

## CURRENT LITERATURE

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## Clinical Course

✓ **Camain, R.** Composantes des lésions nerveuses hanseniennes. [Composition of leprosy nerve lesions.] Bull. Soc. Med. Afrique Noire (Langue franc.) 13 (1968) 98-115.

As in the case of any microbial infection, two factors are concerned in the development of nerve lesions in leprosy, viz., the bacillus and the reactivity of the tissues of the body. Tissue reactions are much more concerned than the intensity of bacillary multiplication in the development of lesions. These in turn are conditioned by the anergic, allergic or hyperergic state of the patient, manifested by vascular modification, cellular reaction, necrosis, and sclerosis. Leprotic lesions progress from simple compression of nerve fibers to total destruction, being sometimes reversible and at other times not.—J. LANGUILLON

W **Goodwin, C. S. and Watson, J. M.** Neuritis and paralysis in leprosy. Physiotherapy 54 (1968) 327-332.

The role of peripheral nerve damage, stressed in the preceding papers of this series, is reviewed, with an outline of significant factors in diagnosis of the basic neuritis and its treatment. Detailed measures for assessment of nerve function for the guidance of treatment are noted in a summarizing table (muscle test card) and a diagram indicating the application of stimuli for the detection of sensory change. Similarly, reproduced record cards and diagrams illustrate procedures in the diagnosis and treatment of paralysis following damage to the motor fibers of the peripheral nerves. The account takes note of (1) tendency to adaptive shortening of skin

and other soft tissues, (2) alteration of weight-bearing surfaces, (3) loss of muscle padding, (4) loss of muscle support, and (5) weakening from disuse. The authors conclude by emphasizing the part that physiotherapy can play in reversing damaging processes or keeping them to a minimum, and in preventing secondary deformity. In their view "stiff, clawed, damaged hands and feet of leprosy patients, and blindness, should soon be things of the past."—E. R. LONG

W **Usmanov, R. K.** [Vestibular chronaxy in leprosy patients.] Voprosy Leprol. i Dermat. 21 (1968) 22-23.

The author investigated rheobase chronaxy in the vestibular apparatus of 100 healthy persons and 100 lepromatous patients. The investigations were carried out with an impulse stimulator of election type (ISE-01). The average indices of the rheobase and vestibular chronaxy in leprosy patients were twice lower than those in healthy persons. The data obtained testify to an increased excitability of the vestibular apparatus due to the specific influence of the leprosy process upon the labyrinth.—  
AUTHOR'S SUMMARY

W **Merklen, F.-P., Cottenot, F. and Egger, L.** Reprises et aggravation d'une lèpre tuberculoïde à la suite d'arrêts thérapeutiques répétés. [Recurrence and aggravation in a case of tuberculoid leprosy following repeated therapeutic arrests.] Bull. Soc. Franc. Dermat. et Syphilig. 75 (1968) 188-189.

Case report. In contrast to the rule in lepromatous leprosy, in which treatment is

life-long, the tendency in tuberculoid forms is to limit treatment to two or three years after clearing of lesions. The authors, however, have observed a number of relapses in tuberculoid leprosy several years after arrest through treatment. A case is described confirming not only the possibility of relapse, but of reappearance of the disease in clinically more severe, near-borderline form. Histologic examination showed some of the features of each type.—E. R. LONG

**Kharabadzkhov, K. K. and Torsueva, N. N.** [Some problems in dispensary treatment of leprosy patients.] *Voprosy Leprol. i Dermat.* **21** (1968) 125-127.

A special and properly documented system of active dispensary treatment of patients has been created at the Rostov-on-Don experimental and clinical hospital for leprosy patients. The efficacy of the system is confirmed by a relative decrease in the number of disease relapses.—AUTHORS' SUMMARY

**Ramu, G. and Balakrishnan, S.** Arthritis in lepromatous leprosy. Clinical features and biochemical findings. *Leprosy in India* **40** (1968) 62-69.

A study of 18 cases of recurrent attacks of arthritis in lepromatous leprosy is presented. Arthritis in lepromatous leprosy is a distinctive clinical entity. Beginning in the acute state of lepra reaction with features resembling acute rheumatic fever, in the recurrent states it simulates rheumatoid arthritis in its clinical and biochemical features. An inverse relationship between joint manifestations and skin lesions, the one or the other being predominant at one time, is noteworthy. Serum levels of sialic acid and mucoproteins are markedly elevated in patients with lepromatous leprosy in reactive states with or without arthritis. The increase in these constituents is well correlated with elevated ESR values and consistent positivity of CRP tests. Increases in these constituents suggest a possible rise in the connective tissue elements particularly during exacerbation.—AUTHORS' SUMMARY

**Leschenko, A. I.** [The content of 17-oxy-corticosteroids in the urine of patients suffering from lepromatous type of leprosy.] *Voprosy Leprol. i Dermat.* **21** (1968) 51-54.

Twenty-five patients with lepromatous leprosy were examined. They had the average normal content of 17-corticosteroids in their daily urine. The tendency to the normalization of function of the adrenal cortex is preserved in patients with considerable regression of the leprosy process.—(From author's summary)

**Torsuev, N. A. and Loginov, V. K.** [On the classification of leprosy.] *Voprosy Leprol. i Dermat.* **21** (1968) 15-21.

The authors offer a new scheme for the classification of leprosy, in which one can distinguish two basic (polar) types, viz., tuberculoid and lepromatous, and two other groups, "indefinite" and dimorphous. Three subgroups are marked out in every group: (1) cutaneous, (2) cutaneous-nervous, and (3) nervous.—N. TORSUEV

**Cochrane, R. G.** Biological therapy of leprosy. *Dermat. Internat.* **6** (1967) 243-245.

Biologic therapy is discussed in this paper in terms of natural defenses of the host tissues to the invasion of *M. leprae*. It is suggested that the body can defend itself against *M. leprae* by three methods: (1) the process of natural immunity; this immune process in all probability lies within the cell; (2) the capacity to develop an acute tuberculin type of hypersensitivity, and thus contain the bacillus within the tissues and prevent its spreading throughout the reticuloendothelial system; (3) by the strength of the lysosomal activity that is stimulated; diaminodiphenyl sulfone potentiates this cellular enzyme and, therefore, the cell itself is capable of dealing with the *M. leprae*. It is surmised that if the lysosomal activity is not potentiated or is only temporarily enhanced, either the patient will not recover or a relapse will take place after a period, which varies in each case. If the immune mechanism in leprosy rests, in large part, in the macrophage cells (including the Schwann cells),

this would explain why humoral immunity, as shown by the presence of circulating antibodies, is an ineffective method of defense against the *M. leprae*.—(From author's summary)

**Bogush, T. G.** [Generative function of females who are ill with lepromatous leprosy,] *Voprosy Leprol. i Dermat.* **21** (1968) 29-32.

Treatment by sulfone preparations, if started during the first two years of illness, in many cases prevents disturbances of generative function in females who are ill with lepromatous leprosy. Females who have not been treated at all, or have been treated by ineffective preparations, for the most part, appear to be sterile.—AUTHOR'S SUMMARY

**Bogush, T. G.** [Gynecologic diseases in leprosy patients.] *Voprosy Leprol. i Dermat.* **21** (1968) 24-28.

Inflammatory diseases of female sex organs are rarely met in leprosy patients and even then progress in attenuated form. Benign tumors of the uterus and its appendages are also rare. Operative procedures in treatment of gynecologic disorders do not change the course of leprosy for the worse. In leprosy patients resistance to purulent infections is increased.—AUTHOR'S SUMMARY

**Carayon, A., Languillon, J. and Foucher, G.** Gynecomastie du lépreux et obstacle au flux lymphatique spermatique. [Gynecomastia in leprosy and obstruction to sperm flow.] *Bull. Soc. Med. Afrique Noire (Langue franc.)* **12** (1967) 552-558.

Histology and hormonal investigations have not determined a definite mechanism to account for the testicular deficiency in leprosy, when gonadotropin and testosterone treatment fails. In 2 cases spermatic lymphography has indicated stasis and reflux induced by a pelvic or prevertebral obstruction; this furnishes a new explanation—deep adenitis—and suggests early

treatment by corticoids, together with other antileprosy therapy.—J. LANGUILLON

**Bogaert Diaz, H.** La lepra en los niños. Conceptos modernos. [Leprosy in children. Modern concepts.] *Rev. Dominicana Dermat.* **2** (1968) 24-35.

Leprosy is a disease that is relatively frequent in the Dominican Republic. The actual number of cases is believed to be between 4,000 and 5,000. It predominates in the National District and San Pedro de Macoris. The two polar types and intermediate forms are described. Emphasis is placed on the differential diagnosis with many of the diseases of the skin that appear in children. Ambulatory treatment is practiced, curing the patients either spontaneously or with DDS. Not more than 50 mgm. daily of DDS is administered. The patients should be treated like any other sick person and not be admitted to a leprosarium.—(From author's summary)

**Aplas, V.** Ist die Lepra heilbar? [Is leprosy curable?] *Dermat. Internat.* **6** (1967) 236-242.

With the present chemotherapy of leprosy it is possible to bring about a regression of the leprotic pathologic process, but not to destroy the etiologic agents of the disease proliferating in the body. The human organism is not able wholly to eliminate it by means of its humoral and cellular defenses in view of certain special biologic attributes of the organism, such as its intra- and extracellular parasitism, the slight local reaction to it as a foreign body, and especially its capacity to digest human macrophages. The body remains infected for life, and correspondingly infective for its environment. This concept is of basic and far-reaching significance for the eradication of leprosy. The leprosy problem cannot be solved by time alone. Measures for the abolition of the possibility of contagion today must still be considered decisive in the campaign against leprosy.—(From author's summary)

**Leiker, D. L. and Ziedses Des Plantes, M.** Granuloma multiforme in Kenya. *East African Med. J.* **44** (1967) 429-436.

