

## CURRENT LITERATURE

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✓ **Languillon, J.** Les lésions cutanées dans la lèpre. Aspects cliniques. [The cutaneous lesions of leprosy. Clinical aspects.] *Méd. Trop.* **25** (1965) 573-576.

This paper describes the cutaneous lesions occurring in allergic leprosy (leprides) in anergic leprosy (lepromas) and in leprosy with decreasing allergy (lesions of reactional tuberculoid leprosy and borderline leprosy). The use of the Periaswamy method for the diagnosis of the latter two lesions is discussed.—J. LANGUILLON

✓ **Nudenberg, B.** Nuevo aporte acerca del valor pronóstico de la electroforesis en la forma incaracterística de la lepra. [New example of the prognostic value of electrophoresis in the indeterminate form of leprosy.] *Leprológia* **10** (1965) 38-39.

The author has stated that the hypergammaglobulinemia in cases of indeterminate leprosy could be an indication of prelepromatous character, for healthy persons, tuberculoid patients and indeterminate patients with a positive Mitsuda reaction have normal globulinemia. A case report is given.—E. D. L. JONQUIÈRES

✓ **Santos Silva, M.** [Nerve leprosy.] *Rovisco Pais* **4** (1965) 3. No. 14.

The author justifies his elaborate work by indicating the need for recognizing the neural symptoms of leprosy, whether the latter are due to purely neural lesions or to cutaneous changes of the same pathogenic origin. He explains the varying symptomatology in detail.—A. SALAZAR LEITE

✓ **Nguyễn, X. N., Phan, D. and Doan, T. H.** Les lésions oculaires de la lèpre. [Ocular lesions of leprosy.] *Vietnam Med.* (Hanoi) (1965) 93-98.

The authors give 5 illustrations and 4 tables arising from clinical study of many patients in Vietnam. They found that eye lesions occurred in nearly half of 1,444 patients with leprosy. The lesions were mostly trophic and paralytic; paralytic bilateral lesions occurred early in the disease and increased with the duration. Corneal lesions were not so frequent as those of the iris and ciliary body, which occurred late, after the 5th year. Corneal lesions and lesions of the iris and ciliary body were generally of insidious development and increased with the evolution of the disease. Sulfone therapy had a very favorable effect and seemed to stabilize the lesions provided that treatment had been regular. Eye lesions occurred predominantly in the lepromatous form of leprosy. (Abstract by J. R. Innes. *Trop. Dis. Bull.* **63** (1966) 765.)

✓ **Dexemple P. and Sansarricq, H.** Premiers résultats de l'auto traitement de la lèpre dans la région de Kaya (Haute-Volta). [First results of self-treatment of leprosy in the Kaya region (Upper Volta).] *Compt. rend. trimes. l'Inst. Marchoux* **7** (1966) 18-24.

In the course of the last two years an experiment on self-medication of leprosy has been conducted in the Kaya area, Upper Volta, on 1,398 leprosy patients, of whom 748 were followed up clinically during the first year. The first results seem to indicate that in the long run this mode of self-medication could yield results as good as those obtained with the usual method based on controlled drug administration.—J. LANGUILLON

✓ **Ellard, G. A.** Absorption, metabolism and excretion of di (*p*-aminophenyl) sulphone (dapsone) and di (*p*-aminophenyl) sulfoxide in man. *British J. Pharmacol. & Chemotherap.* **26** (1966) 212-217.

The excretion of di (*p*-aminophenyl) sulfone (dapsone), di (*p*-aminophenyl) sulfoxide, their acid-labile metabolites and other diazotizable compounds was measured in the urine of leprosy patients being treated orally with dapsone and the sulfoxide. About 41% of the dapsone given is excreted as the free compound plus acid-labile conjugates, and 27% as compounds which are hydrolyzed to dapsone-like substances by boiling with dilute acid. The absorption of the sulfoxide appears to be less complete than that of dapsone, only about 55% of the dose being excreted in the urine as diazotizable compounds compared with 75% for dapsone. Considerable oxidation of di (*p*-aminophenyl) sulfoxide to dapsone occurs in the human body and about a quarter of the free amines excreted in the urine after dosage with the sulfoxide are due to dapsone. These results are discussed in relation to the treatment of leprosy with these drugs.—AUTHOR'S SUMMARY

Shepard, C. C., McRae, D. H. and Habas, J. A. Sensitivity of *Mycobacterium leprae* to low levels of 4,4'-diaminodiphenyl sulfone. *Proc. Soc. Exper. Biol. & Med.* 122:3 (1966) 893-896.

In their summary the authors state: "The activity against *M. leprae* of 4,4'-diaminodiphenyl sulfone (DDS) was tested in mice by feeding a series of diets containing the drug in concentrations ranging from 0.03 to 0.00001%. Multiplication of *M. leprae* was completely suppressed at all levels. The lowest DDS intake was a hundred times less than the least amount required to produce chemically detectable amounts in the blood (0.2 to 0.3  $\mu\text{g}/\text{ml.}$ ).” Discussing their findings, they state that in the leprosy patient, many of the bacilli probably are multiplying only slowly, so that they would be less susceptible to DDS than bacilli under test in the mouse. This, coupled with the larger bacterial population (with increased possibility of the presence of resistant bacilli) prompt the statement that “. . . it would be expected that the level of DDS needed for effective human therapy is higher than that needed to suppress infection in the mouse.” The difference between DDS levels in human

tissues after the accepted therapeutic dose and the levels found in this study is about a thousand fold—"thus it seems indicated to test the therapeutic effect in human leprosy of lower dosages of DDS and less frequent administration." The results suggest that DDS might have an especially useful role in chemoprophylaxis.—J. A. ROBERTSEN

Ritschel, W. A. and Ritschel-Beurlin, G. Zur Hauttemperatur bei Lepra kranken. [Skin temperature in leprosy patients.] *Wien. Med. Wschr.* 115 (1965) 917-919.

Skin temperature measurements were carried out on 14 male patients (tuberculoid and lepromatous) in a leprosarium in East Pakistan. Measurements were made of the ventral aspect of the terminal phalanx of the fingers and toes and were repeated in the same patients after 4 and 8 weeks. The air temperature was 24-26°C. The results are reported as the maximal temperature difference observed between individual digits on the same extremity. Differences for the fingers ranged from 0.5 to 8.5° and were usually in the range 0.6 to 4.0°; the differences for the toes ranged from 0.4 to 4.8° and were also usually in the range 0.6 to 4.0°. Measurements were made also of the skin overlying leprosy nodules, and they were found to be 0.1 to 4.7° warmer than the surrounding area. It is said that during reactions there was increased difference in the temperature of the digits. No measurements of normal persons are reported.—C. C. SHEPARD

Gaind, M. L., Menor, C. V. and Ramakrishna. Therapeutic trial report on long-acting sulphonamide Ro 4-4393 (Fanasil) in the treatment of leprosy. *Leprosy Rev.* 37 (1966) 167-172.

Thirty-four patients, 17 lepromatous and 17 tuberculoid, were subjected to a therapeutic trial with a long-acting sulfonamide Ro 4-4393 (Fanasil, Roche) for a period of 22 months. Of the 17 lepromatous leprosy patients, ten showed excellent results; in three of these the improvement was spectacular. Two patients with lepra reaction and two patients with erythema nodosum type of reaction were encountered. Three other patients showed good results.

Of the 17 tuberculoid leprosy patients, 14 had had no treatment previously. Of these 14 patients, six showed good response, and five poor response in three months of treatment, whereas three patients previously treated with sulfones who had become static clinically, showed impressive improvement in two months after sulfonamide therapy. Skin eruption was encountered in two patients. However, in both it disappeared after interruption of treatment and did not recur on readministration of the drug. It was concluded that (1) Ro 4-4393 (Fanasil, Roche) has an indisputable activity in the treatment of leprosy. (2) The drug is well tolerated and easy to administer. (3) Leprea reactions are not frequent with this drug, but it is capable of producing lepra reaction or an erythema nodosum type of reaction in those who develop a similar reaction with other antileprosy drugs. (4) Two tablets (1 gm.) a week appear to be an adequate dose. [From authors' summary.]

✓ Wilkinson, F. F., Barclay, C. A., Gatti, J. C., Cardama, J. E., Balaña, L. M., Avila, J. J. and Perez Maldonado, C. Tratamiento de la lepra con Ro 4-4393, sulfamida de acción prolongada, a dosis única semanal. [Treatment of leprosy with Ro 4-4393, long-acting sulfonamide, in a weekly dose.] *Leprológia* 10 (1965) 69-75.

Thirty-three lepromatous and 4 tuberculoid leprosy patients were treated with weekly oral doses of Ro 4-4393. Eight patients were given 0.5 gm. per week; 15 were given 1 gm., and 13 took 1.5 gm. once a week. The treatment period varied from 6 months to 3 years. The results were as good as with the sulfones; therefore Ro 4-4393 is considered by the authors as a drug of election in the treatment of leprosy.—E. D. L. JONQUIÈRES

✓ Languillon, J. Le traitement de la lèpre par les sulfamides-retard. [Treatment of leprosy by long-acting sulfonamides.] *La semaine des Hôpitaux de Paris* 41e année, No. 53/8, 3131-3138.

