

## CURRENT LITERATURE

To survey adequately the current literature of leprosy is one of the most important objectives of the JOURNAL. The Contributing Editors are expected, so far as possible, to make sufficiently full abstracts of the more important articles to afford a clear understanding of them. Since authors' abstracts are generally to be preferred, readers are invited to submit abstracts of their own articles which have been published elsewhere.

TISSEUL, J. Contribution à l'étude des réactions cutanées dans la lèpre. Dissociation des réactions dermique et sous-cutanée dans un cas de lèpre tuberculoïde. [Contribution to the study of cutaneous reactions; dissociation of cutaneous and subcutaneous reactions in a case of tubercloid leprosy.] *Bull. Soc. Path. Exot.* 26 (1933) 576-579.

The author's observations have been made on two cases of leprosy. In one, which had only two macules, the subcutaneous injection of a suspension rich in human leprosy bacilli resulted in the formation, in 48 hours, of a nodule in the proximity of one of the macules and in an abscess in the healthy skin. The same material gave no reaction in the second case, in which the surface of the body was covered with tubercloid macules. On the other hand intradermal injections caused the formation of nodules in 48 hours in both cases.

—M. LEGER (TRANSLATED).

SEZARY, VAUDREMER AND BRUN. Essais de vaccino-thérapie anti-lépreuse. [Attempts at vaccinotherapy.] *Bull. Soc. Français Dermatol. et Syphil.* (1933).

The patient treated was an Indo-Chinese of 19 years, with cubital griffe and a large tawny plaque over which there was thermo-analgesic dissociation of sensibility. Treatment consisted of injections of a lysate of bacilli obtained by the authors' method of cultivation. After 32 injections the pigmented plaque had disappeared and the disturbances of sensation had diminished.

—M. LEGER (TRANSLATED).

TOURAINE AND RIBADEAU-DUMAS. Lèpre mixte traitée par vaccino-thérapie. [Mixed leprosy treated by vaccinotherapy.] *Bull. Soc. Français Dermat. et Syphil.* 40 (1933) 229-235.

An attempt at vaccinotherapy of a leper with the Vaudremer vaccine. The results were encouraging; the coryza disappeared, ulcerations of the face and hands dried up and the lepromata decreased in size in a month. Subsequently the improvement diminished.

—M. LEGER (TRANSLATED).

VIALARD, VERLAC AND BERGE. Un cas de lèpre mixte à incubation prolongée. [A case of mixed leprosy with prolonged incubation.] *Bull. Soc. Méd. Hop. Paris* (1933).

The patient's first symptoms were observed eleven years after his return from New Caledonia and simultaneously with manifestations of renal insufficiency.

—M. LEGER (TRANSLATED).

MARKIANOS, J. La bacillémie et la fièvre lépreuse. (Bacillemia and lepra fever.) *Ann. Dermat. et Syphil.* 4 (1933) 220.

In the course of tubercular leprosy, but never in the nervous form, the cases present febrile periods that sometimes persist for many days. During these periods one can easily find the bacilli by the examination of thick drops of the blood. These febrile periods often resemble those of malaria; they indicate a generalization of the infection and may be accompanied by new cutaneous manifestations, as macules, urticaria, or scarlatiniform eruptions. Trypaflavine given intravenously seems to be the only medicament effective against this lepra fever.

—M. LEGER (TRANSLATED).

PALLARD AND MASSON. Lèpre à forme poly-névritique. [Poly-neuritic form of leprosy.] *Lyon-Méd.* 151 (1933) 429.

A patient 24 years of age, who had previously lived for three years in Cameroun, was diagnosed by the authors as leprotic though they did not find the bacillus. The diagnosis was based on the existence of hypertrophy of different nerve trunks, depigmented and anesthetic scars, and a polyneuritis of the four limbs with a predominance of disturbances of sensation. The Wassermann and Hecht reactions behaved as in a syphilitic.

—M. LEGER (TRANSLATED).

TARAZONS. La lutte antilépreuse en Amérique du Sud. [The antileprosy campaign in South America.] Thèse de Doctorate en Médecine, Montpellier, 1932. Causse, imprimeur.

There are two great foci of leprosy in South America. One is in the north, with about 31,000 cases in Colombia, the Guianas and the northern part of Brazil. The other is in the south, with some 34,000 cases in the Argentine, Uruguay, Paraguay, and southern Brazil. Between the two there are few lepers (central Brazil, Bolivia, Peru, and Chili). In view of its development it is important that there be organized an effective fight against it by the close collaboration of the public authorities, the physicians and the people themselves, utilizing in this the studies of hygienists and microbiologists.