Granuloma multiforme is a skin condition that may be confused with tuberculoid leprosy. It has been described in Eastern and Northern Nigeria, and now the authors report a large number of cases from Kenya. Many of the patients were found attending leprosy centers; the condition was not confined to any one tribe or area. Granuloma multiforme starts with itching, and after some weeks or months papulo-nodular lesions develop and enlarge to form plaques. These then develop into circinate lesions with a well-defined outer edge. Lesions are usually on the upper part of the

body. Children are not affected. After some years the lesions flatten and disappear, leaving hypopigmented areas. Pictures illustrate typical lesions. Biopsies of 40 patients were examined. There was infiltration of the dermis with histiocytes, lymphocytes, epithelioid cells, and giant cells, and evidence of collagen degeneration. The nerves were not affected and no mycobacteria were present. The etiology is not known and no effective treatment has yet been found.—(Abstract by A. C. E. Cole, *Trop. Dis. Bull.* 65 (1968) 1048)

## Chemotherapy

Ryzhova, N. Ya. and Bogush, T. G. [The problem of giving sulfone preparations to children with maternal milk.] *Voprosy Leprol. i Dermat.* 21 (1968) 95-97.

After intramuscular injection of 2.0-3.5 ml. of 50% solusulfone in the mother, the preparation was found in the urine of suckled children during a 3 day period. The maximum concentration was noted on the first day and in the milk as well.—AUTHOR'S SUMMARY

Loginov, V. K. and Sluvko, Z. A. [Functional state of the liver in leprosy patients during treatment by several preparations.] *Voprosy Leprol. i Dermat.* 21 (1968) 101-108.

Intensive antileprosy therapy by preparations of sulfone in combination with other means against the background of clinical regression of the leprosy process and improvement of the general state of patients, usually do not change the function of the liver for the worse, but sometimes promote its improvement.—AUTHORS' SUMMARY

Shepard, C. C., Levy, L. and Fasal, P. The death of *Mycobacterium leprae* during treatment with 4,4'-diaminodiphenylsulfone (DDS). Initial rate in patients.

*American J. Trop. Med. & Hyg.* 17 (1968) 769-775.

Lepromatous leprosy patients entering treatment with DDS were followed by repeated biopsies of skin lesions. The bacilli in the specimens were counted, scored for solid staining, and their infectiousness tested by inoculation of mice. Some of the patients were also followed by nasal washings. The infectiousness for mice decreased in the first 30 days, and was only barely detectable at 30 to 90 days, after which it was not detectable. In the range where it could be determined accurately the proportion of solidly staining bacilli decreased in parallel with the infectiousness. The number of bacilli in the skin specimens decreased much more slowly during the period of observation (the first 300 to 400 days of treatment). The rate of loss was estimated to average 0.93 log<sub>10</sub> units (8.5-fold) per year. As observed previously, the number of bacilli in the nasal washings decreased more rapidly than the number of bacilli in the skin. The infectiousness of the nasal bacilli fell at about the same rate as that of the skin bacilli.—AUTHORS' SUMMARY

Stein, A. A. and Khalamanchuk, I. M. [Influence of the antileprosy preparation

solusulfone on the hydrophilic nature of tissues. *Voprosy Leprol. i Dermat.* **21** (1968) 98-100.

The authors made experimental researches in rats on the influence of solusulfone (the Soviet analogy of sulfetrone) on the retention of water in the tissues of the animals. The results were treated by the method of variational statistics and it was proved trustworthily that in the small intestine decrease in the hydrophilic nature of tissues takes place.—AUTHORS' SUMMARY

✓ **Vischer, W. A.** B.663 (G 30320 "Geigy"), ein neues Chemotherapeuticum gegen die Lepra. [B.663 (G 30320 "Geigy"), a new chemotherapeutic agent against leprosy.] *Schweiz., Med. Wschr.* **97** (1967) 308.

DDS is the standard drug for the treatment of leprosy, but in the light of several facts search for new chemotherapeutic drugs is essential. The riminophenazine derivative B.663 is active in certain mycobacterial infections in animals, including murine leprosy, *M. ulcerans* infections, and tuberculosis. No therapeutic effect has been noted in human tuberculosis, but good results have been reported in the treatment of human leprosy, significantly in the case of DDS-resistant disease. Research is in course on clarification of the effect of B.663 on the lepra reaction.—E. R. LONG

✓ **Faye, I., Privat, Y. and Belossi, A.** Traitement de la lèpre par sulfones et sulfamides-retard. Comparaison des résultats thérapeutiques sur 100 cas. [Treatment of leprosy by sulfones and repository sulfonamides. Comparison of therapeutic results in 100 cases.] *Bull. Soc. Med. Afrique Noire (Langue franc.)* **13** (1968) 119-124.

From a study of 100 leprosy cases it was deduced that if the sulfones are first chronologically among antileprosy drugs, second place must be given to the repository sulfonamides in efficiency, provided the patients are young and treatment is early.—J. LANGUILLON

✓ **Pereira, A.C., Jr.** Observações preliminares com sulfamida de eliminação ultra lenta no tratamento da lepra. [Preliminary studies on a long-acting sulfonamide in the treatment of leprosy.] *Anais Brasileira Dermat.* **42** (1967) 35-45.

The author reports the treatment of 23 leprosy patients with Ro 4-4393 for about 1 year (9 lepromatous, 2 borderline, 12 tuberculoid). Satisfactory results were obtained, comparable to results obtained with DDS. The author also notes a remarkable tolerance of patients to this drug and its simple administration; in view of its slow elimination it can be used in weekly doses. It is noted, however, that the period of observation is brief for definite conclusions.—AUTHOR'S SUMMARY

✓ **Goodwin, C. S.** Antipyretic and anti-inflammatory action of flufenamic acid in acute reaction of lepromatous leprosy. *Lancet* **2** (1968) 864-855.

In 22 cases of lepromatous leprosy with acute reaction, flufenamic acid had a significant antipyretic effect, with an accompanying fall in the erythrocyte-sedimentation rate. Erythema nodosum leprosum subsided in 23 out of 25 episodes, and the signs and symptoms of acute leprosy iridocyclitis and neuritis were relieved. High-dosage, short, tapered courses of flufenamic acid up to 25 mgm./kgm. were the most effective, and were well tolerated. One patient given up to 28 mgm./kgm. of flufenamic acid had neutropenia, but 10 days after therapy his leucocyte-count had returned to normal.—AUTHOR'S SUMMARY

✓ **Goloschapov, N. M.** [On the use of methyluracil in complex treatment of perforating trophic ulcer of the sole in leprosy patients.] *Voprosy Leprol. i Dermat.* **21** (1968) 116-117.

Ninety-two patients were treated orally with methyluracil. Good direct results were obtained in 51 patients who were simultaneously subjected to various operations (sequestrotomy, 23 patients; resection of bone, 9 patients; exarticulation, 19 patients; trimming of edges of ulcer, 2 patients).

Healing was established in 48 patients.—  
—AUTHOR'S SUMMARY

✓ **Chandy, P. J.** Nicotinic acid as an adjuvant in the treatment of leprosy. *Leprosy in India* 40 (1968) 46-51.

For the past five years, on the assumption that diminished peripheral circulation of the capillaries, particularly of the extremities is a contributing factor in the manifestations of leprosy stressed by S. N. Chatterjee and others, the author has used nicotinic acid, orally or by injection, as an adjunct to antileprosy chemotherapy. Nicotinic acid, in a starting dose of 50 mgm., was found to increase temperature in lesions and to have a favorable effect in restoration of normality in skin pigmentation, resolution of nodules, reduction of skin thickening, and healing of ulcers.—E. R. LONG

✓ **Languillon, J., Klein, J. M., and Giraudeau, P.** Traitement de la réaction lépreuse a type d'érythème noueux par la thalidomide (N-phthalimidoglutaramide). [Treatment of lepra reaction of erythema nodosum type by thalidomide (N-phthalimidoglutaramide).] *Bull. Soc. Med. Afrique Noire (Langue franc.)* 13 (1968) 116-118.

Thalidomide in a dosage of 400 mgm. orally per day, administered in four 100 mgm. doses at intervals of 7 to 14 days, usually leads to disappearance of erythema nodosum leprosum reactions. However, it cannot be stated that this therapy, which is not prescribed for women, is wholly devoid of risk for men.—J. LANGUILLON

✓ **Bogaert Diaz, H., Herrera, G. and Fernández Henriquez, M.** Tratamiento de la reacción leprosa con talidomida. Primeras observaciones en la Republica Dominicana. [Treatment of lepra reaction with thalidomide. First observations in the Dominican Republic.] *Rev. Dominicana Dermat.* 2 (1968) 36-42.

Thalidomide was used in lepra reaction in 35 lepromatous patients of both sexes, of

whom 10 were hospitalized and 25 received ambulatory treatment. The period of observation of the patients lasted from May to December 1967. The initial doses were 200 mgm. in 15 patients and 100 mgm. in 20. Fever, general symptoms, and cutaneous lesions disappeared with great rapidity. Eighteen patients were able to renew their treatment with DDS without needing readministration of thalidomide. Three patients needed a second course of the medication and 14 needed small maintenance doses (25 mgm. daily) in conjunction with DDS. The improvements obtained were more nearly complete and stable in the patients that received one initial daily dose of 200 mgm. than in those that received 100 mgm. Tolerance was very good in all the patients.—AUTHORS' SUMMARY

✓ **Rojas de Acevedo, R. F.** Eritrodermia por DDS. Reporte de 2 casos. [Erythrodermia from DDS. Report of 2 cases.] *Rev. Dominicana Dermat.* 2 (1968) 43-46.