The author reports the results of his experiments since 1951 using the long acting sulfonamides for the treatment of leprosy

in the Marchoux Institute (Bamako). Several drugs have been used, with various ways of administration. Three of them appear to be best, viz.: sulfamethoxypyridazine (0.75 gm. every other day), acetyl-sulfamethoxypyrazine (2.50 gm. weekly), Ro 4-4393 or sulfathomidine (1.50 gm. weekly). Advantages of these three drugs are as follows: good tolerance, effect on any type of leprosy, the fact that it is not necessary to suspend the administration during lepra reaction, and the possibility of using them for mass treatment.—J. LANGUILLON

✓ Carayon, A., Languillon, J. and Daney P. Sulfamides et névrite lépreuse. [Sulfonamides and leprosy neuritis.] *Bull. Soc. Méd. Afrique Noire Langue Française* 10 (1965) 560-652.

Although sulfones have practically no effect on neuritis associated with leprosy, the results presented in this study suggest that sulfonamides have brought about appreciable progress. Experimental work has been undertaken with the aim of explaining the mechanism of the sulfonamide effect. This might lead to the use of sulfonamides in the treatment of neuritis associated with leprosy.—J. LANGUILLON

✓ Languillon, J. and Carayon, A. La régression tuberculoïde dans la forme lépromateuse a propos de cinq observations. [Tuberculoid regression in the lepromatous form as seen in five observations.] *Afrique médicale* 39 (1966) 215-217.

Cases are reported of 5 lepromatous patients who underwent a tuberculoid regression after treatment by long-acting sulfonamides and Ciba 1906. By use of the immunologic classification of one of the authors, it was possible to classify these cases in the interpolar group.—J. LANGUILLON

✓ Languillon, J. and Gayraud, J. Traitement de la maladie de Hansen par un dérivé de la diphenyl-thiourée: 4 butoxy-4'-diméthyl-amino thiocarbanilide (Ciba 1906) administré par voie buccale et en suspension injectable. [Treatment of lep-

rosy with a derivative of diphenylthiourea: 4-butoxy-4'-dimethyl-amino thiocarbanilide (Ciba 1906) administered by mouth and in injectable suspension.] *Méd. Afrique Noire* 12 (1965) 423-426.

The clinical and bacteriologic activities of the sulfones and Ciba 1906 are similar. Reactions of the erythema nodosum type and neuritis, however, are less frequent with Ciba 1906. The course of these complications is more benign in patients treated with Ciba 1906 than in those treated with sulfones. Although a dosage of 3 mgm. orally per day of Ciba 1906 is well tolerated, weekly injections of 10 ml. of 20% suspension in oil are poorly tolerated during the second year of treatment. Although treatment with an injectable suspension is preferred, shift to oral therapy at the beginning of the second year of treatment is advised.—J. LANGUILLON

Barbosa, Americo. Tratamento de lepra com Ciba-1906 injectavel. [Treatment of leprosy with injectable Ciba 1906.] *Rovisco Pais* 4 (1965) 35-50. No. 13.

From results obtained the conclusion is reached that the practice of using injectable Ciba 1906 in the therapeutic antileprosy arsenal is not justified, because of local intolerance, which was found in almost 50% of cases treated, and also because the injectable drug was not found to be more active than the same drug given orally.—A. SALAZAR LEITE

Browne, S. G. B.663 (Geigy). Further observations on its suspected anti-inflammatory action. *Leprosy Rev.* 37 (1966) 141-145.

Ten adult patients, all suffering from lepromatous leprosy, who had developed persistent exacerbations for periods of from 16 to 36 weeks and had failed to respond to the usual drug regimen, were given B.663 in 100 mgm. doses daily. In four of these patients the dose was doubled after four months' treatment. A second group consisted of two patients whose skin smears had been negative for many months after years of treatment of lepromatous leprosy, in whom small succulent lesions containing innumerable viable *M. leprae* suddenly appeared. The author's summary states:

B.663 appeared to control persistent exacerbation in all ten patients, who were corticosteroid-dependent. A dose of 100 mgm. daily was sufficient in some patients, but 200 mgm. daily was necessary in others. Notwithstanding numerous unsuccessful attempts at weaning from corticosteroids previously, it was found possible in all ten patients gradually to reduce, and eventually to suppress, corticosteroids while continuing to give B.663. In two other patients B.663 was successful in ensuring both clinical and bacteriologic improvement.—N. D. FRASER

Alonso, A. M. Tratamento de lepra pela sulfametoxipiridazina. [Treatment of leprosy by sulfamethoxypyridazine.] *Bol. Serv. Nac. Lepra* 23 (1964) 54-61.

Kelfizine (sulfonamide sulfamethoxypyridazine) in a dose of 500 mgm. a day was tried in 25 leprosy patients, including 15 of lepromatous, 5 of tuberculoid, 3 of indeterminate, and 2 of dimorphous type. The drug was well tolerated. It did not cause anemia, leucopenia or hepatic upset. One patient only was unable to continue treatment, in his case because of an urticarial eruption at the beginning of treatment. Treatment to prevent side effects was unnecessary, in contrast with the case in sulfone therapy. Leprea reactions were observed in 47% of the patients, i.e., a lower figure than the 66% observed by the author with sulfones. In 47% of the patients the mucus became negative for bacilli in 8-24 months.—(From author's summary.)

Trimigliozzi, G. Sulphamethoxypyrazine in the treatment of leprosy. *Panminerva Med. (Turin)* 8 (1966) 76-79.

Sulfamethoxypyrazine exerts a definite antileprosy action and is no less effective than similar products, while being commendable for ease of administration. Its tolerability is equal to or greater than that of all other antileprosy drugs. Its wide clinical possibilities and frequent effect of resolving leprosy reactions are undoubted advantages, which obviate the need for long rest periods in therapy and reduce the need for systematic recourse to the dangerous cortisone.—(From author's summary.)



✓ **Sentilhe.** Quelques essais de traitement de la lèpre par l'Isoxyl. [Some attempts in the treatment of leprosy by Isoxyl.] *Compt. rend. trimes. l'Inst. Marchoux* 8 (1966) 3-17.

Therapeutic trials of leprosy have been conducted with 4-4'-diisoamyl-thiocarbani-  
lide (Isoxyl). In short term therapy results have generally been encouraging and similar to those reported by Buu-Hoi and Griffiths. Dosage was 2 gm. orally per day from the beginning, given in a single administration. These experiments have been conducted on leprosy patients affected with various types of leprosy and not previously treated. In the course of this short experiment, the clinical results have been considered as good. Improvement of the general condition and of the cutaneous lesions was particularly marked in lepromatous patients and in the so-called inter-polar cases, especially during the first 6 to 8 months of treatment. After the tenth month, improvement became slower. From the bacteriologic point of view, and within the limits of the short-term follow up, the results in bacteriologically positive patients seemed to be excellent. Significant modifications in the morphology and staining characteristics of the bacilli have been observed. No lepra reactions of the ENL type have been observed among the patients. A favorable effect has been noted on the nervous and trophic lesions in lepromatous patients, as well as in the so-called inter-polar patients with a trend to the lepromatous type. Therefore these results seem to be similar to the results obtained with Ciba 1906, another thiocarbani-  
lide. These experiments should be continued, using either one of two ways of treatment, i.e., (1) high dosage similar to the dosage used in the treatment of tuberculosis; and (2) in association with other drugs active against leprosy. It is therefore advisable to carry on investigation to define suitable dosage for using this drug in mass treatment or as a long-acting preparation.—J. LANGUILLON

✓ **Barbosa, Almeida and Ferreira, N.** [Treatment of leprosy with Madribon.] *Rovisco Pais* 4 (1965) 69-. No. 14.

Experiments with a small number of pa-

tients indicated that Madribon (2,4 dimethoxy-6-sulfanilamide-1, 3, diazine) has a leprostatic action, counteracting nasal mucus more effectively than DDS. Its action on lepromatous patients resistant to sulfone treatment is doubtful. Its use seems on the whole preferable to the classic first year treatment.—A. SALAZAR LETTE

✓ **Faraj, G., Matera, R. and Linares, C.** Evolución de las úlceras leprosas tratadas con 7-(2-hidroxi-3-(N-2-hidroxi-etil-N-metilamino-propil)-1,3-dimetilxantina nicotinato). [The evolution of leprosy ulcers treated with 7-(2-hydroxy-3-(N-2-hydroxy-ethyl-N methylamino-propyl)-1,3-dimethyl-xanthine nicotinate).] *Leprológia* 10 (1965) 57-61.

This product, called Complamina in Argentina, has a fibrinolytic action and activates collateral circulation. Good improvement was noted in its use in some cases of leprosy trophic ulcers.—E. D. L. JONQUIÈRES

✓ **Pereira, L. C.** Lisoizima no tratamento de doentes de lepra em manifestação aguda. [Lysozyme in the treatment of leprosy patients with acute manifestations.] *Publ. Centro Estudos Leprol. (Parana)* 5 (1965) 71-80.