The second part of this thesis deals with treatment and prophylaxis, recalling the principles laid down by the recent leprosy congresses, and the third part with the organization of the social campaign, the author showing the important part which should be played by the International Association of Leprosy and the International Center at Rio de Janeiro. He believes that a second center should be established for the northern focus at Bogota. In a tabulation he shows the dispensaries and special establishments concerned with leprosy, showing that in certain countries, as in Colombia, segregation does not yet exist or is directed, with reason, toward the mixed system by the creation of dispensaries.

—M. LEGER (TRANSLATED).

DE MAZIERES, M. La lèpre dans les Doukkala-Sud, a travers la médecine arabe et la tradition orale. [Leprosy in the South Doukkala in Arabic medicine and oral tradition.] *Bull. Inst. Hyg. du Maroc* (1932) 24.

A very interesting dissertation on leprosy in the Arabic books on medicine. The author describes the disease as it has been seen by the Arabs, ancient and

modern, and inquires into what was done against leprosy in Morocco, and particularly in the south Doukkala, before the establishment of the French protectorate. He finally describes the position of the lepers since the protectorate.

—M. LEGER (TRANSLATED).

MANALANG, C. Transmission of leprosy. II. Evidences of transmission in infancy, or early childhood. *Mo. Bull. Philippine Health Serv.* 12 (1932) 363.

The author cites the cases of leprosy developing in children born of leprosy parents, as reported from Hawaii (Hollmann) and Culion (Gomez et al, Rodriguez), and explains the prevalence of scalp leprosy in Japan. Cases of supposed institutional contagion (as those of Doctor Benson and Father Danien) are held to be based on unscientific evidence. The failures of 145 experimental human inoculations are considered proof of adult immunity. Chiyuto's results with the leprolin reaction are also cited as confirming the conclusion of infantile susceptibility and adult immunity. It is concluded that infection is contracted by the infant or young child, but not by the adult.

—J. O. NOLASCO.

MANALANG, C. Leprosy; etiology, transmission and the causes of slow progress in its prevention. *Mo. Bull. Philippine Health Serv.* 12 (1932) 378.

The finding of bacilli in histologically normal skins of lepers, and the observation that infants though infected with bacilli through the umbilical cord do not develop leprosy if removed at birth to non-leprosy environments, are considered evidences of inactivity of the bacilli. The effect of resistance-lowering factors, the high incidence of confirmed or suspicious lesions in children of leper parents, Chiyuto's observations on leprolin reactions in infants and children, and Henderson's study of the hypopigmented macule are discussed. It is pointed out that parents with neural leprosy have infected their children, though not to the same extent as cutaneous cases. It is concluded that a non-acid-fast stage of the organism is probably the etiological agent of the disease; that the acid-fast bacillus stage is inactive; that the disease is acquired during infancy or early childhood by repeated and prolonged skin to skin contact with a leper, the adult being immune; and that the bacteriologically negative leper is also a transmitter of the disease. The author believes that the fundamental cause of the delay of the progress of prophylaxis against leprosy is the persistent attitude of leprologists that (a) *M. leprae* is the cause of leprosy, (b) that only the bacteriologically positive lepers are infective, and (c) that leprosy can be contracted by the adult.

—J. O. NOLASCO.

CHIYUTO, S. Leprolin test. *Mo. Bull. Philippine Health Serv.* 12 (1932) 300.

Leprolin, prepared by Hayashi's method, was used in three groups of individuals: 169 children of leprosy parents (5 days to 16 years old), 97 healthy children of non-leprosy parents in a rural community, and 10 healthy adults. The author concludes that the negative reaction in children under one year in the first two groups may be considered as lack of resistance to leprosy, and that results in healthy children 1 to 3 years of age indicate this to be a border line in which they are building up a natural resistance against leprosy.

—J. O. NOLASCO.

✓ MANALANG, C. Significance of leprolin reaction in the natural and experimental transmission of leprosy. *Mo. Bull. Philippine Health Serv.* 12 (1932) 308.

The author summarizes the results and interpretations of the leprolin tests by different observers. Mention is made of the similarity of the tissue reaction (histologically) at the site of positive tests in human beings and in experimental animals. Chiyuto's findings on tests in three groups of individuals are cited to support the belief that the infection in leprosy is probably contracted in infancy and early childhood, the adult being insusceptible. He suggests the trial of leprolin as a prophylaxis against infection among the infants of lepers and its value for prognosis in lepers. —J. O. NOLASCO.