Two cases of erythrodermia caused by DDS have been reported, one of them with a fatal outcome. Both patients were suffering from indeterminate leprosy in frank lepromatous evolution and were receiving treatment with this medication for a few months in doses that varied between 25 and 50 mgm. daily.—AUTHOR'S SUMMARY

✓ **Ramanujam, K. and Ramu, G.** Toxic reactions to parent sulphone. Report of four cases. *Leprosy in India* 40 (1968) 6-12.

A case of sulfone dermatitis, two cases of dermatitis with bulbous skin eruption, and one case of thrombocytopenic purpura, all arising as toxic manifestations of DDS treatment, are reported.—AUTHORS' SUMMARY

✓ **Balakrishnan, S.** Application of a spot test for detection of DDS in urine. *Leprosy in India* 40 (1968) 1-5.

The aim of the study was to examine the suitability of the spot test method of Castro *et al.*, which employs a modification of the Ehrlich sulfone-detecting reagent, for field

studies of sulfone administration. Results disclosed that the spot test method can detect DDS above the level of 0.05 mgm./ml. of urine. The method can be used for detection of the drug in urine in cases receiving daily doses of 5 mgm. or

more and weekly doses of 25 mgm. or more. Urea interferes in the detection of the drug at very low concentrations, and the color test can be performed with advantage after chromatographic separation.—(From author's summary)

## Surgery and Surgical Specialties

**Bourrel, P., and Piquard, B.** Traitement chirurgical de multinevrites hansenienues. [Surgical treatment of leprosy polyneuritis.] *Bull. Soc. Med. Afrique Noire (Langue franc.)* 12 (1967) 513-517.

The case is described of a patient suffering from leprosy polyneuritis. Neurolysis had been performed on the radial nerve of the left arm, the left median and left ulnar nerves of the elbow and the wrist, the right cubital at the elbow, the right median and ulnar at the wrist, and the right and left lateral popliteal nerves. Palliative treatment included a Thompson operation on the right hand, a Steindler operation on the left hand, and a Zancolli operation that failed, for which compensation had to be attained by a Fowler tenodesis. In both feet transplantation was made of the tibialis posterior, and flexor digitorum brevis muscles to the tibialis anterior and extensor digitorum longus muscles. Another patient with long-standing leprosy polyneuritis had had, 7 years previously, tendon transplantations for median, cubital and lateral popliteal nerve paralysis. Fascicular neurolysis can lead to partial functional recovery and prevent an increase in hyperalgesic reactional neuritis. Cure of the hyperalgia is immediate. Palliative surgery is quite practical in leprosy, as results are long-lasting.—J. LANGUILLON

**Carayon, A., Giraudeau, P., and Languillon, J.** Traitement chirurgical direct des gros troncs nerveux hansenienues. Indications et résultats des 230 interventions. [Direct surgical treatment of large nerve trunks in leprosy. Indications and results

in 230 operations.] *Bull. Soc. Med. Afrique Noire (Langue franc.)* 13 (1968) 1-20.

After a "routine" stage, the authors have arranged cases according to results: (1) hyperalgesic neuritis, 117 cases, with 11 immediate failures, 9 healing after reoperation and 2 setbacks; (2) early revealed nerve deficits, 39 with 30% sensory-motor nerves, 30% with motor recovery, 40% with slight improvement, and 7% failures; (3) neuritis with perforating ulcer of the foot, 55 cases, with 7 failures out of 44, or 16%; (4) partial or slowly progressive old neuritis, with 3 failures out of 7. The methods used, according to particular indications, included simple debridement, exoneurolysis and endoneurolysis. Old neuritides with total damage (98% failures) are to be excluded.—J. LANGUILLON

**Carayon, A.** Effets des états réactionnels sur la main de lepreux. [Effects of reactional states on the hand in leprosy.] *Bull. Soc. Med. Afrique Noire (Langue franc.)* 13 (1968) 140-147.

Lepra reaction, an antigen-antibody disorder, with cellular, lymphatic, vascular and auto-immunity components, readily affects the hand. Medical treatment and associated orthopedic measures may not prevent sequelae, such as cutaneous and muscular involvement (retraction of the first intercommisural space), tendinous (extension of fingers), musculo-cutaneous (contraction of intrinsic muscles) and articular movement (severe stiffness). Curative treatment of lesions must precede palliative treatment of paralysis; their evolution is

modified according to the results obtained.  
J. LANGUILLON

Carayon, A., Giraudeau, P. and Piquard, B. Croix du procede de chirurgie palliative de la main lépreuse paralytique. [Choice of procedure for palliative surgery in leprosy paralysis of the hand.] Bull. Soc. Med. Afrique Noire (Langue franc.) 13 (1968) 148-162.

In flexible claw hand Zancolli's operation is practical. It is simple and effective in 75% of cases. If it fails, the Brand operation is employed. For stiffened claw hand the Sterling-Bunnel procedure is employed for one tendon, that of Riordan for the second and third, and that of Brand for the fourth and fifth. For the thumb it is best to transfer the F.C.S. through a cubital pulley (canal or loop). Extra-ossous fixation is accomplished by means of 2 tongues, one of them securing the end of the long extensor. The carpal pulley is not so opposing. Other procedures effect a kind of tenodesis. The real motor is the thumb flexor, but there is the disadvantage of permanent flexion. Reoperations are studied.—J. LANGUILLON

Price, E. W. A two tendon transplant for low median-ulnar palsy of the thumb in leprosy. Proc. Royal Soc. Med. 61 (1968) 220-223.

Low median-ulnar nerve damage as a cause of thumb paralysis is common in types of leprosy on the tuberculoid side of the spectrum. Previous kinds of operation have been subject to disadvantages. The procedure described in this paper, used in 30 cases, meets objections to other operations by use of two tendons, each in one plane of motion. The operation is best performed as soon as pre-operative care is accomplished. The anatomy of the parts involved is outlined. In the operation the extensor indicis proprius and sublimis are transplanted so as to achieve flexion and rotation of the thumb. The immediate result was good or excellent in all but two of the 30 cases. In these two a second operation attained the desired result.—E. R. LONG

Browne, S. G. Leprosy: an introduction. Physiotherapy 54 (1968) 307-308.

This is the opening of a series of papers bearing on physiotherapeutic aspects of leprosy (see Job, C. K. p. 93; Karat, S. and Furness, M.A. p. 93; Ward, D. J. and Neville, P. J., p. 94, and Goodwin, C. S. and Watson, J. M., p. 86, this issue of THE JOURNAL). The author contrasts the present intensification of study of leprosy with the relative neglect of previous years, and reviews those aspects of the disease in which physiotherapy is a vital element in the total program of care.—E. R. LONG

Job, C. K. Pathology of deformity in leprosy. Physiotherapy 54 (1968) 310-316.

The author reviews knowledge of pathologic states leading to deformities in leprosy, with detailed histopathologic consideration of the nerve lesions responsible, noting first that *M. leprae* is the only bacterium known to infiltrate and parasitize nerve tissue. Lesions are considered under the headings of primary deformity (nerves, skin manifestations, nasal and laryngeal membranes, the eye, bone, synovial membranes, and gynecomastia), and secondary deformity (plantar ulcers, osteomyelitis, Charcot joints and corneal ulcers). In summarizing, the author stresses the place of deformities in the total picture of leprosy, the conspicuous facial deformities, and the sensory and motor deficits leading to ulcers of the hands, feet, and eyes, and skeletal defects named above.—E. R. LONG

Karat, S. and Furness, M. A. Reconstructive surgery and rehabilitation in leprosy. Physiotherapy 54 (1968) 317-322.

The authors note that the widely prevalent stigma associated with leprosy is due mainly to the disfiguring deformities of the disease, which in turn may be primary or due to secondary causes. In this paper these deformities are considered under the headings of (1) cosmetic, (2) disability and deformity resulting from motor paralysis, (3) disability from loss of protective sensation, and (4) loss of sweating, a major



contributing factor in trophic ulceration. In the total group anesthesia is accorded the principal place in the intractable problems of leprosy. The greater part of the paper, illustrated in part by diagrams, is devoted to surgical and rehabilitative procedures for overcoming the series of disorders listed. The paper concludes with a summary of established principles of rehabilitation in leprosy patients.—E. R. LONG

Ward, D. J. and Neville, P. J. Anaesthesia in the hand and foot in leprosy. *Physiotherapy* 54 (1968) 323-326.

This paper emphasizes the major factors in hand deformity as lacks of pain sense, temperature appreciation, and pressure sense. The results of early involvement are gradual, apt to be unobserved, and therefore ignored. Education of patients so that they understand the mechanism of deformity is essential in prevention. It is necessary to develop new work habits and adapted tools. In the section of the paper devoted to the foot the roles of the principal nerves damaged, the popliteal as it winds around the head of the fibula, and the posterior tibial behind the medial malleolus, are brought out in detail. As in the case of the dry hand, restoration of the water content of the skin is of first importance. The greatest problem in the lower limbs is plantar ulceration, which is not a specific leproteic lesion, but a nonspecific one that occurs in any disorder where walking continues on an anesthetic sole. Specific treatment of plantar ulceration is outlined.—E. R. LONG

Carayon, A., and Gruet, M. Orientations nouvelles dans la chirurgie palliative du pied lépreux paralytique. [New orientations in palliative surgery of the foot paralyzed by leprosy.] *Bull. Soc. Med. Afrique Noire (Langue franc.)* 13 (1968) 163-172.