In a group of patients suffering from leprosy (7 with lepromatous reactions, and one with tuberculoid reaction) use was made of Fleming lysozyme (Lisoizima, Laboratil) in the treatment of reactions. Results were excellent in acute and superacute forms, when the enzyme was associated with cortisone. Only one patient could not continue with the experiment in view of his poor state of health, and it was necessary to have him sent to the leprosarium. It was noted that the remedy is effective in painful syndromes, in high fevers and in skin syndromes. It helps by strengthening the cortisone, when it is associated with it, with the advantage of allowing a low dose of the hormone, with a reduction of the side effects of the latter. In the superacute forms, slightly responsive to the current therapy, the use of these two medicines together is indicated. The observations lasted an average of 120 days; the daily dose was 150 mgm. given intramuscularly and orally. In the author's

opinion lysozyme is innocuous to the human organism. It would be ideal to use the medicine orally because of the ease of application.—AUTHOR'S SUMMARY

✓ **Languillon, J.** Le traitement de la réaction lépreuse. [The treatment of lepra reaction.] *Afrique médicale* 39 (1966) 223-224.

The treatment of erythema nodosum leprosum is based on: (1) Suspension of the specific sulfone therapy; (2) administration of emetic tartrate and corticoids if necessary. When the reaction has been controlled, the sulfone treatment may be resumed gradually. The reactional neuritis of the cubital nerve should be treated by debridement of the osteoligamentous canal, followed by a fascicular endoneurolysis.—J. LANGUILLON

✓ **Harter, P.** L'erythema nodosum leprosum de Murata. *Revue de la littérature. Etude de 185 cas.* [Erythema nodosum leprosum of Murata. Review of the literature. Study of 185 cases.] *Bull. soc. Path. exot.* 58 (1965) 335-400.

This 65 page article, with a bibliography of 218 references and 17 figures, gives an extended review of the history of erythema nodosum, its clinical, pathologic, bacteriologic, and immunologic characteristics, its relation with different types of leprosy, and its prognosis and treatment. The defining elements of the disease as set forth by Mosuke Murata, who gave the syndrome its name in 1912, are outlined, and there is abundant citation of significant subsequent work. The account includes references to 185 cases (183 of which were lepromatous and 2 borderline). The author notes that the great variety of characteristics of the disease makes it difficult to comprise them under a single term, but in spite of numerous suggestions for different designations, the term applied by Murata, although not uniformly appropriate, still seems the most suitable. As a rule the disease is seen only during periods of involution of leprosy lesions. In only 9.8% of the observations noted was their accompanying exacerbation. The prevailing concepts of pathogenesis, including

septicemia and allergic manifestations, are reviewed. Attention is paid to the characteristic vascular, and especially capillary changes that occur in ENL. Emphasis is placed on the irreversible accentuation of nerve and ocular lesions and resistance to antileprosy treatment. Further critical studies of corticotherapy are desirable.—E. R. LONG

✓ **de Castro, I. and de Castro, N.** Nota sobre a toxicidade da DDS. [Note on the toxicity of DDS.] *Bol. Serv. Nac. Lepra* 23 (1964) 17-20.

The authors describe a clinical case of cyanosis resulting from intake of Promin (disubstitution product of DDS), and call attention to the isotrophic effect of DDS and benzedrine, in an effort to explain the symptoms. In their opinion activity is due to the aromatic-amino groups, and they point out differences in the action of DDS and Promin.—AUTHORS' SUMMARY.

✓ **Costa Pinto, F.** Intoxicação aguda por sulfonas relato de um caso clínico. Considerações sobre a etiopatogenia, fisiopatologia e tratamento de metahemoglobinemia e sulfohemoglobinemia. [Acute intoxication by sulfones; report of a clinical case. Considerations on the etiopathogenesis, physiopathology and treatment of methemoglobinemia and sulfohemoglobinemia.] *Bol. Serv. Nac. Lepra* 23 (1964) 25-38.

A case of acute sulfone intoxication is reported. Anoxemia provoked by high levels of meta- and sulfohemoglobin was the cause of clinical symptoms. The author notes that several different compounds are concerned in the etiopathogenesis and physiopathology of the intoxication.—(From author's summary)

✓ **Languillon, J., Carayon, A. and Giraudeau, P.** Quatorze névrites réactionnelles hyperalgiques du cubital chez les lépromateux. [Fourteen cases of reactional hyperalgesic neuritis of the cubital nerve in lepromatous patients.] *Afrique médicale* 39 (1966) 214-221.

In 90% of the cases it is possible to cure reactional neuritis by the following meas-

ures: (1) Suspending sulfone treatment; (2) injecting hydrocortisone or hyaluronidase focally once the sulfone treatment has been suspended, combining these injections with general treatment with corticoids. (This is generally followed by a marked improvement, but relapses often do occur); (3) simple surgical decompression of the hypertrophied nerve (debridement of the osteo-ligamentous canals and perineurolysis). This is generally sufficient if the nerve deficit is partial. If this deficit is important and of long duration, it is necessary to proceed to a fascicular neurolysis.—J. LANGUILLON

**Languillon, J., Giraudeau, P. and Bourrel, P.** Le traitement des maux perforants plantaires dans la lèpre. [Treatment of perforating plantar ulcers in leprosy.] *Afrique médicale* 39 (1966) 225-226.

Three types of plantar ulcer may be defined by radiography: (1) perforating ulcer without bone lesions and paralytic deformities; (2) perforating ulcer with bone lesions or paralytic deformities in the foot; (3) recurring perforating ulcer. Medical treatment is based on: immobilization in a plaster cast and administration of a vasodilator. Surgical treatment is based on excision, corrective surgery, and neurolysis of the tibialis posterior and plantar nerves.—J. LANGUILLON

**Harris, J. R. and Brand, P. W.** Patterns of disintegration of the tarsus in the anesthetic foot. *J. Bone & Joint Surg. (Brit.)* 48 (1966) 4-16.

The authors find two distinct processes of destruction of the anesthetic foot. The first is a low erosion and shortening associated with perforating ulcers under the distal end of the foot; the second is a proximal disintegration of the tarsus in which mechanical forces determine onset and progress. Once the tarsus begins to disintegrate, it is difficult to halt the rapid destruction of the foot. It is possible to detect early stages in time to take preventive measures. Routine palpation will reveal patches of warmth localized to bones and joints that are in a condition of strain. Radiographs, posture, and gait may define early changes that point to possible patterns of dis-

integration. These patterns are described and discussed and suggestions made for preventive and corrective measures. The latter include recommendations for special footwear and surgical intervention.—J. A. ROBERTSEN

**Antia, N. H.** A tactile testing comb. *Lancet* 2 (1966) 594. (Correspondence)

In a letter Dr. Antia recommends the use of a comb with teeth 2 mm. apart to facilitate the examination for cutaneous sensory loss. The removal of teeth of the comb at requisite intervals provides a series of 2-point pressures graded in millimeters. "The cheapness, simplicity and speed of the device justifies its recommendation to those who use the test frequently, as in hand surgery or leprosy."—N. D. FRASER

**Carayon, A., Colomar, R. and Courbil, J. L.** Composante actuelle et lymphatique de la névrite hypertrophique hansénienne. [Arterial and lymphatic component of leprotic hypertrophic neuritis.] *Bull. Soc. Méd. Afrique Noire Langue Française* 10 (1965) 651-650.

This paper reports again on studies on the neural artery, using lymphographic and arteriographic methods. These two angiographic methods have thrown some light on the mechanism of edema of the trunk above and below a constriction in the hemolymphatic stream. Arteriography gives evidence of an arterial block in the vessel and lack of early venous return. Lymphography shows an extravasation in the newly formed lymphatic spaces. The resulting edema is due to an excess of pressure above the block and not to an effect of stasis below it. From this study it is concluded that early surgical procedure might relieve the arterial block and interrupt the pathologic process.—J. LANGUILLON

**Lennox, W. M.** Management of lagophthalmos in leprosy. *Leprosy Rev.* 37 (1966) 151-157.

The author reviews the development of lagophthalmos in leprosy patients and lays stress on the necessity for early recognition and treatment "The combination of lagophthalmos with corneal anesthesia is particu-

larly dangerous, and requires urgent treatment." After dealing with the management of acute and subtotal paralysis, he describes in detail the operation of temporalis musculofascial sling, as devised by Gillies, and recommends it as the procedure of choice in the majority of cases. Details of 37 operations on 24 patients performed by six surgeons at seven hospitals are presented. The results were considered as good or excellent in 30 eyes and as fair or poor in seven. The author's summary is as follows: A successful temporalis transfer gives support to the paralyzed lower lid, and repositions the puncta for draining tears. It provides voluntary power for closing the orbital fissure, and promotes reversal of exposure changes in the eye. It substitutes for the blink reflex, since the eyelids move with every contraction of the temporalis muscle, and resume their wiping and lubrication actions. Effective protection is afforded to the cornea rendered insensitive by leprosy. The cosmetic effect is pleasing; the risks of blindness are minimized. The operation carries a satisfactory success rate in the hands of nonspecialized surgeons, provided the technic and postoperative regimen are carefully followed.—N. D. FRASER

Clezy, J. K. A. A surgical programme in leprosy in Papua-New Guinea. *Leprosy Rev.* 37 (1966) 159-161.