LAGROSA, M. Changes in the anesthesia following anti-leprotic injections of iodized *Hydnocarpus wightiana* ethyl esters. *Jour. Philippine Islands Med. Assoc.* 12 (1932) 604.

Of eight patients with symmetrical areas of anesthesia without frank leprotic involvement, four were given intradermal and four subcutaneous injections on one extremity weekly for 5 months, the other extremity being left untreated; routine intramuscular and intradermal injections were also given in other parts of the body. When the patients were examined finally six months after the last treatment, the intradermal method was found to be slightly the more effective method, though the author recommends a combination of the two. The tactile sense returned first, the thermal was the last—if it returned at all. Reappearance of perspiration in the anesthetic areas and partial to apparently complete restoration of muscular strength in the treated extremities were also observed in some of the cases. —J. O. NOLASCO.

MUIR, E. Some factors influencing the nature of leprosy lesions. *Lep. in India* 6 (1934) 1.

This paper is an attempt to use results of the leprolin test in explaining the nature of leprosy lesions commonly seen in North India. The normal positive result is modified by: (1) age, it being often negative in young healthy children; (2) debility, it often being diminished in debilitated non-lepers; (3) hyper-infection, it being negative in cutaneous cases with many bacilli. The lack of infiltration and induration of the macules often seen in young children may be due to lack of power of the tissues to react to the bacilli owing to the age factor. The greatly indurated macules, often with thickened nerves, seen in neural leprosy may be explained by the powers of the tissues of these adults to react markedly to the bacilli. The fading and disappearing of such indurated macules, which is often seen when some debilitating factor supervenes, may be explained by the debility factor removing the power of the tissue to react to bacilli. This disappearance of the powers of tissue to react, though accompanied by an apparent disappearance of the lesions, is often followed by marked spread of the infection until the hyper-infection factor comes into play; then, even if the debility is removed, the power of reaction does not return and the case becomes a progressive cutaneous case. The apparent diminution of lesions under every energetic treatment may be caused by the debility induced by the treatment removing the reacting powers of the tissues. Muir considers that the view expressed by various workers that patients infected

in childhood show a far greater tendency to develop into cutaneous cases than those infected in adult life may possibly be explained by the lack in children and the presence in adults of the power of the tissues to react and limit the infection. He thinks that the condition of lepra reaction in cutaneous cases may possibly be due to a temporary return (caused by some unknown factor) of the power of the tissues to react to the bacilli, making lesions visible which were previously invisible and causing swelling of old lesions; he realizes, however, that there are difficulties connected with this view. —J. LOWE.

RYRIE, G. A. Cases of leprosy seen in the Federated Malay States. *Lep. in India* 6 (1934) 4.

Ryrie, saying that there are very definite variations in the type of leprosy in different countries, points out the differences he has observed in the different peoples seen in Malaya; these are Malays, South Indians and Chinese. He finds that 40 per cent of South Indians show pure nerve leprosy, but only 25 per cent of Chinese. Lepra reaction is much more common in the Chinese than in the Indians, and the death rate twice as high. He states that we cannot assess the effect, if any, of racial immunity in accounting for these differences, and attempts to relate them with differences in diet, habits, etc. He finds that the Indian has more effective mouth, bowel and skin hygiene than the Chinese, but the Indian diet is poorer. He notes the rarity of glycorusia in leprosy and the frequent disappearance of manifestations of leprosy if toxæmia due to some other disease supervenes. He discusses the treatment of nerve pains, leprotic ulcers and lepra reaction. In lepra reaction he has found alkalis of no benefit, potassium-antimony tartrate of some use, but fluorescein (20 cc. of 2 per cent solution intravenously, twice weekly) most useful.

—J. LOWE.

GASS, H. H. AND RISHI, D. P. Examination of the bone marrow for *M. leprae*. *Lep. in India* 6 (1934) 8.

In sixty-nine cases the bone marrow was examined. Most of the material was from necrosed bone removed at operation, the rest being obtained post-mortem. The bones examined included phalanges, metatarsals, radius, ulna, and tibia. In 48 neural cases no bacilli was found in the bone marrow, while in 21 cases showing cutaneous lesions 17 were positive. These findings confirm the connection between leprosy infection and the reticulo-endothelial system.—J. LOWE.