Restoration of dorsiflexion by a 1953 procedure remains the rule (tendon transfer of the tibialis posterior and flexor digitorum longus to the tibialis anterior and extensor digitorum longus). A modification is employed in ease of recurrence of varus,

viz., fixation of the peroneous longus to the reanimated tibialis anterior (comb transfer). To avoid fatigue fractures of the hind part of the foot after transfer, which sometimes occur, subastragal and mediotarsal arthrodesis is practical, according to precise indications.—J. LANGUILLON

Carayon, A. and Valentin, L. Chirurgie palliative après lésions irréremédiables du nerf facial chez le lépreux. [Palliative surgery after irremediable lesions of the facial nerve in leprosy patients.] *Bull. Soc. Med. Afrique Noire (Langue franc.)* 13 (1968) pp. 173-180.

Once an irreversible state is established, only palliative surgery need be considered, viz., a new type of surgery without excessive objective. Possible procedures are numerous. The authors favor a combined prosthetic palpebroplasty at the level of the superior facial and a plasty of the temporal on the arched commissural area. Their conclusions are not definitive, but open the way for investigation of a large series of cases followed for a long time.—J. LANGUILLON

Vartanova, N. G. [Orthopedic footwear in the complex of treatment of foot deformities in leprosy patients.] *Voprosy Leprol. i Dermat.* 21 (1968) 118-124.

Affections are reported of support-promoting apparatus in leprosy patients, beginning with disorder of function and various deformities such as flat foot and paralytic drop foot. Neuritis holds the leading role in their pathogenesis. Orthopedic foot wear is prescribed for reliable fixation of the foot, for the correction of deformities, recovery of the disordered stability, relief in walking, and recovery of disordered or temporarily lost function of the foot or the whole lower extremity. Orthopedic foot wear is necessary for the prophylaxis of various deformities in feet suffering from disease of the neuromuscular system of the lower extremities.—AUTHOR'S

#### SUMMARY

Drury, F. A. and Nelson, J. K. Assessment of the pressure of weight-bearing: the

footprint test. (8 page pamphlet produced by U.S. Department of Health, Education and Welfare. Social Service Rehabilitation Grant RD-2596-G coordinated by above authors, with assistance of P. W. Brand and consultant service of S. E. Klesius.)

The pamphlet deals with the care and prevention of injuries to insensitive feet. Diagrams illustrate the footprint test, designed to determine the pattern of weight distribution on the feet as a measure enabling a physician to prescribe ulcer-preventing shoes or sandals intelligently. The steps in the procedure are (1) administration of standing, short step, and normal firm-surface footprint tests, (2) administration of standing, short step, and normal step-cushioned surface footprint tests, (3)

administration of inside-the-shoe footprint test in patients' shoes as may be indicated, (4) analysis of resulting 14 footprint tests, 7 with each foot, and determination of proper shoe modification or prescription, and (5) completion of shoe modification or prescription and application of the inside-the-shoe footprint test in the new shoes.—E. R. LONG

**Scott, L. B.** Plastic surgery experiences in the Pokhra Valley, Nepal: II. *British J. Plastic Surg.* **21** (1968) 147-152.

Operative treatment is described briefly for the relief of paralyses and correction of deformities in a leprosy center in Nepal, with special reference to facial paralysis, dropped wrist and foot drop, and nasal deformity.—E.R. LONG

## Pathology

**Carayon, A., Languillon, J. and Camain, R.** Lèpre et système lymphatique. [Leprosy and the lymphatic system.] *Bull. Soc. Med. Afrique Noire (Langue franc.)* **13** (1968) 125-139.

In the light of personal angiographic and histologic studies the authors believe the part played by the lymphatic system in leprosy is much more important than has been thought up to now. They reevaluate its significance, noting its role in invasion, dissemination, invasion of Schwann cells, nerve thickening, gynecomastia, osteitis and edema of the leg.—J. LANGUILLON

**Job, C. K., Karat, S. and Karat, A. B. A.** Pathological study of nasal deformity in lepromatous leprosy. *Leprosy in India* **40** (1968) 42-45.

The pathology of collapse of the nose in lepromatous leprosy was investigated by study of biopsies from different parts of the diseased nose. Destruction of the cartilaginous and bony framework of the external nose, due to infiltration by lepromatous

granulation tissue, was demonstrated. Collapse of the nose in leprosy is due chiefly to destruction of the cartilaginous framework of the external nose and partly to erosion of its bony components.—(From authors' summary)

**Metlitzky, N. I., Drujan, M. L., Zwyagintzeva, I. E. and Stegina, N. I.** [Clinicomorphologic and histochemical comparison of skin affections in leprosy and psoriasis.] *Materials of jubilee scientific session, Simferopol, 1968*, pp. 62-64.

Before treatment the disorganization of connective tissue is widely evident, both in foci of specific inflammation and outside them in lepromatous and tuberculoid patients. In nondifferentiated leprosy the elements of the connective tissues are considerably less affected. Changes in biochemical processes connected, first of all, with thiol combinations of protein, nucleoprotein and protein-mucopolysaccharide complexes correspond to a definite background of pathomorphologic changes. The degree of reaction to these substances is always

greater in fresh granulation growth in patients before treatment, and especially at the stages of lepromatous aggravation, and this may be caused by depolymerization of the above mentioned complexes. In old granulation growths it is milder; in destroyed leprosy cells the reaction is very mild or is not evident at all. In treated patients the intensity of reaction gradually decreases to a varying extent. First of all, thiol and mucopolysaccharide combinations are concerned. We failed to note parallel reactions in intensity to the above mentioned substances. Other things being equal, reactions to sulfhydryl groups, ribonucleic acid and neutral mucopolysaccharides proved to be the most changeable, depending on alterations in the clinical course of the disease, the character, and the degree of pathomorphologic changes in the sites of inflammation.—N. TORSUEV.

**Metlitzky, N. I.** [The results of PAS reaction in affected and superficial healthy skin of leprosy patients.] Materials of jubilee scientific session, Simferopol, 1968, pp. 250-251.

One hundred and fifty-eight biopsies of the skin from 92 lepromatous, 15 tuberculoid and 51 nondifferentiated leprosy patients were studied. The intensity of reaction relaxes proportionally to the degree of regression of the disease process. The PAS reaction reaches its maximum in untreated leprosy patients with progressive course of the disease or in patients in a lepromatous reaction phase (LR). The intensity of PAS reaction is not identical in different leprosy granulation growths and in different parts of the same granulation growth, depending on the number of leprosy mycobacteria. The reaction is strongest where the number of globi is highest. Cellular structure of the infiltration and the number of newly formed capillaries have less influence on the reaction intensity. Leprosy cells show a mild reaction, and are more often negative. At the latest stages of the treatment PAS reaction tends to decrease and in its character becomes similar to that of the infiltration in nondifferentiated leprosy. In tuberculoid patients the PAS

reaction is milder than in lepromatous patients, especially in the central zone, where epithelial cells are concentrated and argyrophile fibers are greatly rarefied or absent. In the sarcoid variety the PAS reaction is mild in the whole region of granulation growth.—N. TORSUEV

**Loginov, V. K., Vishnevetsky, F. E., Kurilov, V. J. and Sluvko, Z. A.** [Alterations in the liver in lepromatous leprosy patients.] *Voprosy Leprol. i Dermat.* **21** (1968) 38-50.

In the blood serum of lepromatous leprosy patients who have not undergone anti-leprosy treatment we observe a considerable increase of general protein, a decrease in the proportion of albumin and an increase in globulin content, especially gamma fractions and somewhat rarely alpha<sub>1</sub> and alpha<sub>2</sub>. The cholesterol content is often decreased; bilirubin is increased in many patients. The Weltmann's ribbon tends to become longer. The indices of the Grinstead test are sometimes decreased. Specific granulomas have been found near the central veins during histologic research; they consist of lepra cells, lymphoid and plasma cells, and fibroblasts as well. Nonspecific alterations are expressed by protein dystrophy of hepatocytes, by a disturbance of ribonucleoproteins, glycogen decrease and, rarely, by dystrophic steatosis of cytoplasm of cells. Kupffer cells contain lipids; the reticular stroma of the liver is dystrophically changed, and there is lympho-plasma cell infiltration of the periportal stroma. We have found, by electron microscopy, electron-translucent spaces around the mycobacteria in lepra cells, and electron-dense inclusions and foamy structures developed from them. An accumulation of lipofuscin is found in the hepatocytes; the granular endoplasmic network and the mitochondria are changed.—AUTHORS' SUMMARY

**Kosolapkina, L. I.** [Significance of histologic study during leprosy.] *Voprosy Leprol. i Dermat.* **21** (1968) 33-37.

