one C1-N3, all positive for *My. leprae*, without signs of tuberculosis or syphilis, the authors tried the effect of artificially induced fever. For this purpose they used "pyrifer," a sterilized suspension of nonpathogenic *B. coli*; "sulfosin," 1 per cent sulphur in olive oil; and "anaesthesulf," which is sulfosin containing anaesthesin. Pyrifer was given in 6 cases intravenously, sulfosin in 2 cases intramuscularly, and anaesthesulf in 3 cases intramuscularly. Each patient was given 2 to 4 series of injections in 4 months. Fever of 40°C. and over, lasting from 8 to 10 hours, was repeatedly induced in all cases and was fairly well tolerated. Improvement was noted in only one case, but in that one it was marked. The authors suspect that there is involved another, unknown factor, perhaps a special condition or phase of the leprous process, in cases in which there is marked improvement or cure following intercurrent infection accompanied by fever or resulting from hot-bath treatment. —MARIANO B. LARA

TOLENTINO, J. G. Sex susceptibility in leprosy. Jour. Philippine Islands Med. Assoc. 15 (1935) 374-377.

Tolentino has studied the sex incidence of leprosy among the 251 sons and daughters of 40 families in which one or both parents were leprous. Of the 132 males, 37 (28 per cent) developed the disease, while of the 119 daughters only 21 (18 per cent) acquired it. He suggests a hypothesis that, besides the factor of greater exposure to which males are subject, females may contain more iodine than males. He points out the beneficial effect of iodine in the treatment with iodized chaulmoögra ethyl esters; the increased incidence of leprosy (by almost 10 per cent) in girls at the age of puberty, when they are thought to consume much body iodine; and similarities in the manifestations of leprosy and hypothyroidism, in which the body iodine is believed to be decreased.—MARIANO B. LARA

BURGESS, P. Lepers and leprosy. Lep. Quart. 9 (1935) 167.

The author, president of the Leonard Wood Memorial, emphazises two distinct problems: welfare, concerned with giving food and shelter to lepers; and scientific, concerned with finding the means of eradicating the disease. With reference to the latter he points to the estimated number of cases in India and China, and discusses on the basis of Philippine experience the cost of segregating them all. Agreeing with those who are of the opinion that segregation is an

effective preventive measure provided all the lepers can be segregated, he recognizes the futility of attempting to do this in all parts of the world. He suggests that every country where leprosy constitutes a real problem should adopt a fourfold program: (1) propaganda to minimize the social disgrace attached to the disease and to teach the benefits of treatment; (2) medical research, especially with regard to treatment to improve present methods; (3) isolation and welfare work (encouraging private organizations to do such work), and the establishment of agricultural colonies organized and directed with a view to making them self-supporting; and (4) treatment of the majority of the lepers by the government. In this connection he advocated (a) the abolition of segregation laws, hospitalizing lepers chiefly as welfare work; (b) the giving of treatments in public clinics; and (c) the establishment of at least one research center in each country where leprosy is a real problem. —MARIANO B. LARA

SALLE, A. J. and MOSER, J. R. Bacteriology of leprosy. II. Growth and staining reactions of the organism inoculated into minced chick embryo medium. Proc. Soc. Exper. Biol. and Med. **31** (1934) 725-726.

The authors have worked with an acid-fast organism isolated from human and rat leprous lesions by tissue culture technique. This organism showed both acid-fast and nonacid-fast (diphtheroid) phases, the former most marked in actively-growing tissue cultures and disappearing as the tissues died. [This JOURNAL **2** (1934) 201]. To ascertain whether the acid-fast phase is characteristic of bacteria in general under similar conditions they tested 20 varieties, including the colon, dysentery, subtilis, diphtheria, xerosis and other bacilli, streptococcus and other cocci, and several fungi, including strains of yeasts and actinomyces. With exception of *Actinomyces violaceus* and *Saccharomyces cerevisiae* none proved acid-fast to 10 per cent sulphuric acid. It is concluded that acid-fastness under the conditions employed is not a characteristic of the true bacteria (Eubacteriales). —MARIANO B. LARA

SALLE, A. J. and MOSER, J. R. Bacteriology of leprosy. III. Growth and staining reactions of acid-fast organisms inoculated into minced animal tissues. Proc. Soc. Exper. Biol. and Med. **31** (1934) 727-728.