IGARASHI, T. [Erythema nodosum leprosum brought about by vaccination.] *La Lepro* 5 (1934) 129.

In June and July, 1933, in the Tokyo leprosarium, 819 patients were vaccinated. Among the 600 in whom it took effect, 80 showed a remarkable lepra reaction and developed symptoms of erythema nodosum. —M. Ota.

TAJIRI, S. ET AL. [Diet treatment in erythema nodosum leprosum.] *La Lepro* 5 (1934) 140.

In Japan it has been believed that a meat diet makes leprosy symptoms worse, so lepers are in the habit of avoiding that diet. But when pork, beef or rabbit meat (30 grams a day) was given to 44 lepers having rather chronic erythema nodosum leprosum (lepra reaction), very good effects were observed



in 22, and some benefit in 9 others. From these results the authors think that a meat diet should be recommended for that type of the disease. —M. OTA.

EMERSON, G. A., ANDERSON, H. H. AND LEAKE, C. D. Comparative biological activity of seven new water-soluble chaulmoogric acid derivatives. *Proc. Soc. Exper. Biol. and Med.* 31 (1933) 274.

Continuing studies with the standardized technique introduced by Anderson *et al* (This JOURNAL, 2 (1934) 39), antileprosy activities of alepol, choline chaulmoograte, Na chaulmoogryl-o-aminobenzoate, Na diethylethanolammonium chaulmoograte, K iodo-dihydrochaulmoograte, Na chaulmoogryl glycinate, Na chaulmoogryl glutamate and Na dichaulmoogryl-B-glycerophosphate ("chaulphosphate") were compared. Most of these compounds were prepared by Dr. Richard Wrenshall of the University of Hawaii.

On the basis of the comparison of solubility, acute subcutaneous and intravenous toxicities in rats, total dose tolerated by treated leprosy rats over six months, the number of deaths during treatment, average weight variations in treated rats, average size of lepromata at end of treatment, the total number of sloughs occurring during treatment, the *in vitro* bactericidal activity against *Myc. leprae*, the minimum *in vitro* hemolytic concentration, and the local effects at the site of injection in normal rats, chaulphosphate appeared far superior to any of the other drugs, including alepol. —[AUTHORS' ABSTRACT.]

EMERSON, G. A. AND SALLE, A. J. *In vitro* leprocidal activity of some non-chaulmoogryl compounds. *Proc. Soc. Exper. Biol. and Med.* 31 (1934) 428.

Previously but little attention has been paid to the bactericidal activity against *Myc. leprae* of compounds other than derivatives of fats and oils, although many clinical trials of non-chaulmoogryl antileprosy drugs have been made. The activities of some 200 compounds are now reported, *in vitro* tests being carried out by Adam's technique on a strain of the leprosy bacillus isolated by Walker. Four classes of compounds were examined; dyes, organic metallic compounds, fatty acids derived from chaulmoogra, hydnocarpus, calophyllum and castor oils, and a class of compounds chosen to mimic certain properties attributed to chaulmoogric derivatives. High activity was found especially for merthiolate, metaphen, mercurochrome, solganol, triphenylmethane dyes, methylene blue and octyl resorcinol. Trypan blue and the aliphatic alcohols were surprisingly inactive. Although a correlation between therapeutic value and leprocidal activity is apparent, bactericidal tests alone cannot be used as a basis for clinical trial without a comprehensive pharmacological evaluation such as recommended by Anderson, *et al.* (This JOURNAL, 2 (1934) 39).

—[AUTHORS' ABSTRACT.]

EMERSON, G. A. Ineffectiveness of four non-chaulmoogryl antileprotics in experimental rat leprosy. *Jour. Pharmacol. and Exper. Therap.* (proc.) in press.

Evaluation of 4 non-chaulmoogryl antileprosy drugs was made by Anderson's method (This JOURNAL) using experimentally infected leprosy rats. Na cyanocuprol, recommended by Japanese workers for use in human leprosy; Na thioglycolate, previously found by us to be highly leprocidal *in vitro*; Na di-

nitrophenolate, which produces artificial fever and so simulates fever therapy with malaria or kala-azar, and also causes a supposedly favorable phenolization, and a defatted human cultured leprosy bacillus antigen, for comparison with Markianos' corresponding rat antigen and BCG experiments, were tested. All were without appreciable action as observed over a period of 150 days. The cumulative intraperitoneal doses and single acute intraperitoneal m.l.d.'s in normal rats are recorded. A marked increase in weight and relatively slower progression of the lesion, together with the absence of sloughs in the thioglycolate treated animals was noted, but none of the drugs seems sufficiently efficient to warrant further study. —[FROM AUTHOR'S ABSTRACT.]