The author emphasizes the great significance of histologic study during leprosy. Histologic data demonstrate interactions in

a patient's organism and afford a basis for the correct interpretation of the clinical picture. On the basis of pertinent literature the author expresses her opinion that destructively altered leprosy mycobacteria probably lack vital capacity, which is of great importance for estimation of a patient's treatment. The literature on the histochemistry of leprosy affections is reviewed. The data bear on the content of ribonucleoproteins (RNP) and desoxyribonucleoproteins (DNP). During the development of lepromatous granuloma there is an increase in polysaccharide concentration and RNP. In the period of regression there is a decrease in RNP concentration of neutral and acid mucopolysaccharides due to fibroblastic proliferation. Histochemical data permit better understanding of the processes going on in tissues.—AUTHOR'S SUMMARY

**Vishnevetsky, F. E. and Loginov, V. K.** [On nonspecific changes in leprosy and tuberculosis.] *Uspekhi gepatologii*, Vol. 2, pp. 539-555, Riga, 1968. (Book).

Fifty-eight biopsies in leprosy and 29 biopsies in tuberculosis were studied histologically and histochemically. Albuminous, fatty and carbohydrate degeneration, and decrease in the activity of liver enzymes (cytochromoxidase, succinate hydrogenase) were noted. Degeneration and proliferation of reticular fibers with accumulation of neutral mucopolysaccharides, and enzymatically active lymphoplasmatic infiltrates were observed. Modern chemotherapeutic preparations normalize to some degree metabolic and certain enzymatic processes in the liver in patients with leprosy and tuberculosis. This active therapy, however, simultaneously influences the disturbances of fatty metabolism, leading sometimes to chronic hepatitis with possible transition to cirrhosis.—AUTHORS' SUMMARY

**Nazarov, K. I.** [Clinical and prognostic significance of colored sedimentary reaction of urine during leprosy.] *Voprosy Leprol. i Dermat.* **21** (1968) 55-58.

The colored urine sedimentary reaction after Kimbarovsky was tested in 70 patients

with lepromatous leprosy. It became sharply positive 5-16 days before the appearance of the first symptoms of exacerbation when leucocytosis and the bacterioscopic index had not yet warned of a coming exacerbation. The intensity of the reaction was sometimes raised, even in the absence of active clinical symptoms of the disease during bacterioscopic negativity. In such patients the developing lepromatous infiltrates and many mycobacteria were later on revealed histologically.—(From author's summary)

**Zatolokin, F. D.** [The content of microelements in the blood of patients suffering from lepromatous leprosy and tuberculosis simultaneously.] *Voprosy Leprol. i Dermat.* **21** (1968) 59-61.

It was proved by the emissive spectral method that the content of copper, aluminum, silicon and titanium in the blood of patients suffering from lepromatous leprosy and at the same time from tuberculosis is higher than in the blood of healthy persons, but the content of manganese is lower.—AUTHOR'S SUMMARY

**Zatolokin, F. D.** [Content of microelements in the blood of patients in the regressive stage of lepromatous leprosy depending on the duration of the illness.] *Voprosy Leprol. i Dermat.* **21** (1968) 62-63.

The content of copper, manganese, aluminum and titanium in blood of patients in the regressive stage of lepromatous leprosy is reduced in proportion to the duration of the illness. The highest level of silicon concentration is in patients between 20 and 30 years of age, after which it is gradually reduced.—AUTHOR'S SUMMARY

**Rees, R. J. W.** Recent applications of experimental methods to the study of the pathogenesis of leprosy. *Dermat. Internat.* **6** (1967) 216-220.

The successful transmission of human leprosy to animals offers a method to test new antileprosy drugs and to answer the question whether human leprosy bacilli present in dried nasal secretions or in

household dust still retain their infectivity.

**AUTHOR'S SUMMARY**

**Badovskaya, Z. V.** [Tests' on experimental inoculation of animals with human leprosy.] *Voprosy Leprol. i Dermat.* **21** (1968) 73-84.

The author gives a review of 115 chiefly foreign sources on the problem of experimental infection of various animals with human leprosy, including monkeys, rodents, cold-blooded animals, and others. A critical estimation is given of existing methods of inoculation with infectious material taken from persons suffering from leprosy. The perspectives are pointed out as well.—**AUTHOR'S SUMMARY**

**Torsuev, N. A.** [Histopathology of visceral organs in rat leprosy.] *Voprosy Leprol. i Dermat.* **21** (1968) 135-162.

A critical review of the literature supplemented with the results of the research work carried out under the guidance of the author in the laboratory of the Rostov-on-Don experimental and clinical hospital for leprosy patients.—**N. TORSUEV**

**Kurilov, V. Ya.** [Ultrastructure of the rat liver in Stefansky disease.] *Voprosy*

*Leprol. i Dermat.* **21** (1968) 163-165.

The condition of the liver in five rats suffering from Stefansky leprosy was examined at the submicroscopic level. In hepatocytes and Kupffer cells the author found unimportant deviations from the standard. *M. lepraemurium* were found in Kupffer cells, but they were absent in hepatocytes. The overwhelming majority of the subjects had intact protoplasm.—**AUTHOR'S SUMMARY**

**Badovskaya, Z. V.** [Some aspects of the pathogenesis of neurologic disturbance in rat leprosy.] *Voprosy Leprol. i Dermat.* **21** (1968) 166-173.

The mechanism of disturbance of nerve activity in rat leprosy was examined on the basis of modern concepts of anatomophysiological peculiarities in nerve stem disease, of the mechanism of disturbance of the trophic nature of peripheral nerve conductors, and of the physiology and importance of the endoneurial liquid in spreading the pathogenic agents. The author believes that functional disturbance of the somatic and parasympathetic innervation appears due to reduction of the trophic influence of corresponding nerve centers.—**AUTHOR'S SUMMARY**

## Bacteriology and Immunology

**Prabhakaran, K.** Properties of phenoloxidase in *Mycobacterium leprae*. *Nature* (London) **218** (1968) 973-974.

*M. leprae* from infected human tissues oxidizes dopa and a few other phenolic compounds. After incubation of melanoma extract or *M. leprae* with L-dopa the reaction mixture was centrifuged at 15,000 g for 45 minutes at 0°C and the spectrum of the supernatant was measured in a Beckman DU spectrophotometer. In the case of *M. leprae* an intermediate that appeared to be indole-5-6-quinone was found. Results suggest that the decarboxylation step in the oxidation of dopa to melanin by *M. leprae*

is rapid. Under anaerobic conditions *M. leprae* did not oxidize dopa.—**E. R. LONG**

**Baylet, R.** Recherches sur le mycobacterium leprae. Essais de culture. [Researches on *M. leprae*. Attempts at culture.] *Bull. Soc. Med. Afrique Noire* (Langue franc.) **13** (1968) 93-97.

Inoculation of crushed leproma and nasal mucus into egg embryos, and into animals treated by irradiation and cortisone, was unsuccessful. An attempt was made to grow *M. leprae* before and after defatting in solid and liquid media, and in *in vitro* cell culture. The multivacuolated histiocyte

(Virchow's) morphology was reproduced *in vitro*. Slow multiplication seemed to occur in the first days of primoculture.—J. LANGUILLON

Mertzlin, G. V. [Our active modification of the complement-fixation test (CFT) for serodiagnosis of leprosy with the rectified tuberculin of Linnikova as the conditional-specific antigen.] *Voprosy Leprol. i Dermat.* **21** (1968) 64-66.

As a result of research on active modification of the CFT (with the application of the vaccine BCG and tuberculin as the antigens of rat lepromin) in 330 sera of patients with lepromatous leprosy, 33 sera of patients with tuberculoid leprosy, and 109 control sera from practically healthy pregnant females, the author recommends the rectified tuberculin of Linnikova (together with the vaccine BCG and rat lepromin) as conditional-specific antigens in CFT for serodiagnosis of leprosy.—AUTHOR'S SUMMARY

Mertzlin, G. V. and Martynova, V. A. [On the "universal" ability of the sera of patients with lepromatous leprosy to bind complement by different bacterial antigens.] *Voprosy Leprol. i Dermat.* **21** (1968) 67-72.

In a study of the active modification of the CFT by Mertzlin (*see* preceding abstract) 357 sera of patients with lepromatous leprosy were examined. Rat lepromin, BCG vaccine and a 1.5-2 billion suspension of staphylococcus albus and enteric and miraleous bacilli were applied as antigens. All antigens were aqueous. CFT with lepromin and BCG vaccine gave almost 100% positive results in the progressive phase of the disease in association with the presence of group antigens. Eighteen per cent positive results with staphylococcus albus as antigen are apparently explained not by "polyfixing" properties of the sera of lepromatous patients, but as a reciprocal, protective reaction of the patient's organism against the staphylococcus infection. Half of the positive results with the antigen from enteric bacilli and permanently negative reactions with the antigen from the mira-

cleous bacillus are explained by that fact that both these microbes rarely provoke any disease in a human being.—AUTHORS' SUMMARY

Bonomo, L., Pinto, L., Tursi, A., Barbieri, G. and Dammacco, F. Autoimmune reactions and macroglobulins in leprosy. *Dermat. Internat.* **6** (1967) 214-215.

On the basis of finding rheumatoid arthritis factors, L.E. cells, antinuclear factors, biologic false positives and thyroglobulin antibodies, it is suggested that autoimmune factors are important in the pathogenesis of leprosy.—AUTHORS' SUMMARY

Turk, J. L. and Waters, M. F. R. Immunological basis for depression of cellular immunity and the delayed allergic response in patients with lepromatous leprosy. *Lancet* **2** (1968) 436-438.