The author describes the introduction of a surgical service for leprosy patients in the highlands of Papua and New Guinea. The estimated incidence of leprosy in a population of two million is 0.77%, of whom one-fifth are lepromatous. Rugged mountain country makes it difficult for patients to travel long distances in search of treatment. The three prerequisites for taking surgery to the patient are good communications, supplied by a commercial and mission air network, an acceptable minimum standard of operating and nursing facilities, and good physiotherapy. The cooperation of the Leprosy Mission and missions already engaged in leprosy work was secured in upgrading operating and nursing facilities, and a qualified physiotherapist who had had experience with leprosy work in India undertook the train-

ing of mission nurses who were already engaged in leprosy work. The author concludes: "We regard surgery as an essential part of any well-rounded leprosy program, rather than a luxury."—N. D. FRASER

Regis, P. Occupational therapy in leprosy with particular reference to activities of daily living. *Leprosy in India* 37 (1965) 466-474.

It is concluded that methods of occupational therapy can help patients without deformity as well as those with various stages of deformity. In patients without deformity the purpose is to teach use of hands and feet in such a way as to prevent deformities by protecting against injury, burns, etc. In patients with various degrees of deformity the purpose is to rectify or reduce the deformities, and enable the patients to utilize even the deformed limbs. The occupational therapist can help them (1) in pre- and postoperative treatment of operated hands, (2) in providing aids to daily activities of life, and (3) in earning a livelihood. General principles of activities directed to these ends are described, and some specific recommendations are made.—AUTHOR'S SUMMARY

Tokina, A. P. [Medical gymnastics in orthopedic deformities of leprotic origin.] *Voprosy Kurort. Fizioter.* 30 (1965) 501-505.

During four years 103 leprosy patients who suffered from orthopedic deformities were treated according to the method worked out by the author, and at the same time according to general antileprosy therapy. Most of them had deformities of long standing (up to about 34 years). Sixty-one had contractures of fingers, flat-feet, and in-turned toes. Nineteen patients had drop feet. Five patients had a fibrous ankylosis of the middle phalanx of the fingers, two of them with contracture of the hand toward the elbow, and one of them with flat-foot. Fifteen patients had various orthopedic deformities that started not long ago, e.g., bad mobility, restriction of motion, etc. The cycle of treatment consisted of ten baths at a temperature of 37-38°C. lasting 15-30 minutes, ten paraffin applications at a temperature of 50°, 20



massages, and medical gymnastics. The heat treatment was carried out every day, alternating with baths and applications. In 31 patients out of 35 with deformities that had just started, complete elimination of the deformities was brought about, with great improvement in the patients' health; in four patients moderate improvement occurred. Four patients out of 68 with stable orthopedic deformities either recovered completely or made considerable improvement; 22 improved moderately and six remained without any changes.—N. TORSUEV

**Ivanova, N. A.** [On localization of leprosy mycobacteria in different tissues of regressive skin lesions.] Actual problems of pathogenesis and therapy of skin and venereal diseases. Part I, Moscow, 1965, pp. 232-241.

In regressive lesions, foci of lepromatous type, including the stage of remnant manifestations in the peripheral blood vessels, are characterized by greater bacillary content than other tissues. In the majority of cases, when other tissues are completely free from bacilli, leprosy bacilli are found electively only in blood vessels of remnant skin lesion foci. Leprosy bacilli are brought by way of the blood stream from internal organs to the periphery (where active lesions exist longer), making regressive skin foci richer in bacilli and in a number of cases leading to the appearance of new eruptions observed during activation and relapse. The existence of new perivascular infiltrations possessing minutely vacuolated leprosy cells, together with old regressive foci, and the presence of leprosy bacilli in the skin artery sheaths, show instability of clinical regression. Both in tuberculoid and nondifferentiated types of leprosy in regressive foci mycobacteria are located mainly in the nerves, and seldom in the smooth skin muscles. The elective blood vessel localization was observed in some patients with activation of disease.—N. TORSUEV

**Job, C. K., Karat, A. B. A. and Karat, S.** The histological appearance of leprosy rhinitis and pathogenesis of septal perforation in leprosy. *J. Laryng. & Otol.* 80 (1966) 718-732.

The histopathologic appearance of lepromatous lesions in the nose is described. In tuberculoid and borderline cases there is infiltration of the nasal mucosa with lymphocytes, epithelioid cells and giant cells, but no obvious destruction of the nasal cartilage or bone. In lepromatous leprosy the septal cartilage is surrounded by vascular granulation tissue which may promote the absorption of cartilage cells, but the chief cause of the destruction of the cartilaginous septum is the gradual invasion of the cartilage by lepromatous granulation tissue. In addition there is atrophy of the nasal mucosal lining followed by ulceration. The ulcers invariably are secondarily infected. The acute inflammatory granulation tissue, which is formed subsequently, may invade the nasal cartilage and destroy it. Part or whole of the nasal septum and the tissue around it are replaced by fibrous tissue. The nose, which has lost its main support, is subject to the pull of the contracting fibrous tissue as well. A retracted, collapsed and deformed nose is the end result.—AUTHORS'

#### SUMMARY

**Seabra Santos, H.** *Mycobacterium leprae* em foliculos pilosos. [*Mycobacterium leprae* in hair follicles.] *Rovisco Pais* 4 (1965) 3-10. No. 15.

The author studied 70 biopsy specimens from lepromatous skin lesions with respect to the presence of *M. leprae* in hair follicles. Leprosy bacilli were seen also in hair root sheaths removed with forceps. Attention is called to the importance of leprosy bacilli in hair follicles not only with respect to local atrophy, but also with respect to transmission of the disease.—A. SALAZAR LEITE

**Povey, M. S. and Horton, R. J.** Leprosy and blood groups. *Leprosy Rev.* 37 (1966) 147-150.

The authors note that Hsuen, Thomas and Jesudin in 1963 described work suggesting an increased incidence of leprosy in persons of blood group O and a decreased incidence in persons of blood group B, when they were compared with controls. The population studied by the authors were leprosy patients at the Schief-

felin Leprosy Research Sanatorium, Kari-giri, India, about ten miles away. Since the finding of such a difference between patients and controls was suggestive of genetic factors operating in leprosy, it was decided that a repetition of this work should be included in a general study of leprosy and genetics carried out in the same area in 1964. One thousand and eighty-five patients were examined between June and August 1964. The author's summary of their findings, which are clearly set out in 8 tables, is as follows: (1) No evidence of a correlation between leprosy and ABO blood groups, transferrins or haptoglobins was found. (2) A high percentage of haptoglobin-negatives were found in the population studied. (3) No association was found between particular blood groups and types of leprosy. (4) The apparent association of leprosy with blood group O found by Hsuen *et al.* in 1963 may have been due to difference in area of origin and age between the leprosy patients and the blood donors.—N. D. FRASER

✓ Wilkinon, F. F., Gatti, J. C., Cardama, J. E., Gago, J. and Santabaya, E. Estudio bacteriológico de orina de enfermos de lepra y de contactos. [Bacteriologic study of the urine in leprosy patients and in contacts.] *Leprológia* 10 (1965) 34-37.

In none of 100 samples of urine of leprosy patients and contacts were acid-fast bacilli found. The authors conclude that the urine is not a source of contamination by *M. leprae*, as other authors have claimed.—E. D. L. JONQUIÈRES

✓ Waisman, R., Gimenez, M. M. and Risso, H. Bacilos ácido-alcohol resistentes en orina de enfermos de lepra. [Acid-fast bacilli in the urine of leprosy patients.] *Leprológia* 10 (1965) 17-21.

Approximately 57% of patients with active lepromatous leprosy, and positive smears in the skin, eliminated acid-fast bacilli by the urinary tract. No quantitative relation was found between skin and urinary smears for bacilli. The morphology of acid-fast bacilli in the urine was the same as that of *M. leprae* in cutaneous smears. In 18 healthy people working as leprosy assistants no urinary acid-fast bacilli were

found. The importance of this fact in the epidemiology of leprosy is stressed.—E. D. L. JONQUIÈRES

✓ Bergel, M. Leprosy and nutrition. *Leprosy Rev.* 37 (1966) 163-166.

From experiments with the diet of the experimental animal it appears that diets provoking vitamin E deficiency and pro-oxidant diets given at an early stage promote the development and growth of *M. leprae* in the animals. It is suggested that the dynamics of antileprosy therapy could be partly explained on the basis of its relationship with nutritional factors.—AUTHOR'S SUMMARY

✓ Waters, M. F. R. and Niven, J. S. F. Experimental infection of the ear and foot pad of the golden hamster with *Mycobacterium leprae*. *British J. Exper. Path.* 47 (1966) 86-92.