STEIN, A. A. AND STEPERIN, M. I. [On the distribution of bacilli in lepers.] *Norsk Mag. Laegevid.* (1934) No. 3.

The writers report from Leningrad the results of comparative examinations of the nasal mucus, tissue serum from cuts made in sound skin on the upper arm, and the contents of CO<sub>2</sub>-snow blisters of the same areas. All the 97 patients were examined, and also the nasal mucus of 49 of the hospital staff. The patients were classified as in the following tabulation of the findings in skin and blister fluids.

Class of Case	Skin Positive	Blister Positive
Lepra tuberosa (53 patients) . . . . .	34 per cent	35 per cent
Lepra mixta (11 patients) . . . . .	36 per cent	18 per cent
Lepra maculo-anesthetica (9 patients) . . . . .	11 per cent	11 per cent
Lepra nervorum (16 patients) . . . . .	25 per cent	25 per cent
Lepra latens (8 patients) . . . . .	37 per cent	37 per cent

The writers point out that bacilli have fairly often been obtained in sound skin of patients with forms of the disease in which bacilli are hard to find. That they were found in the nasal mucous from cases of both maculo-anesthetic and nodular forms is a familiar circumstance, but that they were also found in 3 of the 8 cases of lepra latens the reviewer considers surprising; it has not been possible to obtain similar results in the Pleiestiftelsen No. 1, in Bergen. None of the staff was positive. —R. MELSOM.

FENG, C. T. The use of benzylephedrine as an analgesic in chaulmoogra injections. *Chinese Med. Jour.* 48 (1934) 563.

After pointing out the objections inherent in the use of chaulmoogra oil and its preparations, the author calls attention to Johansen's method of using benzocaine and olive oil with chaulmoogra oil to obviate the occurrence of pain on injection. He states that benzylephedrine is nearly thirty times as effective as benzocaine and suggests for use a formula of chaulmoogra oil 800, olive oil 200, and benzylephedrine 1. The mixture is well tolerated and it is claimed that larger intramuscular doses can be given with less pain if this preparation is used. —J. L. MAXWELL.

STRAHAN, P. D. A note on the treatment of granulating wounds and ulcers. *South African Med. Jour.* 7 (1933) 397-398.

In a wound free from virulent infection, frequent removal of dressings and antiseptic washings mechanically remove the young epithelial cells and in-

hibit the growth of those that may be left, and also remove the discharges which, it is believed, form a culture medium for the cells. Consequently, after removing dead tissue from an ulcer and rendering it free from pyogenic infection by wet Dakin's compresses (or, in some cases, methyl violet), the author covers the ulcer and a margin of healthy skin with a strip of elastoplast which is left on for two to four weeks. Discharges which ooze through the plaster are wiped off, and the surface is dusted with boric acid powder which forms a dry odorless crust. As Davies contends, wool dressings should not be applied over the elastoplast to avoid an offensive odor. It is not necessary to bandage the whole limb from its extremity except in the case of varicose ulcers. In cases of leprosy large ulcers of the legs which would not heal under daily dressings became covered with epithelialised scar tissue in a few weeks. Perforating ulcers of the sole are more obstinate, but are never the worse and often the better. Besides giving far better results this treatment effects an enormous saving of time and surgical material. —[AUTHOR'S ABSTRACT.]

AMBROGIO, A. [Clinical and experimental observations on the allergic phenomena of leprosy.] *Pathologica* 25 (1933) 514.

Nicolle, in 1906, inoculated a monkey with leprous material and saw a characteristic nodule develop; a second inoculation caused a more rapidly-appearing and more lasting granuloma. Others have confirmed this basic experiment. Mariani, with an antiformin suspension of nodule, obtained a positive intradermic reaction of tuberculoid structure in an individual inoculated three months previously with virulent leprous material, a result which had not been obtained previously. But this is not strictly specific, because hypersensitiveness can be produced, for instance, with the Koch bacillus. However, it may help in the interpretation of certain phenomena of the disease, such as leptotic reactions which may be crises of hypersensitiveness representing intermediate degrees of the immunizing process. Allergy would explain the nodular erythema and reactions observed in nodular cases treated with chaulmoogra drugs, neo-salvarsan, iodine, X-rays, etc. These reactions are stages of a progressive aggravation of the disease, though a strong reaction indicates the formation of a condition of immunity to it, as in tuberculosis. By the intradermal injection of virulent leprous material Mariani, in two cases of anesthetic leprosy, obtained a tuberculoid lesion, without bacilli, which suggests an allergic nature for the tuberculoid lesions of leprosy.