Biopsy specimens from supratrochlear or axillary lymph-nodes of 9 patients with bacilliferous leprosy were examined histologically. The depression of cell mediated immunity in lepromatous leprosy was found to be associated with a replacement of the paracortical areas of lymphoid tissue with reticulohistiocytes. The histologic appearance resembled that seen in animals given antilymphocyte serum, which also depresses cell-mediated immunity. It is suggested that in the adult the paracortical areas not only are the site of proliferation of lymphocytes involved in cell-mediated immunity but also control their ability to take part in this reaction.—AUTHORS' SUMMARY

Gaugas, J. M. and Rees, R. J. W. Enhancing effect of antilymphocytic serum on mycobacterial infections in mice. *Nature (London)* **219** (1968) 408-409.

Recent findings have led to a surge of interest in the use of immunosuppressive agents for the transmission of experimental leprosy. Antilymphocytic serum (ALS), prepared in rabbits by intravenous injection of mouse thymocytes, was chosen for further study, since, in animals at least, it has proved a powerful and the least toxic immunosuppressive agent yet known. Its

effect was determined in mouse tuberculosis and murine leprosy. The effect of ALS was increased in some cases by a precipitated antilymphocytic globulin fraction (ALG). The studies demonstrated that ALS, and also ALG, significantly enhance the susceptibility of mice to infections with *M. tuberculosis* and *M. lepraemurium*. Prior treatment of mice with normal rabbit serum significantly increased the enhancing effect of ALS, and thus apparently had a "sparing" effect on its action. ALS might provide an alternative, and possibly more practicable method, for establishing progressive infections with human leprosy in mice, which have been achieved thus far through the immunosuppression induced by thymectomy plus total body irradiation. Experiments on this basis, taking advantage of the "sparing" effect of normal rabbit serum and the enhancing effect of ALG, are under way.—E. R. LONG

**Dierks, R. E. and Shepard, C. C.** Effect of phytohemagglutinin and various mycobacterial antigens on lymphocyte cultures from leprosy patients. *Proc. Soc. Exper. Biol. & Med.* **127** (1968) 391-395.

Leprosy patients and normal controls were studied for lymphocyte transformation *in vitro* to phytohemagglutinin (PHA) and to antigen from *M. leprae* and *M. tuberculosis*. Most patients with active lepromatous leprosy, the severe form of the disease, had markedly depressed lymphocyte responses to PHA as well as to the mycobacterial antigens. The response to PHA was only moderately depressed in patients with tuberculoid leprosy, the milder form of the disease, and in patients whose lepromatous disease had been rendered inactive by long-term therapy.—**AUTHORS' SUMMARY**

**Schuppli, R.** Über die Bedeutung des Lepromintests für die Klassifikation und Diagnose bei Lepra. [Significance of the lepromin test for the classification and diagnosis of leprosy.] *Schweiz. med. Wschr.* **97** (1967) 307-308.

The nature and significance of the lepromin reaction are discussed. A negative reaction allows more definite conclusions in the native population of a nonendemic area than in a population originating from endemic areas.—**AUTHOR'S ABSTRACT.**

**Kharabadzhakhov, K. K.** [BCG vaccine in the prophylaxis of leprosy.] *Voprosy Leprol. i Dermat.* **21** (1968) 130-134.

Immunoprophylaxis of leprosy with BCG vaccine proved to be effective. In the 17 areas of the Rostov district, where in 1958-1966 vaccination involved 35,423 persons, registration of the new patients has been decreased 10 times.—**AUTHORS' SUMMARY**

**Baccaredda-Boy, A., Bertamino, R. and Farris, G.** I problemi immunologici dell'infezione hanseniana con particolare riguardo all'possibilità della vaccinazione con il BCG. [The immunologic problem of leprosy infection with special respect to the possibility of vaccination with BCG.] *Dermat. Internat.* **6** (1967) 224-227.

Oral vaccination with BCG is a practical, simple, and harmless method of activating the Mitsuda reaction in healthy persons. Although further studies are necessary, the prophylactic value of such vaccination is confirmed as efficacious when these patients are exposed to leprosy.—**AUTHORS' SUMMARY**

**Pogorelov, V. N.** [The interconnections and interrelations of mycobacterioses and some other infections.] *Voprosy Leprol. i Dermat.* **21** (1968) 85-94.

Evidence is presented that the resemblance in chemical, biochemical and antigenic properties of the mycobacterioses, including tuberculosis and leprosy, indicates the possibility of paraspecific immunity. This thesis can serve as a theoretic basis, in particular, in analysis of the results of application of the vaccine BCG in leprosy prophylaxis.—**AUTHOR'S SUMMARY**

## Epidemiology and Prevention

[The second ten years of the WHO] WHO Chronicle 22 (1968) 267-311.

*Abstract limited to section on leprosy.* The beginning of WHO's second 10 years saw an important change of approach to leprosy control with the recognition that compulsory isolation of patients should be abolished, one reason being that it is more advantageous to reduce infectiousness in many patients than to eliminate it in a few. There are at present more than 11 million cases of leprosy in the world, and the number may be expected to increase to 12 million by 1969. During the decade WHO has assisted a number of countries in leprosy control projects and has advised in those assisted by UNICEF. In 1967, such joint assistance was given to 38 countries, two-thirds of them in Africa. Random surveys showed that in the areas concerned between 75% and 100% of the estimated total of lepromatous cases had been registered and treated. In general, the proportion of infectious cases has substantially decreased. Control has been based primarily on chemotherapy with sulfones, and surveys have shown that 73% of lepromatous patients require more than three years to become bacilli-negative. Poor follow-up and irregular attendance of outpatients for treatment remain major obstacles. Programs are further hampered by various social and economic factors, as well as lack of adequate basic health services, of health education, and of efficient administrative machinery. As campaigns progress, the workload increases and it becomes necessary to establish costly long-term programs, which many countries are unable to afford. In 1965, a WHO expert committee stressed the importance of establishing priorities according to local conditions and recommended that in countries with limited resources attention should be concentrated on the treatment and follow-up of infectious cases and surveillance of their contacts. In addition to holding several regional and inter-regional conferences and seminars on leprosy control during the period

under review, WHO has continued to pay particular attention to training in this field at both national and international levels. A guide to leprosy was produced in 1959 and revised in 1966. A leprosy research program has been organized along the lines laid down by a scientific group on leprosy research in 1959. Among the subjects of study are the preventive value of BCG vaccination and of diaminodiphenyl sulfone (DDS) in leprosy. DDS has been shown to have a protective value for child contacts (up to 10 years of age) of patients with infectious leprosy. Trials of various chemotherapeutic agents have also been undertaken, but none has proved as effective as the sulfones. Developments in the field of immunology have been hampered by the lack of mass cultures of *M. leprae*. In the absence of an immunizing agent and of an antileprosy drug as efficient as penicillin is in the treatment of treponematoses, leprosy control may be delayed for decades pending a rise in standards of living and education at all population levels. Research must therefore be stimulated and coordinated.—AUTHORS' SUMMARY

**Dharmendra.** Epidemiology and control of leprosy. 1. The main epidemiologic features of the disease. *Leprosy in India* 40 (1968) 13-21. 2. Controlling the spread of the disease. *Ibid.* 52-61.

These two articles present a concise summary of salient features of knowledge in the field named. It is noted in conclusion that (a) antileprosy work has been accomplished largely on a voluntary basis, (b) compulsion and legal measures in general are not likely to be important in controlling the disease, (c) legal measures are essential, however, in meeting certain situations, (d) these measures should not be enacted specially for leprosy, but as means for the control of other communicable diseases as well, and (e) an essential prerequisite for success in legal measures is education of the public on the nature of the disease.—E. R. LONG



Varma, A. K. and Prasad, B. G. Role of education in health programmes with reference to leprosy control. *Leprosy in India* 40 (1968) 21-24.

An outline of effective educational measures in leprosy control. These are recognized as dependent on (1) administrative authorities formulating policy, (2) quality and number of disseminators of knowledge, and (3) response of the general public and patients. In conclusion it is stressed that education should include the personal element of courteous sympathy, dispensed by physicians with the same care that medical and therapeutic measures are applied.—E. R. LONG

Gay Prieto, J. El problema de la lucha antileprosa en España. [The problem of the antileprosy campaign in Spain.] *An. Real Acad. Nac. Med.* 83 (1966) 355-398.

This paper represents a report presented by Academician Prof. J. Gay Prieto before the XIX Scientific Session of the Royal Academy of Medicine in Spain. The author reviewed his previous 20 years of international leprosy work, which included a 5-year assignment as Chief of the World Health Organization Leprosy Section, during which he took an active part in planning and organizing of 40 leprosy control programs in different countries all over the world. He noted that through coordinated assessments on expert international work much experience had been gained on the value of the basic policies, strategies, and leprosy control methods followed in countries where leprosy represents a public health and/or social problem. He then emphasized the fact that all modern leprosy control programs should undertake specialized "attack" phase activities (viz., progressive case finding and establishment of treatment of cases and care of contacts by effective prophylaxis) by means of Central Mobile Units headed by leprologists, but temporarily only since the final and permanent operational objective is the integration of leprosy control work in the general public health services.

In 1964, apparently ignoring these recommendations, the new Section of Public

Health Campaigns of the Directorate-General of Health of Madrid, whose chief is a public health career man, abolished the former Leprosy Section (whose chief was Dr. Contreras) and subsequently implemented a new centralized program carried out by specialized mobile units with a staff from Venezuela. In 1965 these units took over all leprosy work from the Dermatology and Leprosy Centers established at the city and rural health centers, and started a limited resurvey through the households of all previously registered cases, together with a control program based mainly on BCG vaccination. Prof. Gay Prieto indicated that in conformity with the above mentioned international leprosy control principles, as laid down by the WHO Expert Committees, the former leprosy section of Spain had developed a successful nation-wide program that covered all endemic leprosy provinces through those provincial centers with dermatologists holding the national Diploma of Leprology from Fontilles in charge of ambulatory and domiciliary case finding and treatment of leprosy cases and their contacts.

