

CURRENT LITERATURE

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

✓ MERKLEN, F. F., RIOU, M. V. and COTTENOT, F. L'évolution de la morbidité hansénienne au pavillon de Malte de l'hôpital Saint-Louis. [The evolution of the morbidity of leprosy in the Malta pavilion of the Hospital Saint Louis.] Bull. nat. Méd. (Paris) **148** (1964) 371-375.

During the last three years the number of new cases of leprosy detected at or presented to the Malta pavilion has practically doubled: 16 in 1961, 28 in 1962, and 20 in 1963. Africans constituted over $\frac{1}{3}$ of the cases recognized in 1962, and over $\frac{1}{2}$ in 1963. The entry into France, without medical examination, of colored laborers mostly from Sudan, Mauretania, and Senegal—all of which are leprosy endemic countries—is a disturbing problem.—N. BOURCART.

✓ SANSARRICQ, H. Une enquête sur certains caractères épidémiologiques et cliniques de la lèpre en Afrique de l'ouest (Haute Volta). Premiers résultats. [A survey of certain epidemiologic and clinical features of leprosy in West Africa (Upper Volta). Preliminary results.] Med. trop. **24** (1964) 546-565.

This survey, carried out in the district of Kari, showed an overall prevalence, practically the same for both sexes, of 58.4 per 1,000 of the total population. The lepromatous index was 5.2 per 1,000 of the males and only 2.5 per 1,000 of the females. The lepromatous index became positive beginning with the 20-29 years age-group. This late positivization can be considered as a proof of the prophylactic effects of the mass treatment started over 15 years ago in this area. In the totality of the patients, the proportion of lepromatous cases was 5.6%, and of the tuberculoid cases was 75.8%. The results of the treatment were, on the whole, remarkable in this area, where the regularity of the patients in receiving treatment was exemplary, so much so that 80.6% of them had improved. There is still, among the lepromatous, a good number of bacteriologically positive cases, and despite the long-term treatment and regular implementation these cases may become important sources of keeping up the endemic.—N. BOURCART.

✓ WORTH, R. M. and HIRSCHY, I. D. A test of infectivity of tuberculoid leprosy patients. Hawaii Med. J. **24** (1964) 116-119.

The authors, in Hawaii, have searched the official records between 1935 and 1953 for index cases among Hawaiians or part-Hawaiians, whose records permitted classification as either lepromatous or tuberculoid leprosy, and also for exposed children of these cases (without other known exposure) up to the terminal data, after which the follow-up period was too short to permit conclusions on the point. Of the total of 400 such Hawaiian cases, there were 109 that met the criteria for index cases, about equally divided by both sex and type of disease. A total of 397 children were exposed to these cases. The infection rates in the children, according to the disease in the parents, were: 11% (23 cases) of 203 for the lepromatous cases, and 0.5% (1 case) of 194 for the tuberculoid cases. There was no significant difference of attack rates by sex, but children under 10 years of age at the time when the diagnosis was made in the key cases were at the greatest risk.—H. W. W.

✓ HAYASHI, Y. Leprosy infection in married couples and type of these patients. La Lepro **34** (1965) 22-31.

Leprosy infection in married couples is relatively rare; of about 6,000 patients in the Tama Zenshoen leprosarium, 20 cases (0.33%) have been observed. The husband was the source of infection in 12 of the 20 cases (60%), and the wife in 8 cases (40%). The type of infection in the source case was usually lepromatous; 1 case was of the tuberculoid type of

moderate to severe degree. In those that had become infected, the tuberculoid type was predominant with 14 cases (70%); there were only 6 cases (30%) of the lepromatous type. These figures are to be compared to the ratio of 33.5% tuberculoid and 66.5% lepromatous among all the cases in the leprosarium. Whether this predominance of the tuberculoid type is due to early discovery before progression to lepromatous, to greater resistance in the adult, or to other factors cannot be said.—[From abstract.]

✓ JONQUIERES, E. D. L. Funciones del dispensario y del leprosario en la campaña sanitaria anti-leprosa. [Functions of the dispensary and of the leprosarium in leprosy control.] *Rev. argentina Leprol.* **2** (1965) 23-30.

This article reviews the different forms of leprosy prophylaxis since Moses. "Segregation by expulsion" (from the village), "segregation by reclusion" (in leprosaria) and "home segregation" are still in use in many countries. "Prophylaxis of predisposition," without restrictions for the individual except the need of obligatory treatment, but with control of contacts, their occasional prophylactic treatment, and their protection with BCG, is a desideratum which is now followed in few countries (e.g., Mexico), but not accepted *in toto* in others where combination prophylaxis is still in use. The principal measure in the fight against leprosy was by means of leprosaria until the sulfone era. The most dynamic organism, the dispensary, now holds the first place in leprosy control, but the dynamism of the dispensary must be increased in order to project its advantages on the community. Leprosaria are still useful for the treatment of irresponsible patients, for the treatment of acute phases (i.e., lepra reaction) and of surgical sequelae, and for the control and the care of those inmates with marked stigmata who are socially displaced.—AUTHOR'S ABSTRACT

✓ NOORDEEN, S. K. and MOHAMED, ALI, P. Study of 579 families having multiple cases of leprosy. First report. *Leprosy in India* **36** (1964) 176-181.

The authors have studied 579 families that had more than 1 person with leprosy; the average number of affected persons in these families was 2.24. The multiple-case families differed from single-case families and "no-case" families in many minor respects of housing, income, and risk of intrafamilial exposure. However, it was found that the size of the families had nothing to do with the number of cases in them. The multiple cases did not necessarily occur in large families, nor did there seem to be any relationship between the number of secondary cases and the number of persons exposed in a family. With multiple cases the affected persons were somewhat younger, but the age distribution in those families was similar to that of those with single cases. The proportion of females was comparatively higher among families with multiple cases.—[From abstract by J. R. Innes, in *Trop. Dis. Bull.* **62** (1965) 33-34.]

✓ GREBENNIKOV, P. S. and KHARABADJAKHOV, K. K. Further ways of dispensarization of leprosy patients in RSFRS. *Voprosy Leprol. i Dermatol. (Rostov on Don)* **19** (1965) 3-10.

For the development of the dispensaries, the authors recommend the revocation of the histologic study before discharge of leprosy patients to dispensary treatment, imposing upon the dispensary the duty of making such studies. This would shorten the time of hospitalization, decrease the number of beds required, and lead to transformation of the hospitals themselves into antileprosy dispensaries. It is also recommended that the follow-up of patients be limited to 10 years for lepromatous cases and to 5 years for the tuberculoid and indeterminate cases.—(From author's summary, supplied by N. Torsuev.)