Investigations on allergy in leprosy have given varied results. The author himself worked with twelve patients and concludes: 1, scarification gives negative results with specific antigens or nothing; 2, intradermal inoculation of nonspecific antigens (tuberculin, gonococcic vaccine) produced lively reactions in four wholly or predominantly anesthetic cases while none was produced in the other cases; 3, intradermal inoculation of specific (nodule) material always caused livelier reactions in predominant cases than the others; 4, the reactions vary with the quantity of antigen used. Studied from the viewpoint of the participation of the reticulo-endothelial system (pirrol blue), the skin reaction did not seem specific. The positive reaction with tuberculin could be attributed to tuberculosis, or to hyperergy of the cutaneous tissue in anesthetic leprosy to any stimulation,



with hypoergy or anergy in the nodular type, as in acute infections. Positive reactions having been obtained in both anesthetic and nodular leprosy with the nodular material, it would seem that there are no dermatropic and neurotropic stains of the bacillus.—[FROM TRANSLATION OF ABSTRACT IN *Rev. Leprol. S. Paulo* 1 (1934) 122.] \*

ANDERSON, H. H., FISHER, B. H. AND EMERSON, G. A. The acute toxicity of trypan blue and methylene blue. *Jour. Pharmacol. and Exper. Therap.* (Proc.) in press.

Dyes when used intravenously are all to some extent toxic. Widely different toxic ranges are encountered with different dyes, and considerable species variation generally exists also. Trypan blue was found to kill mice at 400 mgm./Kg. intraperitoneally, while 300 mgm./Kg. is tolerated; 3 of 5 mice die at 200 mgm./Kg. intravenously. Rats given trypan blue orally showed no effects and did not become blue at doses of 1.0 gm./Kg., indicating no absorption; subcutaneously it killed 4 of 5 rats at 400 mgm./Kg.; intraperitoneally at 350 mgm./Kg.; intravenously at 300 mgm./Kg.; Guinea pigs are slightly less resistant, fatal doses being 300 mgm./Kg. subcutaneously, and 250 mgm./Kg. intraperitoneally. Rabbits survive 300 mgm./Kg. intraperitoneally, but die at 400 mgm./Kg. Intravenously 100 mgm./Kg. kills 1 of 5 rabbits, 150 mgm./Kg. 3 of 5. Methylene blue is more toxic, since 3 of 5 rats succumb to 200 mgm./Kg. subcutaneously while 150 mgm./Kg. is tolerated; 6 of 10 die with 50 to 100 mgm./Kg. intraperitoneally. Intravenously, 40 mgm./Kg. is lethal to cats. Gentian violet and brilliant green are more than 10 times as toxic as methylene blue, and exhibit even more species variation. —[AUTHORS' ABSTRACT.]

LEAKE, C. D., ANDERSON, H. H. AND EMERSON, G. A. An improved laboratory method for evaluating drugs proposed for the treatment of leprosy. *Jour. Pharmacol. and Exper. Therap.* (Proc.) in press.

Certain minor changes have been made in the Anderson method (this JOURNAL), these affecting only the testing of therapeutic effectiveness in leprosy rats. Larger numbers of rats (200) are now inoculated at one time with the same lepromatous material; younger rats (100-150 Gm.) are used; treatment is instituted earlier (4 to 6 weeks after inoculation) since no spontaneous regressions have occurred among approximately 750 rats; more emphasis is placed on growth curves; drugs are administered in all cases in doses equivalent to one-fifth of a single m.l.d. each week for 5 to 10 weeks before a rest period is allowed; larger groups (36 to 48 rats) are given drugs found effective in smaller groups. Direct injection of drugs into the subcutaneous lepromata (equivalent to the intradermal injection in humans) has been abandoned. The superiority of complete pharmacological over simple bacteriological tests is pointed out, and the advantage of using leprosy animals rather than humans for experimental work is again emphasized. —[FROM AUTHORS' ABSTRACT.]