The authors confirm their success in obtaining limited local multiplication of *M. leprae* in hamsters. Although the inoculum was smaller in this series of animals ( $10^4$  bacilli), the final yield was the same as before ( $10^6$ ), this level being reached in 4½-8½ months. The results were the same in foot pads as in ears. (Abstract by D. S. Ridley. *Trop. Dis. Bull.* 63 (1966) 854.)

✓ Nakamura, M. and Mitsufuji, Y. [Intra-joint inoculation of *Mycobacterium leprae* and *lepraemurium* to the mouse.] *La Lepro* 34 (1965) 279-284. (In Japanese, English summary)

The fate of *M. leprae* and *M. lepraemurium* followed by the mouse-joint inoculation, which had not been attempted before, was observed and the results obtained demonstrated that *M. lepraemurium* developed well in the foot-joint cavity. The location of the bacillus multiplication was the joint-sack, not joint fluid. No effects from adding mucin, crystal violet, and trypan blue to the bacillary suspension for stimulating the development of the bacilli were observed. In the case of *M. leprae* experiments, there were no increases of the bacilli in this part, when observed by direct smear preparations. However, further experiments are needed for determination

of the increases of the bacilli, because, in this experiment, the number of bacilli in the materials was not calculated mathematically.—(From authors' summary.)

Ito, T., Kohsaka, K., Kamei, M. and Nishimura, S. [Studies on the intracerebral inoculation of *Mycobacterium leprae* in the suckling mouse.] *La Lepro* 34 (1965) 289-293. (In Japanese, English summary)

Bacterial suspensions prepared from a leproma. were inoculated intracerebrally into suckling mice which were killed and examined 6-12 months later. An increase in the number of bacilli was noted in 14 of 78 mice inoculated with a live suspension, but an increase was seen also in mice inoculated with a killed suspension and bacilli were found in the brains of control uninoculated animals. It was concluded that contamination with murine acid-fast bacilli had occurred and that there was no evidence that *M. leprae* could be grown in the brains of suckling mice. (Abstract by F. I. C. Apted. *Trop. Dis. Bull.* 63 (1966) 658.)

Miranda, R. N. and Bergel, M. Estudio comparativo de la inoculación del *Mycobacterium leprae* en pata y testículo de roedores alimentados con dieta pro-oxidante. [Comparative study of the inoculation of *M. leprae* in the foot pads and in the testicles of rodents fed on a pro-oxidizing diet.] *Publ. Centro Estudios Leprol.* (Parana) 5 (1965) 65-70.

The authors report a comparative study of the development of inoculated *M. leprae* in the hind foot pads and in the testicles of mice and rats fed on pro-oxidizing diets, coming to the conclusion that the foot pad is the most appropriate place for this type of experiment and for the development of the aforesaid germ.—AUTHORS' SUMMARY

Nishimura, S., Kohsaka, K., Mori, T., Kishi, Y. and Yamaguchi, M. [Murine leprosy-like acid-fast bacillus present in the gibel (Crucian carp, *Cyprinus auratus*) and goldfish.] *La Lepro* 34 (1965) 300-304. (In Japanese, English summary)

From a carp and 3 goldfish acid-fast ba-

cilli similar to the murine leprosy bacillus were isolated; they proliferated vigorously in mice, with the production of lepromata. From other carp and goldfish acid-fast bacilli that were not pathogenic were isolated. (Abstract by F. I. C. Apted. *Trop. Dis. Bull.* 63 (1966) 660.)

Mori, T., Kohsaka, K., Kishi, Y., Kamei, M. and Nishimura, S. Distribution of acid-fast bacilli in the skin, extremities and internal organs of various experimental animals. *La Lepro* 35 (1966) 27-32. (In Japanese, English summary)

Detailed observation of the distribution of acid-fast bacilli in various parts of the healthy mouse is important as a measure for learning the route of invasion of the organism in the animal. From findings in numerous investigations it may become possible to clarify the mechanism of infection of the murine leprosy bacillus under natural conditions. The distribution of acid-fast bacilli following administration of DDS and INH and bacillary distribution in animals other than the mouse were examined. The bacilli were collected by Dharmendra's method, using chloroform and ether. The skin was depilated and washed and the organs were cleansed to eliminate bacteria that might be adhering to the surface. A bacterial count was made by the formula

$$x = \frac{\text{No. of organisms per loop} \times \frac{\text{quantity of bacterial suspension}}{\text{quantity per loop (0.002 ml.)}}}{\text{No. of samples}}$$

Specimens were prepared by smearing one loopful of bacterial suspension on a glass slide, covering it with phenol-gelatin-water, and staining it with Ziehl-Neelsen stain. Many bacilli were present in the skin and foot pad of the mouse and in the organs, especially in those opening to the exterior. There was no pronounced difference according to the site of the skin. No difference in bacterial count was found between the 6-months-DDS and INH-treated mice and untreated controls. Acid-fast bacilli were isolated from the foot pad of the guinea-pig, the rabbit and the cat, and from a cutaneous nerve in the monkey.—(From authors' summary.)

✓ Sushida, K., Hirano, N. and Nakano, H. Mycobacterium isolated from mice inoculated into the testis with human leprosy material. First report. *La Lepro* 35 (1966) 15-20. (In Japanese, English summary)

Numerous attempts have been made to transmit human leprosy to rabbits by intratesticular inoculation. The authors found that the epididymis was often intensely attacked when atypical mycobacteria were inoculated into the testicle of rabbits. It was thought, therefore, that inoculation with human leprosy material into the epididymis of rabbits might serve as a suitable method for the inoculation. The investigation was carried out to ascertain if rabbits were susceptible to human leprosy when inoculated in the epididymis. Repeated tests showed that rabbits are not susceptible to human leprosy after the third generation. At the same time the same material was inoculated in the testicle and epididymis of mice. Human leprosy material (LL2) was injected into the testis. One of 10 mice lived for one year and more, but 14 months after the inoculation this mouse died showing marked evidence of infection; in direct smears and sections of liver, spleen and lung abundant acid-fast bacilli and globi were found. The acid-fast bacilli were transmitted from mouse to mouse, but all cultures proved sterile. It was inferred that the lesion might be mouse leprosy. There is convincing evidence of an immunologic relationship between *M. leprae* and *M. tuberculosis*. Old Tuberculin, Mitsuda antigen, LL2, and murine leprosy (Hawaii) antigen, were injected at two sites intracutaneously in two parallel rows along the backs of guinea-pigs sensitized with the tubercle bacillus. The animals were then observed for 4 weeks, and the skin reactions for each group averaged. From the results it was inferred that LL2 in mice and murine leprosy are identical.—From authors' summary.)

✓ Sushida, K., Hirano, N., Nakano, H. and Yayoshi, M. Mycobacterium isolated from mice inoculated into the testis with human leprosy material. Second report.

*La Lepro* 35 (1966) 21-26. (In Japanese, English summary)

A second report (see previous abstract) noted that LL2 was difficult to differentiate morphologically from murine leprosy (Hawaii) and that the pattern of the skin test in guinea-pigs sensitized with an attenuated tubercle bacillus showed that the antigen of LL2 in mice and antigen of the murine leprosy (Hawaii) are identical. These two patterns are different from that with the Mitsuda antigen. But the antigen pattern of LL2 and antigen pattern of murine leprosy (Hawaii) were different in gel diffusion tests. Therefore, it is believed that LL2 and murine leprosy (Hawaii) represent different strains.—(From authors' summary.)

✓ Languillon, J. *Le Mycobacterium leprae*. [*Mycobacterium leprae*.] *Méd. Trop.* 25 (1965) 1-9.

In this paper studies are reported on *M. leprae* with respect to classification, morphology, appearance of the bacillus under the electron microscope, cultures, experiments on transmission in man, and experimental transmission in animals. It deals also with methods for looking for the bacillus in man, for its staining in histologic specimens, and for differential diagnosis from other acid-fast bacilli, using Sudan black, and for its relationship with *M. lepraemurium*.—J. LANGUILLON

✓ Nishimura, S., Mori, T., Kohsaka, K. Kishi, Y. and Innami, S. [Studies on acid-fast bacillus detected in nonleprosy human skin tissues.] *La Lepro* 34 (1965) 358-364. (In Japanese, English summary)

After the finding of noncultivable acid-fast bacilli in the apparently healthy skin of normal symptomless mice, guinea-pigs, rabbits and monkeys, the authors sought for similar organisms in healthy human skin. Specimens were obtained from patients without leprosy, as a result of surgical operation or autopsy, and examined for mycobacteria by a concentration method in which acetic acid, chloroform and ether were used. Acid-fast bacilli were detected in 80 out of 105 specimens. They were abundant in 9% of the positive specimens, and in one instance 5 million organisms



were recovered from 5 gm. of tissue. Attempts to culture them were unsuccessful. An antigen prepared from isolated bacilli did not give a reaction in patients with leprosy who reacted to lepromin. The carriers of the bacilli were lepromin-negative. These findings cast doubt on the assumption that acid-fast bacilli detected in the contacts of patients with leprosy are leprosy bacilli. The patients from whom the unidentified bacilli were isolated were not thought to have been in contact with others who had leprosy. (Abstract by D. S. Ridley. *Trop. Dis. Bull.* 63 (1966) 851.)