✓ EVSTRATOVA, V. A. Contribution to the problem of dispensarization of patients with undifferentiated type of leprosy. *Voprosy Leprol. i Dermat. (Rostov on Don)* **18** (1965) 11-14.

✓ The clinical features were studied and the disease evaluated in 69 patients with the indeterminate form of leprosy. Recommendations are given concerning the duration of treatment, and considerations are presented on the possibility of hospitalization of patients with this form of the disease.—(From author's summary, supplied by N. Torsuev.)

X ROBINSON, H. M., JR. Rehabilitation: A problem for the dermatologist. *Arch. Dermat.* **91** (1965) 198-205.

The primary objective of any rehabilitation program should be to assist handicapped or

injured individuals to achieve physical, social, emotional, and economic independence. The degree of success obtained depends on the provision of expert medical care, psychologic evaluation, physical restoration and motivation of the patient. There are no provisions for the rehabilitation of patients with chronic skin eruptions in any of the established agencies in the United States or Canada. The rehabilitation of well-motivated patients with chronic skin eruptions to a useful and productive existence is a possibility that must not be ignored, and in the future the dermatologist should play a greater role in this type of operation. The complex nature of rehabilitation procedures indicates the need for a team approach to the problem in order to integrate the multiple disciplines. The patient's needs must be individualized so that he may return to his greatest physical, mental, social, vocational, and economic usefulness.—AUTHOR'S ABSTRACT

✓ LANGUILLON, J. La réaction lépreuse: Définition, clinique, pathogénie, thérapeutique. [Lepra reaction: definition, clinic, pathogenesis, therapy.] *Med. Trop.* **25** (1965) 171-181.

Lepra reaction, which occurs only in the lepromatous type, is characterized by general symptoms, cutaneous symptoms (erythema nodosum leprosum, necrotic nodular erythema, polymorphous erythema, Lucio necrotizing erythema) and local symptoms (osteoarthritis, neuritis, myositis, orchitis, and iridocyclitis). In some patients "reactional equivalents" may occur separately, particularly the reactional neuritis of the cubital nerve. Among the biologic symptoms, great importance is given to the test for the C-reactive protein, the positivity of which gives evidence of evolution of the reaction. The histologic picture varies from foci of polynuclears to panniculitis, bacilli always appearing in granular forms. The present concept is that the reaction is due to a rupture of the antigen-antibody equilibrium in lepromatous cases that present a terrain allergic to the products of bacillary destruction. This disequilibrium may be elicited by many factors, but chiefly by therapeutic overdosage, particularly with sulfones. Lepra reaction should be differentiated from certain pseudoreactions that show either evolutive phenomena such as acute lepromatous infiltration, acute tuberculoid exacerbation, or phenomena of mutation such as reactional pseudoexacerbation and reactional tuberculoid leprosy. Of the many treatments that have been recommended, only the antimonial derivatives (particularly the emetic) and corticotherapy have been retained. In reactional neuritis the fascicular endoneurolysis (Carayon) is preferred. The prognosis of the reaction being unfavorable, prophylaxis is based on a specific treatment, the slow progressive dosage of which is adapted according to each patient. On the other hand, all that which may favor the appearance of a reactional state should be avoided.—AUTHOR'S ABSTRACT.

✓ TORSUEV, N. A., BOGUN, V. V., SOKOLOV, V. V. and KHARABADJAKHOV, K. K. The problem of relapses in leprosy patients. *Voprosy Leprol. i Dermatol. (Rostov on Don)* **19** (1965) 38-64.

After a detailed review of the literature of leprosy relapses, the authors present data of 45 cases of clinical and bacteriologic relapses recorded during 18 years among 187 patients kept under dispensary observation by the Rostov on Don experimental leprosarium. The causes of relapses, in the authors' opinion, are inadequate or prematurely stopped treatment, long intervals between the courses of treatment, catching cold, severe intercurrent diseases, physical overstrain, abuse of alcohol, and overtreatment with large doses of sulfone drugs, which probably leads to the blocking of the reticuloendothelial system. Quick disappearance of clinical development observed during the relapses, and their mild course, make it possible to shorten the time of hospitalization of the patients in leprosaria and to facilitate ambulatory treatment.—N. TORSUEV.

✓ LENNOX, W. M. A classification of leprosy foot deformities. *Leprosy Rev.* **35** (1964) 245-249.

In discussing the foot deformities in leprosy, the author outlines a classification of leprosy deformities. *Primary* deformities are those due to the disease process itself, such as paralytic deformities, which are unavoidable without early adequate medical treatment. *Secondary* deformities are due to causes other than leprosy itself, usually resulting from septic complications affecting an anesthetic extremity, and these are preventable. Most secondary deformities of the foot result directly or indirectly from trophic ulceration, which itself is often

the result of neglect of a primary deformity. The natural history of the untreated deformed foot passes from leprosy neuritis to primary deformity and ulcers, to secondary deformity and ulcers, and to destruction or amputation. The primary deformities include muscle imbalance leading to dropped foot with ulcer located on the anterolateral border; dropped foot with the peroneal intact, with ulcer on the antero-medial border; claw toes with ulcer on the dorsum and pulp of toes and on the metatarsal heads. In secondary deformities there is shortened equinus foot, with ulcers on the anterior border; inverted foot, with ulcers on the lateral border; shortened foot with ulcers on the anterior border; shortened plantigrade foot with ulcers on the anterior border; deformity due to joint neuropathy with ulcers on the center of the sole or instep; heel deformities, with ulcers on the heel or multiple sinuses; and calcaneus deformity, with ulcers on the heel. The clinical features of each group are summarized.—[From abstract by J. R. Innes, in *Trop. Dis. Bull.* **62** (1965) 106.]

✓ PRICE, E. W. The etiology and natural history of plantar ulcer. *Leprosy Rev.* **35** (1964) 259-266.

The author holds that the predominating factor in causation of plantar ulcer is the mechanical strain of walking. A small lesion of the foot, if untreated, may progress inexorably to total collapse of the foot. Chronic secondary ulceration may cause the total loss of the function and use of the foot. Every disabled foot in leprosy means deficient care on the part of the patient or the medical attendant; in fact, leprosy should run its course to final arrest by therapy without any major foot deformity or disability other than a degree of anesthesia and some motor palsy.—[From abstract by J. R. Innes, in *Trop. Dis. Bull.* **62** (1965) 106-107.]