\* Translation from Portuguese by the Translating Division, Department of the Interior, Government of the Philippine Islands.

EMERSON, G. A., ANDERSON, H. H. AND LEAKE, C. D. Experimental evidence of the effectiveness of Na-dichaulmoogryl-B-glycerophosphate ("chaulphosphate") in leprosy. *Jour. Pharmacol. and Exper. Therap.* (Proc.) in press.

The theoretical advantages of systemic therapy with watersoluble chaulmoogrates are discussed. The uniform occurrence of sclerosis, hemolysis, hematuria and damage to renal tubules and liver has been the chief objection to intensive treatment with these agents, but chaulphosphate now appears to permit such treatment. It is more effective against experimental rat leprosy than any drug so far studied, including ethyl chaulmoograte and alepol. Observations over a period of 18 months include lower mortality, absence of sloughing lesions, regression of subcutaneous lesions, absence of metastatic progression, and improvement in weight and general appearance with chaulphosphate. Further pharmacological examination is desirable before clinical trial is made of chaulphosphate.

—[FROM AUTHORS' ABSTRACT.]

LEDENTU. Essais de nosographie au Gabon. [Nosography of Gabon.] *Ann. Méd. et Pharm. Colon.* 29 (1931) 431.

Holding that leprosy is common on the coast of Gabon, up to 4 per thousand in the region of Port Gentil, and more rare on the plateau of the interior, perhaps in keeping with the differences of humidity of these two areas.

—M. LEGER (TRANSLATED.)

LEDENTU. Les maladies transmissibles observées dans les colonies françaises en 1929. [Transmissible diseases in the French colonies in 1929.] *Ann. Méd. et Pharm. Colon.* 29 (1931) 661.

After giving a number of statistics the author indicates the status of the problem of the fight against leprosy in the French colonies. The old conception of the leprosarium-asylum is condemned nearly unanimously by medical men in favor of a mixed organization more in conformity with the modern spirit and scientific facts.

—M. LEGER (TRANSLATED.)

[FEDERATED MALAY STATES.] Annual report of the Institute for Medical Research, 1931 (Leprosy). A. Neave Kingsbury, Director. Kuala Lumpur. 1932.

Following the discussion of the Leonard Wood Memorial Conference in Manila on leprosy research, it was decided to attempt infection of vitamin-deficient rats. Kingsbury (evidently), with the collaboration of Dr. I. A. Simpson, put batches of six rats each on diets deficient in A, B and C, a control batch being given a well-balanced diet. Dr. G. A. Ryrie supplied material for inoculation, nodules excised from acutely reacting cases. These were ground in a mortar, emulsified in saline, and centrifuged at low speed to separate out the larger masses of tissue. The emulsion contained 80,000 bacilli per cc. Of each batch of rats, animals Nos. 1 and 2 were inoculated intracutaneously (left ear) with 0.1 cc. of this, after heating to 100°C. for one hour. Nos. 3, 4 and 5 of each batch were similarly inoculated with unheated emulsion, and a quantity of it was sprayed into the nostrils of No. 6. To determine the effect of repeated inoculations, six weeks later a second emulsion (containing 2,000,000 bacilli per cc.) was injected. Nos. 1 and 3 of each batch were inoculated with 0.1 cc. intradermally into the left ear, Nos. 2 and 4 similarly into the right

ear, and No. 6 was again subjected to intranasal spraying. As before, the emulsion given to Nos. 1 and 2 was heated.

The experiment still continues; the animals have long since shown vitamin deficiency and a few have died. Examination of the sites of inoculation has been negative except for occasional slight puckering and, in one or two instances, the apparent formation of minute nodules. In these cases histological examination has revealed some endothelial proliferation but, apart from one instance in which death occurred shortly after inoculation, no acid-fast bacilli were found in the ears or the organs. So far it appears that the vitamin-deficient batches are not less resistant to infection than are normal rats. —[FROM ABST. IN *Jour. Trop. Med. and Hyg.* 36 (1933) 73.]

[FEDERATED MALAY STATES.] Annual report of the Institute for Medical Research, 1932 (Leprosy). Dr. A. Neave Kingsbury, Director. Kuala Lumpur. 1933.