Since the change took place, advice from the former Leprosy Advisory Committee has not been sought, while neither evaluations nor reports on the work done by the new Central Mobile Units have been published, and there is evidence that such a staff does not appear to be popular among leprosy patients, who prefer, because of the peculiar social situation of the disease stigma, to continue unrecognized by their neighbors, an objective attained by the former provincial system when patients attended the public health centers together with nonleprosy skin disease patients. As a consequence of such a policy, progressive exodus from the endemic rural areas of south Spain to the big city suburbs is taking place, with the development of 2 important new leprosy foci in Madrid and Barcelona (amounting to more than 350 new cases in each town).

Besides these general considerations, the author pointed out that, as the new section in charge of leprosy has laid special emphasis on BCG prophylaxis, the main leprosy control measures, i.e., DDS treatment

and the regular clinicobacteriologic examination of cases and contacts, have been significantly neglected. As a result of the centralized leprosy control operations described, the situation has deteriorated to such an extent that the future of the leprosy problem in Spain appears seriously jeopardized.

Drafting conclusions from the information supplied, Prof. Gay Prieto felt it necessary to warn the Royal Academy of the fact that the Spanish national leprosy program had suffered an alarming setback, and that an overall and deep reorganization was urgently needed to restore the former normal, stable and efficacious leprosy control situation existing before 1964. He recommended the following measures as the basis to implement such a plan of leprosy operations:

(a) Reestablishment of the permanent Leprosy Advisory Committee.

(b) Restoration of the former leprosy Section.

(c) Reintegration of the leprosy control work through the existing dermatologic city outpatients and Rural Health Centers.

(d) Reimplementation of the basic leprosy control measures and methods, viz., treatment and periodic clinicobacteriologic examination of cases and contacts, done with the required social care and privacy, to get back the necessary regularity and confidence from them.

(e) Establishment of an effective prophylactic program.

(f) Setting up a new program on health education on leprosy.

Dr. B. S. F. Murias, a public health pharmacologist, in an extended discussion, defended the position of the new Section of Public Health Campaigns, stating that any public health officer could undertake leprosy work efficiently without specialized knowledge of leprology, as done with other communicable diseases, and that the Central Mobile Leprosy Units of the new scheme have already proven their value by discovering 81 new cases and by implementing a tighter domiciliary control of the registered cases and contacts. He added that the Section was laying great stress on the BCG program because the method had

been recognized internationally as safer and more effective than other preventive systems. He noted that the so-called Jaen Pilot Project was still going successfully. Disagreeing with Prof. Gay Prieto's argument, Dr. Murias finally stated that the previous antileprosy organization had not been so good and insisted that, on the contrary, the present one did not represent a set-back but a real improvement of the service. Adjourning the session, Prof. Gay Prieto opposed Dr. Murias' remarks and stated that the Academy expected a detailed report from the section on leprosy work carried on by the Central Mobile Units with elaborated statistics to support its statements.—E. R. LONG

Ziedses des Plantés, M., Verhagen, A. R. H. B., Leiker, D. and Koten, J. W. Leprosy in Kenya. *East African Med. J.* 45 (1968) 371-377.

The prevalence of leprosy in several areas of Kenya was reassessed and the results were compared with previous surveys. A hitherto unknown hyperendemic area was found in Ukamba (Kitui District). After more than 10 years of leprosy work in the western province no decrease in prevalence was noticed. Both facts are explained from the present situation in regard to leprosy control work and epidemiologic investigations. Proposed improvements are under study.—AUTHORS' SUMMARY

Basset, A. La lépre au Senegal. (Leprosy in Senegal.) *Schweiz. med. Wschr.* 97 (1967) 304-307.

Senegal has 40,000 leprosy patients, a number placing it among the high endemicity countries of the world. A large majority of tuberculoid forms and minority of lepromatous forms are observed. Intermediate and interpolar forms are difficult to diagnose, and are believed to play a major role in transmission of the disease. The large population of patients presents a difficult therapeutic problem in a developing country. Separate villages for leprosy patients constitute an effective means of combatting the disease, since the most contagious cases remain under medical supervision.—(From author's abstract)

**Sansarricq, H.** Caractères épidémiologiques de la lèpre en Haute-Volta. [Epidemiologic characteristics of leprosy in Upper Volta.] *Méd. Trop.* **28** (1968) 327-344.

The endemicity of leprosy decreases from the south to the north. Three areas in the country are recognized, with prevalence rates as follows: 44/1,000, 22.8/1,000 and 8.5/1,000 population. Women are more frequently affected than men, in the proportion of 5 to 4, but 5 men to 4 women have the lepromatous form. A hormonal factor is concerned in resistance to the bacillus, but not apparently to the tuberculoid form of the disease. The prevalence varies in different ethnic groups without evident explanation. It does not parallel the density of population. Rainfall parallels prevalence.—J. LANGUILLON

**Saugrain, J.** L'endémie lépreuse en république Centrafricaine, (The leprosy endemic in Central African Republic) *Med. Trop.* **28** (1968) 143-152.

This paper reviews surveys made in the Central African Republic from 1959 to 1965 by teams of the "Service de lutte contre les Grandes Endémies." The prevalence of leprosy is very high, with most significant rates in the east near the M'Bomou and Kotto rivers. Only 5% of the patients are lepromatous. Contagion seemed less important in areas of high endemicity, and vice versa; the facts suggest an immunologic interference. Mass treatment by DDS has been highly effective. The organization of the campaign is described, and the importance of close supervision is emphasized.—J. LANGUILLON

**Nine Curet, J., Torres, V. N. and Leopold, N. F.** Leprosy in Puerto Rico. A new look at an old disease. *Bol. Asoc. Med. Puerto Rico* **60** (1968) 53-61.

A study of the prevalence of leprosy among Puerto Ricans is reported. The study includes review of all available records plus field visits. There exists a minimum of 275 documented cases of leprosy among Puerto Ricans. Two hundred and nineteen are currently on the island, 53 in

the United States, and 3 elsewhere. It appears probable that the total number of cases lies between 1,100 and 1,400. Over the past quarter century the reported incidence of new cases has ranged from 1 to 16 per year, with a mean of 6.9. The rate for the entire island is 8.7 cases of leprosy per 100,000 inhabitants. The majority of the patients inhabit the coastal areas, with Naguabo leading all municipalities in concentration of cases. Onset signs and symptoms of leprosy may occur in every decade of life. The modal decades are the teens and twenties. Multiple cases of leprosy were found in 20.3% of the families interviewed. Nonwhites and the lower socioeconomic classes suffer disproportionately from the disease. The two facts are probably related.—AUTHORS' SUMMARY

**Stanhope, J. M., Sturt, R. J., and Russell, D. A.** An outbreak of leprosy in a previously unexposed population of eastern New Guinea. *Trans. Royal Soc. Med. & Hyg.* **62** (1968) 700-711.

An outbreak of leprosy in a previously unexposed population in Brugap village, in the Torricelli Mountains of eastern New Guinea, is described. The outbreak conformed to the pattern of leprosy expected in a newly infected community, as described by Leiker. It resembled the Nauru epidemic in many respects. The prevalence rate was high in both sexes; childhood incidence was low, but adolescent incidence was high. Most patients had one or two tuberculoid lesions, and only two persons (3%) had lepromatous leprosy. Family and social factors were not important, probably because the overall incidence was so high as to submerge them, suggesting that the disease was highly infectious or the population very susceptible. Clinicopathologic correlation was poor in typical tuberculoid cases, but good in others. Overall results of treatment were satisfactory, and no deformities or late neglected or concealed cases were found.—AUTHORS' SUMMARY

**Storck, H. and Schwarz, K.** Zur Diagnose und Differential-diagnose von Lepra-

Einzelfällen. An Hand von 5 in Zurich beobachteten Fällen. (On the diagnosis and differential diagnosis of individual leprosy cases, based on 5 cases observed in Zurich.) *Schweiz. med. Wschr.* 97 (1967) 297-303.

In the light of five cases seen in Zurich the author presents a brief survey on the prevalence of leprosy in Europe, discussing various forms of the disease and types of clinical course. An increase in incidence in industrial countries is due partly to tourism, but mainly to the immigration of a large number of workers from southern Europe seeking employment. Confusion with other endemic diseases with initially similar symptoms commonly delays diagnosis.—AUTHORS' ABSTRACT

✓ **Hermans, E. H.** Die Bedeutung der Lepra im Mitteleuropäischen Raum. [The significance of leprosy in central Europe.] *Internist* 7 (1966) 602-604.

Since several hundred leprosy patients from both east and west were sent to the

lowlands during World War II, an organization was founded to help them medically and socially. It was considered wise to avoid use of the word "leprosy" in the organization's name. The influx of patients ceased and leprosy patients are now to be found in general hospitals. Arrested patients work alongside healthy workers in industry. Is there danger of spread of leprosy in Europe? The author presents figures for several countries. For example, among 35 cases recognized in Germany only one appeared antochthonous. Autochthonous cases, however, are common in endemic areas in southern Europe. Further movement of leprosy patients to the north is not unlikely, creating diagnostic problems. The skin is most important for the early diagnosis of leprosy, and anesthesia of involved areas is highly significant. Other diagnostic features dependent on nerve damage are described briefly. It is important to reserve diagnosis, as far as the patient is concerned, until it is fully established, to avoid development of leprophobia.—E. R. LONG

## Genetics

✓ [Genetics in leprosy] *WHO Chronicle* 22 (1968) 371-373.