PRICE, E. W. The problem of plantar ulcer. *Leprosy Rev.* **35** (1964) 267-272.

Ulceration of the feet undoubtedly causes more unpleasantness for patient and physician than any other complication of leprosy, yet with regular foot inspection and the provision of special footwear successful prevention and treatment are now possible with the minimum of equipment and expense. Amputation may be called for in some psychologic situations, especially when cheap, efficient below-knee limbs are available.—[From abstract by J. R. Innes, in *Trop. Dis. Bull.* **62** (1965) 106-107.]

✓ LANGUILLON, J. Frequency and localization of plantar perforating ulcers of leprosy patients. *Leprosy Rev.* **35** (1964) 239-244.

At the Marchoux Institute at Bamako, Mali, the author, with the help of R. H. Boissan, found among 3,000 leprosy patients 403 who had a total of 1,049 perforating plantar ulcers. The Lechat nomenclature (1956) was adopted for grouping these ulcers, namely: A, heel; B, lateral border of the foot; C, base of 2nd, 3rd, 4th and 5th toes; D, base of big toe; E, medial border of the foot; F, plantar arch. These ulcers were much more frequent in men than in women, and occurred exclusively among adults, i.e., patients more than 20 years of age. There was an overwhelming preponderance in patients with tuberculoid or indeterminate leprosy, as opposed to those with the lepromatous type. They were as much due to vascular as to neural changes. Locations are discussed, a special feature for Africa being the rather greater incidence of ulcers of the heel among females, ascribed to carrying children on the back with increase of lumbar arch. The concept of "the dynamic pressure triangle of the sole" is explained in connection with the mechanics of gait. The walking roll in gait, outlined by Price, is a reality, as evidenced by the 38.1% incidence of ulcers on the base of the big toe, 12.6% on the base of the 5th toe, and 12.2% on base of the heel—a total of 62.9% of pressure triangle ulcers.—[From abstract by J. R. Innes, in *Trop. Dis. Bull.* **62** (1965) 107.]

✓ CARAYON, A., FAYE, I., COURBIL, L.-J. and RESILLOT, A. Indications de la neurographie pour nevríte Hansenienne. [Neurographic indications of leprosy neuritis.] *Soc. Med. Afrique noire de langue française*, meeting of May 15, 1965.

Neurography, a technic soon abandoned but afterwards used again with ultra-fluid lipiodol, elicits in leprosy neuritis three types of indications which are studied. Comparisons with clinical methods diminish the indications of neurography in practice, without suppressing them.—J. LANGUILLON.

CAVE, L., FUSTEC, F., BASSET, A., COURSON, B., LAFFONT, J., PUUYE, I. and LAVIELLE, J. Cent neurographies cubitales chez des Hanseniens. Techniques et resultats. [One hundred cubital neurographies in leprosy patients. Technics and results.] Soc. Med. Afrique noire de langue française, meeting of May 15, 1965.

One hundred cubital neurographies were made of 60 leprosy patients, 70 of them with ultra-fluid lipiodol, which gives more constant results than fluid lipiodol. The technic is simple, and no side effect has been observed. In most cases the results gave an excellent morphologic analysis of the leprosy cubital nerves and it is therefore a good element of the complete examination and of prognosis, and sometimes may even be of diagnostic value.—J. LANGUILLON.

GHOSH, S. and SAHA, K. L. Observations on polyneuritic changes in leprosy. Bull. Calcutta School Trop. Med. **12** (1964) 108-109.

The authors investigated patients attending the Leprosy Research Department of the Calcutta School of Tropical Medicine over the years 1957 to 1961, with respect to the prevalence of deformities. In 18,066 patients they found some form of polyneuritic change in 4,088, mainly secondary (22.03%) and to a small extent primary (only 0.6%). As for type, among 2,131 patients with the maculoanesthetic form 32% showed polyneuritic changes, as did 30% of 4,193 patients with the lepromatous type. It is striking that out of 10,712 patients with tuberculoid leprosy, polyneuritic changes were found in only 16%. Borderline cases numbered only 626, and 29% had polyneuritic changes. Of the 287 patients with the indeterminate form 40% showed polyneuritic changes. Most of the polyneuritic changes (over 97%) were found in adults, and they predominated in patients with lepromatous as against nonlepromatous leprosy (31% against 20%). In children polyneuritic changes were found in 16.7% of 143 with lepromatous leprosy and in 6.6% of 1,182 with other types of the disease. Early detection of leprosy among children is probably responsible for the differential pattern in children. The incidence of polyneuritic changes was much greater in males than in females. The incidence by body site was in the following order of descending frequency: upper extremity, 54.4%; lower extremity, 42.3%; eye, 3.3%. The individual nerves affected were, in order of incidence: ulnar, common peroneal, posterior tibial, radial, facial and median nerves.—[From abstract by J. R. Innes, in *Trop. Dis. Bull.* **62** (1965) 312-313.]

BROWNE, S. G. Conditions mistakenly thought to indicate nerve damage due to leprosy. J. Nigeria Med. Assoc. **2** (1965) 143-144.

During a five-year period, 52 persons presented themselves at the Diagnostic Clinic of the Uzuakoli Leprosy Research Unit, Eastern Nigeria, complaining of diverse conditions which they attributed to nerve damage due to leprosy. Suspected lesions of peripheral nerves accounted for the majority of these conditions, and framboesial palmar fibrosis is signalled out as frequently simulating the ulnar paresis of leprosy, with its finger contractures, wasting and loss of sensation. Nonleprosy lesions of peripheral nerves, due to injury or drugs or pressure from adjacent structures, may cause symptoms indistinguishable from those of polyneuritis due to leprosy. Chronic ulceration of the extremities is often associated in the non-medical mind with leprosy, especially if the ulcer is fetid and sphacelous. None of the very rare diseases of peripheral nerves that closely mimic leprosy was encountered in this series.—AUTHOR'S SUMMARY.

ZHURAVLEVA, G. F. Neurologic lesions in regressive stage of lepromatous type. Vestnik. Dermat. i Venerol. **39** (1965) 68-71.

In the regressive stage of the lepromatous type, tests with nicotinic acid cause no complaints of paresthesia or neurotic pains in the extremities ("phenomenon of ignition") or edema. The test causes increase of erythema of leprosy spots, particularly on their edges, and in most patients thickening of the nerve stems. At the same time vasomotor and pilomotor changes in the hypopigmented areas of the skin and partially on the apparently normal skin, pareses of the cubital and minor femoral nerves, persist, but do not progress.—[From author's summary, supplied by N. Torsuev.]