Further attempts to infect white rats are reported (evidently by Kingsbury). Though the results of work done in the previous year with Simpson were slight, certain observations led to repetition of the experiment. Fresh rats inoculated in June and sacrificed at the end of the year showed no evidence of infection. It was concluded vitamin deficiency apparently does not make rats less resistant to this organism. On the assumption that lepra reaction is not unconnected with the phenomenon of allergy, it was thought that desensitizing might abort or defer reactions. Protease extracts from urines of reacting cases were made and the one found to cause the most reaction in a patient by skin test was administered to him by intradermal injection. Improvement in four cases treated for the year is described; nothing is said about aborting or preventing reactions. The improvement is considered possibly due to "keeping the patient for long periods in a condition of mild reaction." The Wassermann and Kahn tests were compared on the sera of 594 cases. A higher percentage of positives was obtained with the latter (48.7 per cent) than with the former (41.4 per cent). —H. W. W.

CARRILLO, F., SCHUJMAN, S. AND FERNANDEZ, J. M. Ensayos del tratamiento de la lepra por los acidos grasos del aceite de Chaulmoogra al estado coloidal. [Experimental treatment of leprosy with chaulmoogra fatty acids in colloidal state.] *Rev. Argentina Dermatosisif.* 16 (1932), Special No., p. 557.

The authors experimented with intravenous therapy using a supposedly "optimum" concentration of fatty acids, a 5 per cent solution of the sodium salts diluted 100 times, each cc. containing 0.05 cgm. of the fatty acids. Injections were made daily, increasing from 1 cc. to the limit of tolerance, in some cases as much as 4 cc. The intramuscular route was painful. The first injections (intravenous) caused short colloidal reactions, but no accident was observed except sclerosis of the veins which sooner or later compelled suspension of treatment. From 7 to 27 doses were given the 11 cases treated, the average being 15. The benefit gained was considered satisfactory, and was proportionate to the amount of drug given. —H. W. W.

UCHIDA, M. On the vitamine A in gynocardic oil and fruit. *La Lepro* 3 (1932) No. 21. (In Japanese, with author's summary in English.)

The author found that rats given a standard avitaminosis ration died from 10 to 15 days sooner than those with whose food 2.5 per cent "gynocardic" oil and fruit was mixed. Animals injected 2 or 3 times a week with 0.1 cc. of the oil that had been heated for sterilization lived no longer than the controls, but those injected with unheated oil survived 11 days longer. He concludes that these materials contain a certain amount of vitamine A, but that since the amount that was given to demonstrate it is larger than can be used practically in treating leprosy this element would seem to have little influence on the effects of the drug in leprosy. —[ABSTRACT OF AUTHOR'S SUMMARY.—H. W. W.]

UCHIDA, M. A study of the diseases of the eyes in cases of rat leprosy. (I Report.)

Histological examination of the eyes of the leprous rat. *La Lepro* 3 (1932) No. 4. (In Japanese, with author's summary in English.)

In 277 leprous rats caught in the city of Kumomoto, the author found 56 (10 per cent) of the eyes affected. The commonest change was infiltration of the lids, by continuity from the surrounding region. The condition gradually encroached on the palpebral conjunctiva, extending under the orbicular conjunctiva to the limbus of the cornea, and also posteriorly around the eyeball to form a focus about the optic nerve. Moderate infiltrations were formed at the lachrymal gland. The eyeball was affected in only 7 instances, and only 6 eyes showed lesions of the cornea. When the cornea was affected there was a moderate infiltration under the limbus of the conjunctiva, but only a few lepra cells wandered into the crevices of the cornea, and no isolated bacilli were found invading along the lymph spaces as in human leprosy. In only one case was there true leprous infiltration, with bacilli, far from the limbus. There was a relatively intense new growth of blood vessels, and occasional bacilli were found here and also in the superficial layer of the limbus. Only in one case were a few lepra cells seen near the Schlemm's canal of the deep layer of the sclera. No leprous affections were found inside the eyeball.

Moderate falling of the hair was observed in one-third of the rats, not always associated with leprous infiltration of the subcutis. Eye changes were found in the majority of the animals in which bacilli were demonstrable in the subcutis and viscera. Compared with the eye changes in human leprosy they were slight; rats do not live long enough for them to become severe, and the bacilli seldom enter the blood stream. The changes are in the front half of the eyeball, rarely in the retina and optic nerve as in human leprosy. The first change was always subconjunctival, whereas in human leprosy it may be here or near the base of the ciliary body. It is concluded that the changes found occur only by continuity from the surrounding tissue, but that in human leprosy there is also infection of the eye from within.—[FROM AUTHOR'S SUMMARY.—H. W. W.]