This is a condensed review of genetics in leprosy with special reference to genetic markers, comparable to an article that has

already appeared in the *WHO Bulletin* (37 (1967) 461-476 (see abstract, Beiguelman, B. Leprosy and genetics. A review of past research with remarks concerning future investigations. *Internat. J. Leprosy* 36 (1968) 372-373). —E. R. LONG

## General and Historical

✓ **Owen, S. and Bochner, S.** Social factors in the hospital treatment of leprosy. *Med. J. Australia* 2 (1968) 351-353.

The number of registered cases of leprosy in Australia has risen steadily from 1951 to 1966. The authors feel that leprosy can be largely controlled and that the stigma attached to it, although not always logical, has a detrimental effect on patients. They

also feel that it produces a high degree of institutional neurosis. The authors, a psychiatrist and a psychologist respectively, have therefore made a study on some 8 of 11 patients in the new "Institute of Tropical Medicine" at the Prince Henry Hospital, Sydney, New South Wales. Seven of the 8 were found to have varying degrees of institutional neurosis and the move from the old to the new and better quarters in

the hospital did nothing to improve the patients' psychiatric state and social adaptation. In fact, in the new quarters, the staff assumed an even more custodial attitude than previously. A group therapy trial was started in which the patients and staff were encouraged to attend to air their grievances and discuss their problems once a week. The first meetings were poorly attended and attitudes of staff and patients alike appear to have been negativistic. Gradually both attendance and attitudes improved and deeper and more painful issues were discussed. After some 9 months the two most obstructive staff members left and the meetings took on a more constructive tone. Social adaptability and neuroses had improved out of sight in 7 of the 8 patients and this was confirmed by psychologic and clinical testing. Although only a small group was studied, the results suggest that future research in evaluation of such therapy is desirable.—J. C. HARGRAVE.

[Contributing Editor's note: In New South Wales the patients are largely Caucasian (and one Chinese). In the Northern Territory of Australia (about 2,000 miles from Sydney) some 850 patients are registered and most are Australian Aborigines. They attach little, if any, stigma to leprosy as a disease. The majority are treated on an outpatient basis, periods of admission are much shorter than in New South Wales, patients have regular holidays, and occupational therapy, reconstructive surgery and regular work are considered an integral part of their treatment. The atmosphere is therefore very different from that obtaining in New South Wales. The Contributing Editor does not agree with the authors in believing that leprosy is necessarily a largely controllable disease—at present.—J. C. H.]

**Woringer, F. and Burgun, R.** Les enseignements que l'on peut tirer de la lèpre à Strasbourg au moyen âge. [Lessons to be drawn from leprosy in Strasbourg in the Middle Ages.] *Dermat. Internat.* 6 (1967) 236-242.

The progressive disappearance of leprosy in Strasbourg has coincided with the general regression observed in Europe during the 15th and 16th centuries. The diagnosis seems to have been made seriously, without

confusing it with syphilis, which commenced its ravages in the 15th century. Can one say the same thing for tuberculosis? One can ask if leprosy has not regressed by giving up its place to tuberculosis (Chaussinand theory). The problem remains open. Severe but humanitarian rules of hygiene seem to have been essential factors in disappearance of endemic leprosy from Europe. Strasbourg was in the forefront in combatting leprosy through precise measures of hygiene, and, in contrast with the regulations in other cities in respecting the human personality, without rejecting the leprosy patient from society.—(From authors' summary)

**Bogun, V. V.** [Medical work of the Rostov experimental and clinical hospital for leprosy patients from 1947 to 1966.] *Voprosy Leprol. i Dermat.* 21 (1968) 109-115.

Data are given on the admission, discharge and treatment of patients in this hospital for 20 years of its existence. An analysis is presented of schemes of tests used with the preparations proposed for the treatment of leprosy and of the organization of outpatient treatment of patients discharged from the hospital, and clinical and laboratory control of patients during the process of treatment.—AUTHOR'S SUMMARY

**Kerharo J.** Considérations sur quelques aspects de l'étude de la pharmacopée africaine, illustrées par les résultats d'une enquête sur les traitements traditionnels de la lèpre au Senegal. [Considerations of some aspects of a study of the African pharmacopeia, illustrated by the results of an inquiry on traditional treatments of leprosy in Senegal.] *Med. d'Afrique Noire* 9 (1968) 395-405.

A survey throughout Senegal (West Africa) among 49 traditional African healers using plants in the treatment of leprosy revealed observations on 62 specimens of plants botanically identified, whose chemical and pharmacologic properties, however, remain unknown.—J. LANGUILLON

## Other Mycobacterial Diseases

**Blacklock, Z. M.** Infections with *Mycobacterium avium* and Battey strain (serotype Davis) in man in Queensland. *M. J. Australia* 2 (1968) 114-117.

The author describes two cases of infection with *M. avium* type 1, and one with Battey strain, serotype Davis, in adult males with clinical and radiologic evidence of respiratory disease. These are the first cases recorded in Australia of infection in man by *M. avium* type 1. In each case the organism was recovered from the sputum and differentiation problems are discussed. The *M. avium* organisms could be differentiated from the Battey strain organism only by serologic typing.—J. C. HARGRAVE

**Geraci, J. E., Anderson, M. W. and Karlson, A. G.** Endocarditis due to a rapidly growing chromogenic mycobacterium. *Proc. Mayo Clin.* 43 (1968) 124-135.

A case is reported of a 21 year old male with endocarditis caused by a rapidly growing chromogenic mycobacterium of Runyon's mycobacterial Group IV. (Ab-

stract by E. A. Riley, *American Rev. Resp. Dis.* 98 (1968) 560).

**Cohn, M. L., Waggoner, R. F. and McClatchy, J. K.** The 7 H 11 medium for the cultivation of mycobacteria. *American Rev. Resp. Dis.* 98 (1968) 295-296.

Incorporation of casein hydrolysate (enzymatic) in the 7 H 11 oleic acid-albumin-agar medium of Middlebrook and Cohn (*American J. Publ. Hlth.* 48 (1958) 844) promotes the growth of difficult-to-grow, drug-resistant strains of *M. tuberculosis*. The modified medium has been designated 7 H 11. The authors have noted an increasing number of strains of *M. tuberculosis* in treated patients' sputum that grow poorly or not at all on conventional media. The new medium, with certain modifications for sensitivity tests, obviates the difficulty.—E. R. LONG

**Torsuev, N. A.** [The treatment of rat leprosy.] *Voprosy Leprol. i Dermat.* 21 (1968) 174-211.

A critical review of the literature.

## Book Review

**Bechelli, L. M.** A Guide to Leprosy Control. World Health Organization, Geneva, 1966. (Mimeographed)

"A Guide to Leprosy Control," written by Dr. L. M. Bechelli, Chief Medical Officer, Leprosy, of the World Health Organization (assisted in the Appendices by Dr. V. Martinez Dominguez) and published in Geneva in 1966, is the most helpful, authoritative, concise account of leprosy control in the English language. It consists of two main parts and an Appendix. Part I deals with the magnitude of the leprosy problem in the world. The known incidence and estimated prevalence in different continents and countries are given, together

with data on treated cases, disability rates, and the human, social and economic implications of leprosy. Present knowledge of the epidemiology of leprosy is summarized. Then follows a brief, authoritative, and, for 1966, up-to-date account of the diagnosis, classification, treatment and prophylaxis of leprosy; a statement of how modern advances in the subject have altered the technical policy of leprosy control, the current approach to control, and the results and difficulties that may be expected when a control program is undertaken. Part II deals with technical planning and organization of leprosy control projects. In it are considered the medical procedures (case

finding, out- and inpatient care, protection of healthy populations, especially contacts and children, and rehabilitation), health education, training, and the social, legal and administrative measures required to implement such a program. The Appendix covers salient points in the diagnosis of leprosy and the taking and staining of smears, summarizes the Madrid classification, gives various treatment schedules and a classification of disabilities, and suggests different forms and reports suitable for record-keeping and returns.

The "Guide" is indispensable to Medical Officers of Health and general medical officers asked to implement leprosy control programs, and has already proved invaluable to all those (including specialist leprologists) responsible for planning control programs. Much administrative and clinical wisdom is encompassed in a relatively short space. But its very conciseness and orthodoxy is also a challenge to the specialist leprologist. Many current assumptions are stated so clearly that one is forced to reconsider their truth. Are smear-negative ("closed") cases invariably noninfectious, and is it rational to assume that they are only infectious ("open") during reactions?

Is it correct (as stated on pages 21 and 22) to group all types of reactions together? Surely the management of a patient with tuberculoid leprosy in reaction (say, with the threat of facial nerve paralysis, and of ulceration and disfigurement of the skin of the cheek), is very different from that of a patient with severe, chronic, erythema nodosum leprosum. What is the meaning of the phrase "Intolerant to DDS"? But these are only minor random criticisms.

Finally, two pleas are made. First, why does the World Health Organization issue such a helpful book as an "unpublished document," thereby inhibiting distribution and making abstraction, quotation, and even review, subject to their permission. This is scarcely consistent with modern scientific freedom. Second, in view of the many advances being made in the understanding of leprosy (as evidenced by the communications presented at the Ninth International Leprosy Congress), please may a revised edition be issued in the near future; The current "Guide" was completely up-to-date in 1966, and it would be of undoubted advantage to the field of leprosy if its topicality could be maintained for many more years.—M. F. R. WATERS