JURAVLEVA, G. F. Neurological changes in regressive and residual stages of tuberculoïd leprosy. *Voprosy Leprol. i Dermatol. (Rostov on Don)* **19** (1965) 26-30.

Forty patients were examined. In the residual stage the permanent, nonprogressing, residual changes of vegetative, somatic and trophic nature have been found at the sites of former skin lesions and in the areas of affected nerve trunks. The nicotinic-acid test does not cause the phenomena of inflammation and edema at the sites of former lesions or at their edges. Histologically these regions show a commonplace inflammatory infiltration without *M. leprae*. In the regressive state, the nicotinic-acid test sometimes causes visible erythematous patches with more or less intensive and prolonged vasodilatation in the apparently healthy skin, as well as reddening of the edges of hypochromic spots. Histologically at this stage there is an infiltration showing the tuberculoïd structure without *M. leprae*.—[From author's summary, supplied by N. Torsuev.]

JAIN, S. K., VISWANATHAN, R. and CHAKRAVARTY, A. K. Circulatory reflexes in leprosy. *Indian J. Med. Res.* **53** (1965) 8-16.

This first study of circulatory reflexes in leprosy was made in Delhi on 110 patients with the "fully developed" disease of the various types; ages ranged from 21 to 50+; duration (when it could be estimated) varied from 2 to 25 years. All cases had some degree of sensory loss affecting touch, pain, and temperature. As controls, 50 males without evidence of neurologic or cardiovascular abnormalities were used. The method used was to record continuously the intra-arterial pressure, using a polythene catheter and a pressure transducer with a strain gauge amplifier. The effects of Valsalva maneuver, voluntary hyperventilation, mental arithmetic, and cough transients were recorded on this trace. Nine patients showed evidence of block of circulatory reflexes, in that the reflex "overshoot" after the Valsalva maneuver was absent. Mental arithmetic and voluntary hyperventilation elicited normal responses by raising and lowering the pulse and mean pressures respectively, but it took much longer than normal to return to original levels. Also, there was almost no fall in the pulse pressure as a result of reflex vasodilatation after the cough transient. The site of the block appears to be on the afferent side of the reflex pathways of the baroreceptor mechanism.—[In part from authors' summary.]

SLUVKO, S. A. Some indices of the functional state of the kidneys in leprosy patients. *Voprosy Leprol. i Dermatol. (Rostov on Don)* **19** (1965) 31-37.

In an appraisal of the functional state of the kidneys during antileprosy treatment, it was found that in leprosy patients, independently of the type of disease and their age, there were various early pathologic changes of renal function.—N. TORSUEV.

USMANOV, R. K. The nystagmus of the head in leprosy patients. *Voprosy Leprol. i Dermatol. (Rostov on Don)* **19** (1965) 65-67.

The author studied the vestibular apparatus in 200 patients with various types of leprosy. Six male patients of the lepromatous type, aged from 14 to 36, showed nystagmus of the head, from 7 to 15 sec. This sign may be accounted for by intoxication of the labyrinth either by the leprosy infection or by administration of antileprosy drugs.—[From author's summary, supplied by N. Torsuev.]

TORSUEV, N. A. Differential diagnostics of leprosy and some dermatoses in tropical countries. *Voprosy Leprol. i Dermatol. (Rostov on Don)* **19** (1965) 15-25.

The author gives a brief account of the principal signs allowing the differentiation of leprosy from a series of tropical dermatoses.—AUTHOR'S ABSTRACT.

BROWNE, S. G. La lèpre-maladie à problèmes multiples. [Leprosy—a disease with many problems.] *Méd. Afr. noire (Dakar)* **11** (1964) 419-421.

The author summarizes for French readers certain lines of recent leprosy research which in turn raise further questions and problems that necessitate further research. While fundamental questions still remain unanswered, much factual knowledge is accumulating in diverse branches of leprology, assisted by parallel investigations into other mycobacterial diseases. In bacteriology, limited partial success in the realm of animal inoculation has opened the

door to attack on the problems of cultivation of the mycobacterium and the unresolved problems of susceptibility, resistance and immunity, natural and acquired. The grave disadvantage under which, the diagnostician labors because there is no serologic or other test demonstrating leprosy infection, is stressed. In the matter of treatment, the author underlines the problems of variability of the individual response to drugs, and diversity of drug reactions in different settings.—AUTHOR'S SUMMARY.

✓ HENDERSON, A. S. Psychiatric sequelae of leprosy in New South Wales, *Med. J. Australia* **2** (1964) 632-635.

Tuberculosis patients today rarely require legal methods of control, whereas the practice with respect to leprosy varies greatly in different regions. In New South Wales, patients are required to reside in a designated place until three consecutive smears had been found negative, and that might be for an appreciable portion of their lives. Eleven patients who had been in the lazaret for periods varying from 1 or 2 months to 28 years, were studied in some detail with respect to: (1) institutional neuroses, (2) sensory deprivation, (3) reaction to disfigurement, and (4) attitudes to enforced detention. In that institution, for which the Prince Henry Hospital is responsible, males and females are in "separate communities"; each has a two-room apartment with responsibility for its tidiness (some are neat and clean, while others are not); each has a radio, and a television set is available in each department. Yet the attitude toward the living conditions was in all cases antagonistic. It is realized that, as has been the experience in mental hospitals and is now found for leprosy, "the treatment of one disease may lead to the production of another." It is concluded that the situation of the leprosy patients frequently induces severe mental changes, especially institutional neuroses, and that arrangements are required to conserve their mental health.—H. W. W.

✓ GUSSOW, Z. Behavioral research in chronic disease: a study of leprosy. *J. Chron. Dis.* **17** (1964) 179-189.

The present paper represents an initial report of a current project designed to investigate the interplay of emotional and social factors as they operate in modifying or transforming the life program of persons afflicted with a chronic illness. For theoretic reasons leprosy has been selected as the condition for focus. While leprosy has many of the characteristic effects on the patient found in other chronic conditions, from the standpoint of therapy, surgical intervention, or even physical incapacity, leprosy presents certain advantages to a social psychologic investigation of chronic illness, in that social and emotional experiences and phenomena play an exceedingly important role in patient outcomes. These factors, at times, surpass the physical facts of deformity and dysfunction in modifying the career of persons with the disease. It is as a psychosocial phenomenon that leprosy is most challenging to behavioral scientists interested in the description and theory of medical sociology. The present research, however, is not being conducted purely in the interests of sociology or the psychology of nonpsychiatric patients. It is aimed towards a broader framework, that of the slowly emerging field of clinical sociology or clinical anthropology.—AUTHOR'S SUMMARY.