The authors continue the study dealt with in their preceding report. To determine whether the organisms referred to therein would become acid-fast when inoculated into minced tissues obtained from full-grown laboratory animals, they employed organs of rabbits, guinea pigs and rats minced in Tyrode solution. Growth occurred within 48 hours except with rat tissue, where it was very poor; the best results were with guinea-pig tissues, where there were many acid-fast organisms. Pigment production was enhanced in the rabbit tissue medium, normal in others. The organisms lost their acid-fastness after about 5 days. The authors conclude that living embryonic tissue is not necessary for the occurrence of the acid-fast form. —MARIANO B. LARA

SOULE, M. H. Bacteriology of leprosy. III. Cultivation of *Mycobacterium leprae*. Proc. Soc. Exper. Biol. and Med. **31** (1934) 1197-1199.

The author mentions earlier studies (McKinley and Soule) in Puerto Rico on the cultivation of the human leprosy bacillus, in which there was obtained,

under an atmosphere of 40 per cent O_2 and 10 per cent CO_2, a slow-growing non-chromogenic acid-fast organism which has been maintained in subcultures but which has continued to grow sparsely. This work was repeated in the Philippines—in another part of the world and with another race—using excised nodules, subepidermal pus from lepra reaction cases, and broken down nodules. Autoclaved materials from the same sources were used as controls. Growths were obtained in 25 out of 42 specimens cultured. The colonies and the morphological and tinctorial characteristics of the organisms were identical with those of the organisms previously described. In minced chick embryo medium multiplication occurred, but transfers to solid media (Petragnani and Loewenstein) grew no more luxuriantly than the cultures grown originally on these media. Growths obtained in tissue cultures by the original technique of Carrel were no more luxuriant than those in macerated chick-embryo tissue. The author points out that the ideal media and environment for saphrophytic existence of this organism have not yet been provided. —MARIANO B. LARA

SOULE, M. H. Bacteriology of leprosy. IV. Bacteremia. Proc. Soc. Exper. Biol. and Med. 31 (1934) 1200-1201.

Utilizing 10 cc. of blood from each of 462 Culion patients with advanced leprosy, the author cultured 200 specimens according to the technique of Loewenstein (using the centrifuged deposit of laked blood), while another 200 were transferred untreated to large tubes of cooked beef-heart broth. With the remaining 62 specimens only the blood clot was cultured, in glycerol infusion broth. No growths were obtained. The author finds difficulty in interpreting these negative results in the light of many recent studies on the isolation of organisms from the blood stream in health and disease, and suggests that treatment with iodized ethyl esters of *Hydnocarpus wightiana* oil may have had a direct influence on the incidence of bacterial blood-stream invasion.

—MARIANO B. LARA

MCKINLEY, E. The etiology of leprosy. Medecine 13 (1934) 377-504.

This 128-page article, with 525 references, is a thorough review of the entire subject of the bacteriology of leprosy and is hardly susceptible to abstracting; it must suffice to note the topics discussed. After a brief and necessarily incomplete note on the history of leprosy, there are taken up the discovery of the bacillus, the methods of study used, the many attempts to cultivate it and the organism isolated in that work, the chemistry of certain of the acid-fast bacteria so obtained, and experimental work with animals. Under the general heading "newer knowledge of the bacteriology of leprosy" is, first, a critical evaluation of previous knowledge of Hansen's bacillus, the conclusion being reached that none of the organisms cultivated before 1918 "were established *beyond question as true leprosy germs.*" Then follows a survey of the cultivation of the bacillus since that date on solid media and in tissue cultures, and also animal experiment work. Significantly, the date mentioned is that of the publication by Wherry and Ervin of a note on the CO_2 requirements of *My. tuberculosis.* The work of the various investigators in this field is given due attention, but that of the author with Soule and other coworkers is gone into in considerable detail. Only two reports other than those of the author are mentioned in connection with

tissue culture work. Though he is clearly confident that the organism which he and Soule isolated in Puerto Rico, and the latter obtained again later in the Philippines, actually represents the leprosy bacillus [and with this opinion the reviewer must agree], he says in his summary that "... it must be stated today, sixty years after Hansen first saw *Mycobacterium leprae*, that *there exists no absolute proof as yet* that any investigator during all of these years has actually succeeded in cultivating *Mycobacterium leprae* in vitro"—a scrupulously conservative statement that has led to some misunderstanding of his own present position in the matter. —H. W. W.