✓ Nakamura, M. [Biological properties of *Mycobacterium lepraemurium*. VII. Effect of chemical treatments on the infectivity of *M. lepraemurium*.] *La Lepro* 34 (1965) 273-278. (In Japanese, English summary)

This paper reports fundamental data on the effects of chemical treatments on the infectivity of *M. lepraemurium* in order to contribute toward experimental attempts at cultivation of *M. leprae*, which is, at present, an obligate intracellular parasite. *Phenol*: the infectivity of the bacilli was completely destroyed within 30 minutes by treatment with more than 5% phenol. *NaCl*: hypertonic salt solution, especially 7% NaCl, destroyed the infectivity of the bacilli in 3 days at 37°C. *SDOC and urea*: protein-denaturing agents, such as sodium deoxycholate (SDOC) and urea, had no inactivating effect on the infectivity of *M. lepraemurium*, under the conditions of treatment in a concentration of 0.01% to 1.0% for 60 to 120 min. at 37°C. *Organic solvents*: among the organic solvents used, chloroform, ether, toluene and butanol had inactivating effect, but petroleum ether had no destructive effect on the infectivity of the bacilli. *Dye*: crystal violet solution in a concentration of 0.1% inactivated the infectivity within 24 hours at 37°C; however, it seemed that a solution of 0.00001% crystal violet enhanced the pathogenicity of the bacilli for mice.—AUTHOR'S SUMMARY

✓ Ghosh, S. and Bose, R. Sensitization to lepromin induced experimentally with a vole bacillus vaccine. *Indian J. Med. Res.* 53 (1965) 1025-1026.

Ten guinea-pigs which were lepromin-negative and tuberculin-negative when first tested, became lepromin-positive after vaccination with the vole bacillus. The tuberculin test remained negative. Four unvaccinated control guinea-pigs remained lepromin-negative at the second test. (Abstract by D. S. Ridley. *Trop. Dis. Bull.* 63 (1966) 550.)

✓ Dharmendra, Mohamed Ali, P., Noordeen, S. K. and Ramanujam, K. Prophylactic value of DDS against leprosy. An interim report. *Leprosy in India* 37 (1965) 447-467.

The prophylactic value of DDS among intrafamilial child contacts exposed to lepromatous and bacterio-positive nonlepromatous cases is being investigated at the Central Leprosy Teaching and Research Institute, Chingleput, India, which is situated in the midst of a large belt of high endemicity of leprosy. A preliminary house to house survey was made in an area adjoining the Institute, covering a total population of over 213,000. A prevalence rate of 21/1,000, and a lepromatous rate of a little over 14% were found. The total number of "source" cases was 362, including 330 lepromatous cases and 32 bacterio-positive nonlepromatous cases. A little over 700 healthy intrafamilial child contacts (below 15 years of age) of these were recorded. The healthy child contacts were divided into two comparable groups—the "prophylaxis" and the "control" groups. The prophylaxis group has been receiving DDS in scheduled doses, and the control group similar looking placebo tablets. The study has been conducted by double-blind method. All the source cases have also been treated with therapeutic doses of DDS. The study as of August 1965 has been in progress 2¼ years, during which all the contacts of both the groups have been periodically and regularly examined. During the course of study there had been certain deletions and additions in the number of contacts. The number of healthy contacts at the start of the study was 689. Of these, 585 (291 belonging to the prophylaxis group, and 294 to the control group) had been treated for the full

period of observation. The present report is based on an analysis of the findings in these 585 contacts. During the period of observation, 43 cases of leprosy have been recorded in the 585 contacts. Of these cases, 14 have been in the 291 contacts in the prophylaxis group, giving an incidence of 4.81%; and 29 in the 294 contacts in the control group, giving an incidence of 9.86%. This difference is found to be statistically significant at the 2% level. It is therefore tentatively concluded that, under the conditions of the present investigations, administration of DDS to healthy child contacts of leprosy patients has been found to have a protective value against the disease. The protective value is, however, apparent only after 9 months of the prophylactic treatment; during the first 9 months, there was no difference between the prophylaxis and the control groups in the incidence of the disease. Further, there appears to be a relationship between the protective value of DDS and the age of the contact at which the prophylaxis treatment is first started. In the study under report, the prophylactic treatment was found to be of definite value in the contacts up to 10 years of age, but it had no such value in contacts above that age. This would emphasize the need for starting prophylaxis treatment soon after exposure to infection; in intrafamilial contacts it would mean starting the treatment at as early an age as possible. There is some evidence to suggest that in the contacts developing the disease, the prognosis may be better in those under DDS prophylaxis, than in others. DDS prophylaxis was also found to be more effective among males. The reason for this observed difference is not clear, and no inference can be drawn from this particular finding. It is proposed to continue the present study for a little longer, and then to analyze the findings from the various aspects before coming to a final conclusion. Once the effectiveness of prophylactic treatment with DDS is finally established, further studies will have to be planned to get information on various practical points regarding its general application in the control of the disease, and regarding other related matters. Some of these have been briefly discussed.—AUTHORS' SUMMARY

[Editorial] Chemoprophylaxis in leprosy. *British Med. J.* 1 (1966) 1252.

This editorial summarizes the report of Dharmendra and his co-workers in Chingleput on a large scale trial of the prophylactic value of dapsone against leprosy in child contacts (Dharmendra, Mohamed Ali, P., Noordeen, S. K. and Ramanujam, K. Prophylactic value of DDS against leprosy. An interim report. *Leprosy in India* 37 (1966) 447-467) and the report of J. A. K. Brown and M. M. Stone showing that BCG vaccination gave 80% protection against the development of leprosy in child contacts in a large scale trial carried out in Uganda (BCG vaccination of children against leprosy: first results of a trial in Uganda. *British Med. J.* 1 (1966) 7-14). "The two trials together provide the first positive evidence that preventive measures can be expected to contribute significantly to the final successful control of leprosy. It is tempting even at such a preliminary stage to compare the results of the two trials. There are many similarities, since both deal with child contacts in whom dapsone or BCG reduced the incidence of early, nonlepromatous leprosy. The most significant and probably the most important difference from the practical point of view is that BCG vaccination appears to be more likely than chemoprophylaxis to prevent the development of overt leprosy in children already incubating the disease. Thus chemoprophylaxis failed to prevent the development of leprosy during the first nine months of treatment or the development of leprosy in children over the age of 10 years. On the other hand BCG protected children equally at all ages up to 16 years and between 1 and 3 years after vaccination. This somewhat unexpected result is in a line with recent experimental work, which shows an almost complete suppression of multiplication of leprosy bacilli in the foot pads of BCG-vaccinated mice whether vaccinated before or during the active phase of the infection. Chemoprophylaxis for the control of tuberculosis, particularly for mass application in developing countries, has proved impracticable and uneconomical, and the best prophylactic measure remains BCG vaccination. Therefore it is important to conduct further

studies of dapsone prophylaxis in leprosy to determine particularly the frequency, dosage needed and minimum period of treatment.—N. D. FRASER

Hauvillier, O. A. and Oviedo, C. L. Los adyuvantes en inmunología. Su aplicación en lepra. [The adjuvants in immunology. Their application in leprosy.] *Temas de Leprología* (Buenos Aires) 13 (1966) 1-8.

Freund established the fact, in 1937, that the addition of paraffin oil to a bacterial vaccine increases the allergic state created by the vaccine. The immunization was again increased if mineral oil and an emulsion of dead tubercle bacilli or other acid-fast bacteria were added to the antigens under study. Many other oils and methods were studied by other investigators, among them Virgilio Etcheverry, who tried to induce some immunity in paroled lepromatous patients with an emulsion of dead tubercle bacilli in a cetyl alcohol emulsion, or with the lipoids of tubercle bacilli. Other oily substances were tried by Salk, including Arlacel A, Bayol, and Dakreol, in experiments directed toward increasing the formation of antibodies to other antigens, such as C.C.A. (chicken cell agglutination). The coadjuvants seem to offer a promising method for inducing a long antigenic stimulation. They must be assayed in trying to increase immunity against *M. leprae*.—E. D. L. JONQUIÈRES

Margni, R. A., Hauvillier, O. A., Acerbo, E. O., Gutierrez de Duvey, O., Bobbi, C., Cordal de Bobbi, E. and Casavola, H. Immunoelectroforesis del suero de leproso. [Immunoelectrophoresis of leprosy sera.] *Leprología* 10 (1965) 11-13.