✓ DESTOMBES, P., SILVERIE, CH-R. and RAVISSE, P. Une observation de lèpre dimorphe. [An observation of dimorphous leprosy.] *Arch. Inst. Pasteur Guyane Francaise et L'Inini.* **23** (1963) No. 479 (November).

The authors here report and extend observations on a previously-reported case classified as "dimorphous (borderline)" [see *THE JOURNAL* **31** (1963) 261]. The lesions were two successive nodules that appeared on the prepuce. Histologically they were of histiocytic nature, the cells often fusiform, with abundant bacilli. These lesions were diagnosed as lepromas, and were extirpated *in toto*. The Mitsuda reaction was anomalously positive. Further examination revealed a large anesthetic area on the right thigh, a biopsy specimen from the center of which showed only some round-cell infiltrates. Shortly after being put under treatment with Disulone, there appeared an extensive erythematous reaction of urticarial appearance, bacteriologically negative and without fever. The anesthetic area on the right thigh became slightly erythematous and later typically tuberculoid in aspect; a biopsy specimen (this time from the border) showed tuberculoid changes with a few bacilli. On reexamination of the sections of the lesions of the prepuce there were found, below the thick (nearly 1 cm.)

lepromatous lesion, some isolated nodules of tuberculoid structure, without bacilli. The treatment of the "lèpre borderline" had induced a reaction of the kind variously called "pseudoe exacerbation," or "reversal reaction," or "reactional tuberculoid reaction."—H. W. W.

BETOURNE, C., VALLIN, J., GENTILINI, M. and HAYEM, F. Lèpre lépromateuse à localisation hépatique. [Lepromatous leprosy of the liver.] Bull. Soc. méd. Hôp. Paris **115** (1964) 535-540.

This report is of a case of a typical lepromatous leprosy, concerning which the authors emphasize the nonrecognition of leprosy. This is not exceptional, even in endemic countries, and they emphasize the danger of regarding the case as collagenosis. The interest of this observation lies in the demonstration, by puncture biopsy of the liver, of lesions represented by small lepromatous nodules. Hepatic localization is, in fact, well known to leprologists.—N. BOURCART.

CAMAIN, R., BASSET, A., SICARD, D. and FAYE, I. Maladies de Hansen révélées par un eczéma chronique des membres inférieurs. [Leprosy revealed by a chronic eczema of the lower limbs.] Ann. Dermat. & Syphil. **72** (1965) 39-41.

The authors present from Dakar, observations of two patients with chronic lichenified and very pruriginous eczema of the lower limbs who were diagnosed as tuberculoid leprosy. What is the pathogenesis of these eczemata: vascular, neural or sympathetic origins? Neural disorders occur early in leprosy, and the role of the nervous system in the pathogenesis of the eczema is invoked.—J. LANGUILLON.

LAI, SHANG-HO. Differential diagnosis of leprosy and black foot disease. La Lepro **34** (1965) 7-11. (In Japanese; English abstract.)

By the end of World War II a specific disease, which might have existed in the past but was not known to the public, was found in the down-stream basin of the Pa-Chang River on the southwest coast of Taiwan. This disease was found to cause gangrene and mutilations of the extremities, especially the foot, and was locally known as the "black-foot" disease. By nature it is probably arsenical gangrene. This disease has been feared by the people, for, once affected, patients suffer as much as those with leprosy. In fact certain of the clinical symptoms, such as red swelling of toes and fingers, the initial stage of paresthesia, the breaking of fingers and toes and the later stages of mutilation, resemble some of the symptoms of leprosy. Therefore the differential diagnosis of this "black-foot" disease and leprosy has become necessary in this country. Since few health workers in the field of leprosy control in country have encountered this disease, the similarities and differences of the two diseases are discussed.—[From abstract.]

CONNOR, D. H. and LUNN, H. F. Buruli ulcers—mycobacterial ulceration in Uganda. (A riparian malady.) Internat. Pathol. (Washington) **6** (1965) 1-4.

Mycobacterial ulceration, first reported from Australia, is an endemic problem in the Congo and Uganda. Evidencing its persistent endemicity, accurate descriptions were recorded in Uganda 60 years ago. The first patients studied there in the late 1950's came from Buruli county, an area near Kampala along the upper Nile, but more recently new cases from a variety of locations have been recognized. It shows a remarkable predilection for the peoples of low-population-density areas of the Nile banks, some of which the authors undertook to survey, without success in locating the source of the infection or the mechanism of transmission. Three stages of the lesions are seen: (1) before ulceration, a peculiar widespread coagulation necrosis of subcutaneous fat, without evidence of host response; (2) later the formation of a long-persisting ulceration with sloughing of the skin and of necrotic subcutaneous tissue; and (3) healing, with scar. Colonies of acid-fast bacilli, which appear to be closely related to *M. ulcerans* (McCallum *et al.*, Australia), are found in abundance in the necrotic stage, located in the center of the lesion usually some centimeters behind the advancing edge of the necrosis. In the ulcerative stage bacilli are rare; and they have not been observed in the healing stage. One figure shows an ulcer in a young child that extended from the shoulder to the hand; in another, of a seven-year-old boy, the ulcer affected the dorsum of the foot, extending well up above the ankle; a third, of a ten-year-old boy, shows

an extensive depressed scar on the left upper arm. Nothing is said about treatment except in the legend of one of those pictures; that case was given streptomycin and PAS for two weeks, followed by surgical excision and debridement and skin grafting, after which the lesion healed. Many challenging problems remained to be solved, including the unique type of necrosis that precedes the ulcer.—H. W. W.

✓ BROWNE, S. G. Fixed eruption in deeply pigmented subjects: Clinical observations on 350 patients. *British Med. J.* **2** (1964) 1041-1044.

Pigmentation of the skin and mucosae in up to 3% of Nigerian and Congolese leprosy patients treated with dapsone is reported (in comparison with a reported incidence of 0.15% in S. E. India). Most cases were of the classical symmetric fixed-eruption type, exacerbated by each dose of the drug. Others followed more diffuse reactions and resembled chloasma of endocrine cause. The eruptions might appear early in treatment, even after the first dose, or only after several years. In some instances they faded although the drug was continued. Cross sensitivity with related drugs, e.g., sulfonamides, was seen, and also polyvalent sensitivity involving dissimilar compounds. Phenolphthalein was the only other drug commonly responsible for pigmented eruptions in this series, as is general experience in West Africa where purgatives containing it are popular and freely available.—[From abstract by P. J. Hare, in *Trop. Dis. Bull.* **62** (1965) 109.]