BURNET, E. The League of Nations and leprosy. Information Section, League of Nations, 1934.

This document, distributed widely in mimeographed form and reproduced or extensively abstracted in several periodicals, is a review of activities connected with leprosy in which the League of Nations has taken part. Note is made of the different organizations which are concerned with the problems of leprosy or lepers. It is pointed out that, since leprosy is a world-wide disease and a source of anxiety to so many governments, it is both natural and necessary that the League should take a part in this international work; the multiplicity of existing organizations is an argument for rather than against such a course. A considerable part of the report deals with the new leprosy study center at Rio de Janeiro [which has been mentioned repeatedly in the JOURNAL, and of which a description will be published shortly]. —H. W. W.

[TANGANYIKA.] Report of the Director of Medical and Sanitary Services, 1933.

For some years medical officers in Tanganyika have been puzzled by finding acid-fast bacilli in the sputum of natives with a chest disease which clinically is either not tuberculosis or is an unusual variety of that disease. In 1933 Dr. Charles Wilcocks undertook a study of this problem, from which it appears that an acid-fast "bacillus" that resembles *Mycobacterium tuberculosis* in morphology and staining reactions but that is nonpathogenic to laboratory animals and cannot be cultivated artificially is not uncommonly found in the sputum of natives suspected of early tuberculosis of the lungs, or who have a cough which is not considered to be due to tuberculosis. [It is not said whether this organism is obtainable from the sputa of natives with neither cough nor suspicion of lung disease.] Since these organisms are not pathogenic to guinea pigs they cannot be *My. tuberculosis*. That they are saprophytes of the nature of *My. phlei* is unlikely, for all the nonparasitic mycobacteria are readily grown in culture, but they might be a harmless parasite similar to or identical with *My. smegmae*. However, it seems most probable that they are *My. leprae*. If that is so their discovery "constitutes a point of importance in the epidemiology" of leprosy of most decided interest, but not an unexpected one, for there is a growing belief in the East that the infection of leprosy is usually by droplet deposition upon the nasal mucous membrane, and that the first state of the disease is respiratory. It is just possible that leprosy has a relationship with tuberculosis somewhat comparable with that of yaws with syphilis. [From abstract in *Med. Officer*. London, (1935) April 20.]

BERON, B. Zur Leprafrage im Bulgaria. [Leprosy in Bulgaria.] Clin. Bulg. (1934) No. 4.

The author states that the number of cases of leprosy observed in Bulgaria in the last 50 years is 23, and adds 2 cases observed by him. In his opinion the number reported is hardly in accordance with actualities and should certainly be greater, since the disease is not sufficiently known among Bulgarian physicians. The measures that should be taken to combat the disease are the establishment of a leprosy station at the skin diseases clinic of the University of Sofia, where students and physicians may have an opportunity to see cases of the disease, instruction of the populace as to its nature and appearance, facultative isolation of lepers and prohibition of their immigration. [From a translation by Dr. A. C. Santos of abstract in *Deutsche Med. Wchnschr.* (1935) 243.]

SIMONS, L. H. De Lepra on het eiland Ambon. (Een bijdrage tot de kennis omtrent het besmettelijkheidsvaagstuk der lepra.) [Leprosy on the island of Ambon. The question of its infectivity.] Medeed. Dienst Volksgez. Nederlandisch-Indië **22** (1933) 197-208.