In patients with tuberculoid leprosy, and in contacts, the results were normal. In 20 per cent of lepromatous patients some anomalies were noted, including increase of gamma globulin and gamma 1 M globulin, and in one case increase of gamma SS globulin.—E. D. L. JONQUIÈRES

Maeda, M. and Nakamura, K. Immunogenicity of Mitsuda antigen in guinea-pigs. *La Lepro* 34 (1965) 321-327. (In Japanese, English summary)

It has been reported that when Dharmendra antigen produced by chemical treatment of lepromin was injected intracutaneously into healthy guinea-pigs 8 times at an interval of two weeks, the size of reaction was less than 5 mm. and the injection produced no immunity. Accordingly, an investigation was made of the effect of frequent injection of Mitsuda antigen without chemical treatment. In animals in which Mitsuda antigen was injected intracutaneously 6 times at intervals of 2 or 4 weeks, the size of reaction caused by the antigen increased from 4 mm. to 15 mm., and the dimensions of the tuberculin reaction and the reaction due to Dharmendra antigen as examined in the 8th and 14th weeks increased as in the results of the reaction caused by Mitsuda antigen. Consequently it can be stated that the intracutaneous reaction caused by Mitsuda antigen produces immunity against leprosy and tuberculosis. For investigation of the cause of these phenomenon, therefore, a comparison was made of the reaction in animals sensitized by heat-killed BCG suspension with human cutaneous tissue and that in animals sensitized by heat-killed BCG suspension only. The size of reaction due to Dharmendra antigen or tuberculin reaction in the former animals was larger than that in the latter animals. This proves that the tissue and its component act as adjuvants. Apparently, however, the injection of Mitsuda antigen into human beings should be carried out with attention to the fact that intracutaneous injection of human cutaneous tissue makes animals allergic. Moreover, the size of the intracutaneous reaction in animals sensitized by heat-killed BCG suspension with Mitsuda antigen is larger than that in animals sensitized by either Mitsuda antigen alone or heat-killed BCG with tissue suspension. A mixture of Mitsuda antigen and heat-killed BCG suspension, is therefore, considered to be effective for the prevention of leprosy.—(From authors' summary.)

Hokiwara, H. The effect of the Toyoda vaccine on leprosy. *La Lepro* 34 (1965) 328-334. (In Japanese, English summary)

The effect of Toyoda vaccine, a chloro-

form extract of BCG in combination with other agents, was examined. This vaccine has been reported to be effective in tuberculous lymphadenitis of the cervical nodes and pulmonary tuberculosis. It has been tried in leprosy, without undesirable side effects. A permanent effect has been noted in many cases of ENL and progressive lepra reaction, and it has become possible to administer other forms of antileprosy agents by this means in some cases, while clinical improvement has been noted in several difficult-to-treat cases.—(From author's summary.)

✓ Maeda, M., Abe, M., Hijioka, H., Kobayashi, S., Hokiwaru, H. and Ishiwaua, S. Effect of repeated injection of Mitsuda antigen upon its reactivity in human body. *La Lepro* 34 (1965) 335-340. (In Japanese, English summary)

It has been reported that repeated injection of Mitsuda antigen produced accelerated reactivity, as seen in the tuberculin reaction. However, Mitsuda antigen may have immunogenicity, because it contains tissue components in addition to bacillary body. The immunogenicity of Mitsuda antigen has already been reported in animal examination. Accordingly, this phenomenon was investigated in leprosy patients. Reactions caused by Mitsuda antigen and tissue suspension were compared between patients subjected to the reaction by Dharmendra antigen. The sizes of reactions caused by both antigens proved larger in the former patients than in the latter. This fact shows that Mitsuda antigen has immunogenicity and particularly that the skin tissue contained in this antigen is related with this immunity. Therefore, when Mitsuda antigen is used for intracutaneous examination in the human body, unless this immunogenicity is taken into consideration as shown by the results of animal experiment, there may be danger of erroneously reading the modified reaction as against Mitsuda antigen.—(From authors' summary.)

✓ Abe, M., Maeda, M., Nakayama, T., Hijioka, H., Kobayashi, S. and Nokibara, H. Studies on the preparation, standardization and preservation of lepromin. VI.

Effect of the removal of tissue components in lepromin. *La Lepro* 34 (1965) 341-347. (In Japanese, English summary)

In order to prepare standard lepromin from material with low bacterial content, it has been necessary to remove the majority of tissue components from lepromin without influencing its potency. This problem was solved by the following experiment. Pooled nodules from relapsed patients were divided into two parts, one of which was used for preparation of the standard lepromin (Ms) by the usual method, while the other was treated with a mixture of trypsin and bile salts so that the majority of tissue components were digested, and the partially purified bacillus suspension (Mp) was prepared by centrifugation and washing. In spite of such treatment, no increased morphologic change of bacilli in Mp was observed, as compared with that of Ms, as seen by microscopic as well as electron microscopic examinations. In comparative tests with leprosy patients, the size of early reaction with Mp in nonlepromatous cases was larger than that of Ms, but the late reactions did not show any significant difference between Mp and Ms. On the other hand, the late reactions with Mp in lepromatous cases showed a gradual decrease from 15 days to 42 days after injection, while no marked change in the period was observed in the case of Ms. This difference was considered to be caused by the sensitization due to tissue components in Ms, and not to be caused by lowered potency of Mp due to the purification procedures.—(From authors' summary.)

✓ Maeda, M., Abe, M., Asami, N., Murohashi, T., Takai, R. and Shiozawa, K. Relationship between *M. leprae* and BCG on the skin reaction. II. Results obtained in human examination. *La Lepro* 35 (1966) 1-7. (In Japanese, English summary)

The relationship between reaction to Dharmendra's antigen and the tuberculin reaction was investigated in several towns and villages. Dharmendra's antigen was injected in the skin of one forearm while tuberculin was tested on the other forearm. The causes influencing positive rates



in both reactions were analyzed, and the relationship between reactions to Dharmendra's antigen and tuberculin in tuberculosis patients was compared with reactions in BCG-vaccinated persons. The positive rate to Dharmendra's antigen in tuberculin-positive reactors among BCG-vaccinated peoples was about twice the rate among tuberculosis patients. These results show that positive conversion of the reaction to Dharmendra's antigen is influenced first by BCG vaccination and secondarily by the infection with tuberculosis, but not influenced so much by the prevalence of leprosy. The difference in the relationship between reactions to Dharmendra's antigen and tuberculin found in some towns and villages could be due to the BCG vaccination more than to the infection with tuberculosis. These results showed that *M. leprae* contained larger amount of antigen in common with BCG than with *M. tuberculosis hominis*. Therefore, prophylactic significance of BCG against leprosy is to be considered.—(From authors' summary.)

Hauvillier, O. A. Alergia bacteriana en lepra. [Bacterial allergy in leprosy.] *Leprologia* 10 (1965) 30-33.

The hypersensitivity of leprosy patients to common bacteria introduced by the intradermal route, was tested for both polar types, and in the active and the arrested state. The results were the same as in healthy persons. Paroled lepromatous patients with high erythrocyte sedimentation rates must be suspected of suffering from associated infections. Selective antibiotics and vaccines must be employed.—E. D. L. JONQUIÈRES

Mohamed Ali, P. and Prasad, K. V. N. Contact surveys in leprosy. *Leprosy Rev.* 37 (1966) 173-182.

This paper reviews the progress made by the Division of Epidemiology and Statistics in the Central Leprosy Teaching and Research Institute, Chingleput, S. India, since the first survey, the results of which were published in 1963. The population studied was comprised of 4,383 patients and 14,776 contacts; the required information was collected by 20 paramedical

workers who had received training at Chingleput. Detailed information is set out clearly in eight tables. The authors' summary and conclusions are as follows: (1) Of all types of leprosy, the lepromatous type has the highest attack rate and is hence more infectious. (2) When the bacterial index is considered, it is not only the lepromatous-positive type; N?L-positive patients also are equally capable of infecting the contacts (3) When the bacterial index is negative, in all the three types, lepromatous, intermediate and nonlepromatous, the rate of infection is the same, and it is less than that of the positive cases. (4) Within the positive lepromatous group (although it is not quite clear because of insufficient data), it appears that the attack rate increases with the value of the bacterial index. (5) The attack rate in the case of two source families is statistically significant (it is almost double) when compared to the single source family. (6) In the two-patient families, the attack rate is highest when the source combination is lepromatous and nonlepromatous, and it is statistically significant when compared to the attack rate when both sources are of nonlepromatous type. (7) In the case of males, the attack rate decreases with the age; in the case of females the attack rate is lowest in the age group 15-44. (8) The difference in the overall attack rates in the case of males and females is statistically significant. (9) The attack rate is least among the female contacts having females as source cases. (10) The attack rate among male contacts having males as sources is higher compared to the attack rate among female contacts with males or females as source cases. (11) Age-specific attack rates are studied in respect to different type of source patients. The attack rate takes the maximum and minimum values at particular age levels and the variation so observed is rather systematic. No comments are offered on this peculiar phenomenon at present but the matter is being further studied.—N. D. FRASER

Contreras, D. F. Organización de campañas antileprosas. [Organization of antileprosy campaigns.] *Rev. Leprol. (Fontilles)* 6 (1965) 327-343.