✓ BROWNE, S. G. Dermatological conditions mistakenly attributed to leprosy. *J. Nigeria Med. Assoc.* **2** (1965) 139-143.

An analysis is presented of the dermatoses thought to be evidence of leprosy by 575 persons coming to the Diagnostic Clinic of the Uzuakoli Leprosy Research Unit, Eastern Nigeria, over a five-year period. It is suggested that a study of those dermatoses might provide an instructive commentary for the nonspecialist practitioner confronted by a skin condition that might possibly be due to leprosy. As in most similar series, various types of fungal infection of the glabrous skin provided the largest number of patients (306), followed by hypermelanotic fixed-drug eruptions (56), and diverse hypochromic skin conditions (47), such as symmetric macular hypochromia of uncertain etiology, and nutritional pallor. The various dyschromic manifestations of yaws (29) also figure in the series. Since most of the patients presented themselves voluntarily at the Diagnostic Clinic, the analysis virtually reflects nonmedical thinking about leprosy rather than an accurate representation of the diverse dermatoses in the community.—AUTHOR'S SUMMARY.

✓ STANFIELD, J. P. A case of acute poisoning with dapsone. *J. Trop. Med. & Hyg.* **66** (1963) 292-295.

The author describes the management of a case of acute dapsone poisoning in a girl aged 2 years who had swallowed "one or two tablets" of the drug. When first seen the patient was very ill, cyanosed, restless and vomiting; 36 hours later she became semiconscious, but eventually recovered after an exchange transfusion, and intravenous dextrose saline and 1% methylene blue. She had survived a concentration of dapsone in the blood about 6 times the adult therapeutic level. (In the only previous report of a case of acute dapsone poisoning in a child found by the author, the patient died after swallowing the equivalent of 5 gm. dapsone.) The drug, which is rapidly absorbed but excreted only slowly by the kidneys, has a complex effect on hemoglobin and leads to accumulation of a number of altered products in addition to methemoglobin and occasionally sulfhemoglobin. It is suggested that, if the apparatus is available, dialysis would be preferable to exchange transfusion.—[From abstract by F. I. C. Apter, in *Trop. Dis. Bull.* **62** (1965) 202.]

✓ PETTIT, J. H. S. and REES, R. J. W. Sulphone resistance in leprosy. An experimental and clinical study. *Lancet* **ii** (1964) 673-674.

Although resistance of *M. leprae* is known to develop against a number of antileprosy drugs, resistance against sulfones is a rare event. In fact, it is a matter of debate whether genuine resistance ever occurs. After a search among 2,500 patients in the leprosarium in Selangor, Malaysia, 7 persons with apparent sulfone resistance were selected. All of them were recorded as having received the drug in one form or another for 13 to 15 years, yet

they still had high bacillus indices. After these patients had received a further 6-months course of DDS treatment in the research unit, only 3 were found to have failed to respond, satisfactorily or at all. Before treatment had commenced, mouse foot pads were inoculated (in London) with suspensions of bacilli prepared from homogenized biopsy specimens from each of the 7 cases. All of the 7 strains multiplied satisfactorily, and the 4 strains from the patients who responded to DDS treatment proved to be sensitive in the mouse to DDS; but the other 3 strains proved resistant to DDS. It is held that DDS resistance was fully established for the first time.—[From abstract by D. S. Ridley, in *Trop. Dis. Bull.* **62** (1965) 108.]

LANGUILLON, J. Note préliminaire sur le traitement de la lèpre par le 1906 injectable. [Preliminary note on the treatment of leprosy by 1906 injectable.] *Bull. Soc. Med. Afrique noire langue. française.* **9** (1964) 422-427.

The author reports, in a preliminary note, on the effects of treatment of 14 leprosy patients in the Marchoux Institute by weekly injections of 10 ml. of 20% oil suspension of Su 1906 (DPT) for 1 year, the total dose per patient being 108 gm. of the drug. Therapeutic activity was evident in both the lepromatous and the tuberculoid forms. The action upon the neural lesions is not better than that of other treatments. The occurrence of lepra reactions of the erythematous nodular type is weaker with DPT than with the sulfones. Tolerance, both local and general, was always very good. Although experience with this drug had only been one year, it was believed to be more effective than the injectable suspensions of sulfones presently used in the mass treatment of African patients.—AUTHOR'S ABSTRACT.

ALONSO, A. M. Avaliação dos resultados da cicloserina em 10 casos de lepra lepromatosa. [Evaluation of the results of cycloserine in 10 cases of lepromatous leprosy.] *Bol. Serv. Nat. Lepra* **22** (1963) 15-20.

The author used cycloserine in the treatment of 10 lepromatous patients, with favorable results. One patient became negative in the nasal mucosa after 8 months, and another one after 12 months of treatment. Another one that showed globi on histopathologic examination was completely negative in a later examination made after 14 months of treatment. No synergic action was observed in 3 patients submitted to an associated treatment of TB1 (thiacetazone) with cycloserine. The dosage was 3 tablets of 250 mgm. a day. The drug was well tolerated; no toxic or other side effects were seen. The results are comparable to those of the sulfones and thiacetazone (TB1), but the high price of cycloserine is a handicap to its use.—[From author's summary.]

MORA, M. E. Tratamiento de la lepra con isoxyl (4,4 diisooamyloxythiocarbanilide). [Treatment of leprosy with isoxyl (4,4 diisooamyloxythiocarbanilide).] University thesis. Mexico, Centro Dermatológico Paseua, 1965, mimeograph, 71 pp.

This study discusses the use of isoxyl in leprosy, reviewing its pharmacologic and pharmacodynamic aspects, its clinical application, and its toxicity—which is practically nil. Isoxyl is a disubstituted derivative of thiourea of the N-N'diarylthiourea group, which is used as a tuberculostatic in man with good results. It was first used in leprosy by Buu-Hoi, who found it to be active in all forms of the disease. At the Centro Dermatológico Paseua the drug was tried in 12 cases: 10 lepromatous and 2 tuberculoid, of from 2 to 13 years duration. The doses used were from 100 to 1,500 mgm. daily; the duration of treatment was from 6 to 9 months. Clinical cure was obtained in 2 lepromatous cases, and improvement was seen in the other 8 cases; improvement of bacteriologic count was seen in 6 lepromatous cases, and histologic improvement (degradation of lepromatous structure) in another 2 cases. Lepra reaction occurred in 2 cases. The 2 tuberculoid cases were cured in 6 months of treatment. As side effects, pruritus and slight edema of the limbs occurred in 2 cases, and anorexia in 1 case. The medicament was discontinued in 3 patients: in 2 because of lepra reaction, and in 1 because of severe pruritus.—A. SAUL.