The author considers the island of Ambon (Molucca group) peculiarly suitable for the study of leprosy because of its common occurrence there. He holds that in view of the closeness of contact which exists among the inhabitants, the frequent freedom from leprosy is not favorable to the view of direct infection and favors the idea of an inherited predisposition. The leper in Ambon is not debarred from mingling with others, yet the disease is strikingly incident in certain families, and in certain places it might be called a family disease. Among 157 marriages in which one or both parties were leprous, in only two instances could it be regarded that infection had occurred after marriage. These facts the author thinks are best explained on the ground of an inherited congenital predisposition. The data on frequency distribution of the appearance of the disease in the age groups 1-5, 6-10, 11-15, 16-20, 21-25, 26-30, 31-35, 36-40, 41-45, 46-50, 51-55 and over 55, are 5, 32, 49, 53, 61, 21, 26, 19, 9, 12, 8 and 7 cases, respectively. A peculiar area distribution is seen, with a very high incidence in Leitimor and a low incidence in Hitoe. These two portions of the island are connected only by a narrow peninsula; the former area is inhabited mainly by Christians, and the latter by Mohamedans, so that it seems probably that this marked difference is based on some distinctive habit or mode of life. The fish theory of leprosy is only mentioned to be dismissed, and the rôle of the rat is suggested for further investigation. [From abstract by W. F. Harvey, in *Trop. Dis. Bull.* **31** (1934) 541.]

MONTAÑES, P. and NEGRO, E. Primer síntoma objetivo en los leprosos españoles. [The first objective symptom of leprosy.] Rev. San. e Hig. Publ. **9** (1934) 210-215.

The authors point out that in the slow course of the disease the early symptoms are often forgotten, but believe that information concerning them is of prognostic and therapeutic value. They found that macules were by far the most common, occurring in 126 (30 per cent) of the patients investigated. Nodules were next, but considerably below, reported by 67 cases (16 per cent); they were

most commonly seen first on the face and then, in order, the lower limb, upper limb and trunk. Next commonest were neuritis, in 50 cases (12 per cent), and then pemphigus in 40 cases (9.5 per cent), most often on the legs, later on the arms; in no case did the pemphigus occur on the face, and neuritis of the face was very rare. After these came rhinitis, in 35 cases (8.5 per cent), "acute" lesions (i.e., lepra reaction) in 22 cases (5.0 per cent), and loss of eyebrows in 17 cases (4.7 per cent). Other conditions such as anesthesia, edema of legs, and ulcers were very rare in their experience (from 3.1 to less than 1 per cent). With regard to prognosis, the authors state that macules, tubercles, rhinitis, lepra reaction or loss of eyebrows at the beginning indicate a severe cutaneous form, probably of shorter duration than the nervous variety and liable to painful intercurrent lesions. On the other hand early symptoms of neuritis, pemphigus or anesthesia indicate the nerve type and a milder disease, with little or no tendency to intercurrent affections and likely to have a more prolonged course. Also, if the disease commences with rhinitis, loss of eyebrows, or acute lesions great care must be exercised in treatment, as these are usually associated with the presence of bacilli in large number, and their evolution is rapid. Those with early pemphigus and neuritis have fewer bacilli and are of slower evolution, and they exhibit a greater tolerance in treatment. [From abstract by H. H. S., in *Trop. Dis. Bull.* **31** (1934) 545.]

YOSHIMURA, Y. Ueber die Function der Schweissdrüsen an der leprösen Flecke. [Function of sweat glands in leprous patches.] Japanese Jour. Dermat. and Urol. **35** (1934); suppl., 17-19 (summary in German).

Skin lesions in various stages of development and activity in about 100 patients were tested for the normal loss of water (perspiratio insensibilis), and also while in the sweating state, induced by increased temperatures and pilocarpine. On the general body surface (exclusive of palms and soles) the loss of water in the nonsweating state seems to be chiefly that of transpiration, the sweat glands apparently not taking part in the process. This is concluded because leprous areas, where the infiltration and inflammatory reaction are not pronounced, do not show a loss of water much different from that of the rest of the body. This conclusion does not apply in the case of the skin of the palms and soles, where there is a noticeable diminution of loss of water in the diseased areas as compared with the remaining skin, postulating pathological inhibition of the sweat glands in these macules. In the sweating state the actively hyperemic areas show an increase in loss of water over that of the normal skin areas. However, in macules where there is no longer evidence of inflammatory activity (secondary leukoderma) there is a decrease of sweat, and in those of these areas that are markedly infiltrated there is at times actual anhidrosis. That this anhidrosis is not purely neurogenic is shown by the fact that when the infiltration is diminished in these areas a moderate amount of sweating reappears. [From abst. in *Arch. Dermat. and Syphil.* **30** (1934) 275.]