Reference is made to campaigns suitable for countries with endemics of leprosy of minor intensity, a subject covered in courses in leprology conducted by the Sanatorio de Fontilles in addition to the types of procedure in countries in which the disease is highly endemic. The objectives of the campaigns are analyzed with primary emphasis on early diagnosis in initial stages, and treatment, which should be considered as obligatory, and which preferentially should be ambulatory. The circumstances indicating the need for sanatorium treatment are noted, but it is emphasized that admission for sanatorium treatment should be voluntary. In view of the fact that many years commonly elapse before a case of leprosy is recognized as such, and the fact that when early forms are recognized they are easily cured without the development of scars, deformities and dystrophies, it is important to organize meticulous case-finding campaigns directed toward contacts, and especially toward children and youths among them. Trial of BCG vaccination may continue as in tuberculosis, provided personnel is available and primary emphasis remains on early diagnosis and adequate treatment. The author believes that BCG leads to conversion in the Mitsuda reaction, but has doubts first as to persistence of the conversion, second as to the true significance of the conversion, since in form the reactions are not always typically tuberculoid, and third, and most important, because although among the vaccinated tuberculoid forms predominate, still some lepromatous types develop, and up to date no one can furnish assurance that the vaccination protects against leprosy. Above all else, personnel dedicated to the campaign against leprosy in regions of small endemics, should make certain that their principal mission is finding, recognizing, distinguishing and diagnosing, as soon as possible, all early forms of leprosy, in prescribing abortive treatment, and in a continuing rigid vigilance greater continuity than in the case of any other disease, recognizing the fact that the disease in chronic form will require long, and follow-up for all treated cases, with

continuous and persistent treatment.—F. CONTRERAS

Santos Silva, M. Epidemiologia e profilaxia da lepra. [Epidemiology and prophylaxis of leprosy.] *Rovisco Pais* 4 (1965) 3-32. No. 13.

After a definition of the endemicity of leprosy and notation that elements giving proof of it as an infectious-contagious disease have been taken away from it, some rapid considerations on the etiopathogenesis are made, and the multiple intervening factors of its diffusion are mentioned. Reported also are the principal methods for estimating the seriousness, extent, distribution, and other characteristics of endemic leprosy. The value of some rates, especially the incidence and prevalence ones, is emphasized. Stressed, too, are basic considerations on prophylaxis. Former and present methods, are noted, including those adopted and followed after the advent of sulfone therapy, and demonstration of the prophylactic possibilities of BCG. Some obstacles and limitations to the present therapy of leprosy are described, with emphasis on diagnosis and treatment in advance. Not only trained leprologists but other physicians not specializing in leprosy should play an active role in leprosy work.—(From author's summary.)

Warren, G. Hay Ling Chau provides care of Hong Kong leprosy patients. *Internat. Surg. Bull.* 45 (1966) 3-9.

Hay Ling Chau, an island situated about 9 miles from the center of Hong Kong, which was selected for a leprosarium for the leprosy patients in Hong Kong and renamed so, has living accommodations for 500 leprosy patients and a hospital which provides 65 beds. At the end of 1965 there were 477 patients. Various surgical procedures for leprosy disorders in the face, hands and feet were made 250 times in all in 1965. Some 100-120 patients leave Hay Ling Chau each year and return to Hong Kong.—K. KITAMURA

Magalhães Basto, P. and de Melo Teixeira, H. Brigada-ensaio na freguesia de Carnide (Pombal). Experimental team in

the District of Carnido (Pombal). *Rovisco Pais* 4 (1965) 11-16. No. 15.

The authors stress the value of explorative survey operations by polyvalent teams. The use of such teams avoids specification of the disease leprosy, and the stigma commonly attached to it, and thus is superior to the use of specialized teams. The polyvalent system permits a broader contact with the population, and therefore furnishes a better knowledge of hygienic standards of living and better circumstances of active health education.—A. SALAZAR LETTE

✓ **Yakovlevskaya, L. I.** [The fifteen-year experience of combating leprosy in the Kemerovskaya district.] *Transactions of the Second Conference of Dermatologists and Venereologists in Kuzbass, Novokuznetsk, U.S.S.R.* (1966) 445-448.

During the last 15 years 6 leprosy patients were registered, 4 of them of the lepromatous type. At present 37 patients that were in close and prolonged contact with them are under periodic medical observation.—N. TORSUEV

✓ **Kharabadjakhov, K. K.** [Participation of dermato-venereologists in the campaign against leprosy on the Don.] *Reports at the Third United Scientific Conference of Medical and Scientific Research Institutes of Rostov on the Don.* May 1966, pp. 274-276. (Part 1)

Of 267 leprosy patients registered in the Rostov region up to the beginning of 1966, many are out of the hospital and live at home. Fifty-eight of them are treated as outpatients in the dispensary, and 110 have entirely completed their treatment and are now under dispensary observation. Every year the percentage of patients discovered by nonspecialists in leprology, i.e., physicians in other specialties, increases; from 1950 until 1954 they discovered 35% of the patients; from 1955 until 1959, 55%; and from 1960 until 1963, 67%. New cases of leprosy in the Rostov region have now become very rare.—N. TORSUEV

✓ **Takahashi, Y.** Psychologic studies of leprosy patients. *La Lepre* 34 (1965) 348-357. (In Japanese, English summary)

Psychologic investigations conducted in the Aisei-en National Leprosarium resulted as follows: Questionnaires sent to 300 patients showed (1) that leprosy patients reveal psychologic trouble connected with the course of the disease, (2) that they are tired by various conflicts in the actual life in the sanatorium, and (3) through long life in the sanatorium, their minds and bodies are closely related and interact on each other and mental hygiene is needed. Interviews with 72 patients showed that there are usually three stages through which patients go after being diagnosed as leprosy patients; viz., (1) a period of mental blow; the time of diagnosis is usually an extremely trying period filled with anxiety and emotion; (2) at this stage their feelings are under a cover, so to speak, this being a defense mechanism; and (3) a struggle with emptiness in their lives and consequent despair.—(From author's summary.)

✓ **Buker, R. S.** Leprosy control methods. *J. American Med. Assoc.* 193 (1965) 643-645.

Conclusions, reached on the basis of analysis of published reports and the author's experience in Burma and Thailand, are as follows: The three methods used in the control of leprosy are the colony, the treatment clinic with survey and education, and the leprosy village, which is the least known. Colonies have failed because of expense and the refusal of many persons with leprosy to be isolated from normal life. Clinics are of value in reducing the number of cripples and patients with advanced stages of the disease. However, because of the expense of having adequately trained paramedical workers, and the inability to persuade more than 50% of the patients to take medication for more than 5 years, the clinics do not control leprosy. The leprosy village is the most economic, for the patients are self-supporting, and are willing to remain isolated. Once established, the village remains permanent. The study of villages of more than 20 years' duration shows no contact cases except in children of patients who lived before the era of DDS. The author is convinced, after 35 years of experience with

all methods of control, that, if the village is accepted as the method of control, leprosy can be eradicated from any area.—(From author's summary.)

- ✓ **Brusco, C. M.** Grandeza y decadencia de los leprosarios. [Glory and decline of leprosaria.] *Leprología* 10 (1965) 40-44.

Leprosaria are still useful, although they are expensive. Much is said and written against them. However it must be presumed that in Argentina the internment of about 5,000 leprosy patients in leprosaria has prevented the disease in about 13,000 persons in the last 24 years.—E. D. L. JONQUIÈRES

- ✓ **Brusco, C. M.** Trabajos científicos en leprología. Algunas reflexiones. [Scientific papers in leprology. Some reflections.] *Leprología* 10 (1965) 52-54.

Important reflections and recommendations are made on the need of a program of planning for work to be done in verifying a hypothesis. Some common mistakes in the interpretation of results are cited. The value of good statistical data is stressed. Graphs must be short, explanatory and clearly drawn.—E. D. L. JONQUIÈRES

- Kharabadjakhov, K. K.** [The problem of consultative assistance for leprosy patients.] Reports at the Third United Sci-

entific Conference of Medical and Scientific Research Institutes of Rostov on the Don. May 1966, pp. 277-279. (Part 1)

There are 25 patients in the Rostov experimental-clinical hospital for leprosy patients. The hospital is located on the medical clinical territory and makes great use of the consultation of different specialists. From 1961 till 1965, inclusive, the patients had the benefit of 808 consultations.—N. TORSUEV

- Anonymous.** Victor George Heiser. *Trop. Med. & Hyg. News* 15 (1966) 17-19.

In this brief biographic note, the contributions of this illustrious public health officer and tropical disease specialist are recounted. Despite his 93 years, he still walks 2-4 miles a day and participates in every session of the New York Society of Tropical Medicine. Dr. Heiser's diaries from 1898 to 1955 have been donated to the American Philosophical Society in Philadelphia and his personal papers, books, photographs and memorabilia have been donated to the Tropical Disease Research Center in New York. These collections have been described as a "veritable treasure trove" of material related to tropical disease and preventive medicine.—J. A. ROBERTSEN