SCHNEIDER, J. Les sulfamides dans le traitement de la lèpre. [The sulfamides in the treatment of leprosy.] *Ann. Soc. Belge Méd. Trop.* **44** (1964) 175-179.

The author reports his recent studies of the sulfamide therapy of leprosy. Sulfame-

thoxypridazine is actually one of the basic drugs for leprosy. The recent discovery of the activity of the acetylsulfamethoxyprazine is evidence of progress in that it can be used orally on a weekly rhythm in mass treatment.—N. BOURCART.

✓ OPROMOLLA, D. V. A. A sulfametoxina no tratamento da lepra. [Sulfadimethoxine in the treatment of leprosy.] *Rev. brasileira Leprol.* **30** (1962) 21-34.

Sulfadimethoxine (Madribon) was tried on 9 untreated patients with lepromatous leprosy, in dosage of 1.5 gm. daily divided into 3 tablets of 0.5 gm. Clinical and bacteriologic examinations were made monthly, and histologic and clinical examinations, with photographs, were made after 6 months. Urinary and blood urea and blood sedimentation investigations were also made. No sign of intolerance or of harmful action was noted. After 6 months, 1 patient was much improved, 4 had improved, 3 were little improved, and 1 remained unchanged. The bacteriologic results did not agree with the clinical findings; the nasal mucosa remained positive in 50% of the patients. The histologic picture followed the clinical course. Reactional phenomena were of medium degree and did not impede the continuation of treatment. Definite conclusions cannot be drawn from the short period of observation, but the author thinks that this drug is useful in leprosy treatment.—[From abstract by J. R. Innes, in *Trop. Dis. Bull.* **62** (1965) 202-203.]

✓ LANGUILLON, J. and CLARY, J. Note préliminaire sur le traitement de la lèpre par une sulfanilamide (Ro-4-4393). [Preliminary note on the treatment of leprosy by a sulfanilamide (Ro-4-4393).] *Bull. Soc. Path. exot.* **57** (1964) 431-441.

This drug was given to 23 patients (12 lepromatous, 1 borderline, and 10 tuberculoid), orally or parenterally, in a weekly dose of 1.5 gm. for from 32 to 52 weeks. Clinical and bacteriologic improvement with tuberculoid transformation was observed in 2 of the lepromatous cases. In the patients with the tuberculoid form, greater improvement was seen. The tolerance to the drug was very good. The injections, however, were painful.—N. BOURCART.

✓ DAVISON, A. R., SCHULZ, E. J., FALKSON, G. and EGNAL, M. L. Effect of cyclophosphamide on leprosy. Competitive action of cyclophosphamide and dapsone. *Lancet* **ii** (1964) 1138-1141.

Cyclophosphamide is a propylene phosphoric ester diamide used in the treatment of neoplasma, although its use is limited by the development of leucopenia. A leprosy patient having been treated with this drug, with favorable results, under the mistaken diagnosis of mycosis fungoides, 8 Bantu patients at Westfort Institution, Pretoria, were given the drug intravenously in doses varying from 400 to 800 mgm. daily, followed, in 4 patients, by 100 mgm. daily by mouth. In 4 patients who received dapsone together with cyclophosphamide, the leukopenic effect of the latter was inhibited. One patient with lepromatous leprosy received only cyclophosphamide for a long time; and benefited considerably. There is evidence that cyclophosphamide may inhibit acute reactions in leprosy.—[From abstract by J. R. Innes, in *Trop. Dis. Bull.* **62** (1965) 203.]

✓ HARTSTON, W. Role of circulating leucocytes in cutaneous leprosy studied by cyclophosphamide-induced leucopenia. *Lancet* **ii** (1964) 1141-1142.

To investigate the idea that the cells of the lepromatous granuloma might be derived from lymphocytes or some other circulating leucocyte, 9 patients with severe long-standing lepromatous leprosy were treated for 5-8 weeks with cyclophosphamide. In all cases the white cell count dropped sharply, the fall being greatest among lymphocytes and eosinophils. There was no noticeable effect on preexisting lepromatous granulomata. Incidental observations were that reactions were not affected but that tuberculin sensitivity was suppressed.—[From abstract by D. S. Ridley, in *Trop. Dis. Bull.* **62** (1965) 203.]

✓ BASSET, A., SICARD, D., FAYE, I. and BASSET, M. Essai de nouveaux médicaments dans le traitement de la lèpre. [Trial of new medicaments in the treatment of leprosy.] *Bull. Soc. Med. Afrique noire langue française* **9** (1964) 418-421.

The authors carried out in Dakar a series of therapeutic trials. (1) Viomycin (viocine), in 1 gm. dose injected intramuscularly 3 times a week in 7 patients for 1 year. Tolerance was

good. Skin improvement was satisfactory and rapid, and there were no neural or trophic disorders. The bacillary count showed only a 50% decrease. (2) 2-mercaptobenzimidazol (Buu-Hoï) was given orally in doses of 300 mgm. per day to 8 patients, with no evidence of toxicity. This treatment failed in 2 patients (1 lepromatous and 1 tuberculoid); there was improvement in the others (3 tuberculoid and 1 lepromatous). (3) Diaminodiphenyl sulfoxine (DDSO, Buu-Hoï) was tried in 9 cases for varying lengths of time, from 3 to 13 months, the dosage being 50 mgm. daily. There was no intolerance. The therapeutic activity of this dose is comparable with that of 100 mgm. of DDS.—J. LANGUILLON.

✓ RAMANUJAM, K. A note on the use of intraneural corticoids in acute leprosy neuritis. *Leprosy in India* **36** (1964) 261-264.

In the Central Leprosy Institute, Chingleput, South India, the author investigated the use of intraneural corticoids in 20 patients. A mixture of hydrocortisone (or dexamethasone), procaine, and hyaluronidase was injected in minimal quantities into the substance of the affected nerve. The patients were examined every day until there was complete subsidence of pain. There was relief from neuritic pain in all patients. Of 18 cases observed for 2 years, there was recurrence of pain in the injected nerve in all but one. Neuritic attacks may occur at any time as part of lepra reaction, and it would be presumptuous to expect lasting relief by 1 or more intraneural injections of corticoids. The treatment aims at reducing the effects of inflammation as quickly as possible by placing corticoid at the very site of the inflammatory process. Systemic oral corticoid therapy is less restricted, being simpler, safer, and more widely applicable under field conditions by auxiliary staff.—[From abstract by J. R. Innes, in *Trop. Dis. Bull.* **62** (1965) 312.]