LAI, D. G. The dextrose tolerance test in leprosy. American Jour. Trop. Med. **14** (1934) 575-584.

Sixty patients and one normal control were tested. The mean basic metabolic rate was 62.7. The fasting blood sugar rate varied from 62 to 124 mgm. per 100

cc., and averaged 88.5 mgm. The composite blood sugar curve was considered normal. During the test 58 per cent showed glycosuria one or more times. In 27 per cent high, and in 19 per cent flat, curves were seen, and the renal threshold was usually low. Thus, in spite of individual variations, uncomplicated leprosy tends to give a normal blood sugar curve, and glycosuria is apparently due to a low renal threshold commonly occurring in leprosy. [From abstract by L. R. in *Trop. Dis. Bull.* 32 (1935) 337.]

STEIN, A. A. Ueber Leprareaktion. [Lepra reaction.] Acta Derm. vener. **15** (1934) 314.

The author, discussing lepra reaction (lepra fever), which presents a spontaneous exacerbation in the clinical picture of the disease, classifies the condition as of three groups: (1) eruption of new lesions, (2) inflammatory aggravation of old lesions, and (3) a combination of the first two. The inflammation may be very acute, acute, or subacute; severe reactions are often accompanied by high fever and sometimes delirium, and death may follow. In the author's experience the first type has predominated, 59 per cent; 23 per cent were of the second type, and 17 per cent of the third. Most commonly the reaction lesions were on the extremities, next in order of frequency on the extremities and face, and finally on the face alone. In about 7 per cent of all the cases clinical cure resulted, but in the others the lesions were markedly aggravated by the reaction. [From abstracts.]

NATALI, C. Reperti istologici e patogenesi delle seguenti alterazioni nella lepre. I. Alterazioni delle ghiandole a secrezione interna. II. Ganglioneurite solare (2 casi). III. Cancro e lepra. [Histological findings and pathogenesis of the secondary changes in leprosy. I. Endocrine glands. II. Ganglioneuritis. III. Cancer.] Sperimentale 88 (1934) 251.

Two cases of neural leprosy were studied. The *pineal body* showed simple and adenomatous hyperplasia of the younger tachiochromic cells. In the *hypophysis* there was hyperplasia of the eosinophilic cells, partly with eosinophilic granulations but mostly with homogeneous cytoplasmic eosinophilia. The aggravation of such changes in the point of adenoma may explain cases of acromegaly in leprosy described by the author and others. The *thyroid* showed diffuse colloidal stroma with basophilia of the colloidal substance and proliferation of the epithelium. These findings would suggest the usual Basedow-like hyperthyroidism, which the author has observed in lepers. The *suprarenal glands* contained inflammatory lesions (lymphocytes, plasma cells and histiocytic infiltration), with atrophy of the neighboring substance in one case. The signs of hypoadrenalism which the author observed were dependent not only upon the location of the leprous processes in the glands but also on destructive inflammatory changes of the plexus solaris. In the *testes* were seen leprous orchidoepididymitis with secondary atrophy and complete sclerosis of the parenchyma, findings which would correspond to hypogenitalism, gynecomastia and delayed puberty. In the *pancreas* there was decrease of the islands of Langerhans in one case. The author has established a leprous inflammation of the ganglion solare which would correspond to the familiar changes in the peripheral nerves in neural leprosy. In total the disease produces changes in the endocrine glands (especially in

the testes) and in the sympathetic nervous system which on the whole play a large role in the general picture of the disease. The skin changes and their sequelae may provide the site for cancerous change; in one of these cases a small nodule showed, quite unexpectedly, a beginning basal-cell carcinoma. [From a translation by Dr. A. C. Santos of abstract by G. Patrassi in *Centralblatt* (1935) 305-306.]

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