✓ SEPAHA, G. C. and SHARMA, D. R. Intraneural cortisone and Priscool in treatment of leprosy. *Leprosy in India* **36** (1964) 264-268.

The authors gave intraneural and perineural injections of 1 cc. Priscool (tolazoline), and 0.5 cc. Decadron (dexamethasone) to 21 patients with leprosy neuritis; each patient receiving 10 injections at weekly intervals. Standard oral sulfone therapy was also given. The injections were neither irritant nor toxic. Good results were obtained in over 60% of the patients. Because of the anti-ischemic and antifibrotic action of Priscool and Decadron, not only could a quick recovery be expected, but late sequelae of leprosy could be avoided by giving this treatment early, in conjunction with oral sulfone.—[From abstract by J. R. Innes, in *Trop. Dis. Bull.* **62** (1965) 314.]

✓ MARGNI, R. M., HAUVILIER, O. A., ACERBO, E. O., GUTIERREZ, O., BOBBI, C., CORDAL DE BOBBI, M. E., and CASAVOLA, H. Los mecanismos inespecificos de defensa en los enfermos de lepra. [The nonspecific mechanisms in leprosy patients.] *Rev. argentina Leprol.* **2** (1965) 19-22.

The complement and properdin levels, and the concentration of Ca and Mg ions, were studied in the serum of leprosy patients. The ions Ca and Mg do not suffer variations that could influence the properdin system unfavorably, or the activity of the complement. In tuberculoid cases no modifications of the levels of complement and properdin were observed. In lepromatous cases there were modifications of both, principally decrease of complement in those that present ulcers and malum perforans, and decrease of properdin in those that do not present that type of damage.—[From authors' summary, supplied by E. D. L. Jonquieres.]

✓ DE ALMEIDA, N. C. and SILVA, C. Pesquisas de antitireoglobulin em seros de leprosos. [Investigations of antithyroid globulin in sera of leprosy patients.] *Bol. Serv. Nac. Lepra* **22** (1963) 25-33.

With the purpose of contributing to a better understanding of leprosy immunopathology, the authors investigated the presence of antithyroid antibodies in the sera of 37 cases (23 lepromatous and 14 tuberculoid), employing a modification of the technic of Derrien *et al.* This technic is based upon the agglutination of polystyrene latex particles sensitized with thyreoglobulin. Among the lepromatous cases they found titers of positivity as high as 82.5%, and 45.0% among the tuberculoids. Those titers were not altered by leprosy reactions. The authors reserve conclusions until further work has been done.—[From authors' summary.]

✓ *Goffe*
 LÖFFE, JU. L. and JUCKOVSKAYA, I. I. The vitamin E content in the blood of leprosy patients. *Voprosy Leprol. i Dermatol. (Rostov on Don)* **19** (1965) 84-88.

The authors studied the vitamin E content of the blood of 54 leprosy patients (33 men and 21 women; 48 with L-type and 6 with I-type), and 26 healthy persons (10 men and 16 women). The vitamin E content in all the bloods tested ranged from 0.6 to 2.28 mgm. %; it averaged 1.53 mgm. % in leprosy patients, and 1.66 mgm. % in healthy persons. The therapeutic effect of tocopherol in leprosy neuritis is associated, the authors suggest, with correcting the deficiency of vitamin E content in leprosy patients.—N. TORSUEV.

✓ POPOV, K. and NGUYEN GIA KUEN. Contribution to the histological study of skin changes in lepra. *Dermat. i Venerol.* **4** (1965) 172-177.

On the basis of 205 leprosy specimens from lepromatous patients, the authors analyze the changes in the dermis resulting from the lepromatous infiltrate. Changes are detected in the epidermis (hyperkeratosis, atrophy, pigmentary disorders, and vacuolization of the basal cells), in the hair follicles, and in the sweat and sebaceous glands. A generalized sclerosis is observed on stabilization and healing. The skin changes described assist diagnosis and explain the clinical signs of the ailment.—N. TORSUEV.

✓ RODRIGUEZ PEREZ, A. P. Lesiones de los nervios y terminaciones nerviosas en la lepra lepromatosa. [Lesions of the nerves and nerve endings in lepromatous leprosy.] *Actas Dermo-Sif.* **55** (1964) 643-652.

This report concerns an inquiry into the changes in the nerve components from clinically uninvolved skin areas in leprosy patients, following a previous report that changes were found in the Meissner cells in clinically unaffected areas. In this instance attention was given to the clinically uninvolved tail of the eyebrow of lepromatous cases, the innervation of the hairs being found especially interesting. In some areas there was almost total disappearance of the sensorial somatic component of the palisade, although vegetative amyelinic fibers were partially present. In other cases the palisade had totally disappeared but the vegetative collar of the upper region of the follicle remained.—[From author's summary.]

✓ LANGUILLON, J. Classification immunologique de la lèpre. [Immunologic classification of leprosy.] *Bull. Soc. Path. exot.* **57** (1964) 424-431.

The author proposes an immunologic classification of leprosy based on the morphology of the bacillus, the morphologic aspect of the cell, and the development of a natural factor of resistance.—[Author's summary, supplied by N. Boucart.]

✓ VILLAMIZAR, A. C. Censo inmunológico no lazareto de Contractación (Colombia). [Immunological survey of the Contractación Leprosarium Colombia.] *Rev. brasileira Leprol.* **30** (1962) Nos. 1/2, 35-54.

The author tested with standard lepromin the 1,206 children in the leprosarium, and all of their contacts. Positivity was found to diminish progressively with increase of age. Among the children up to the age of 18 years, only 67 (5.2%) with leprosy were noted, 25 of the indeterminate type, 14 lepromatous, and the remainder (28) tuberculoid. When note was taken of the number of scars indicative of former infection, a total of 11.3% was arrived at as an index of contagion among the child population. The abortive and cicatricial forms constituted a majority. The nodular tuberculoid forms were essentially benign, with good prognosis and spontaneous cure; there was no example of conversion to the malignant form of leprosy. The nodular forms were the earliest manifestations of the disease, the lichenoid and sarcoid forms being next in importance. The average duration of these manifestations varied between 2 and 3 years. Most of the infantile tuberculoid forms left a pathognomonic scar, valuable for retrospective diagnosis and in epidemiologic assessment.—[From abstract by J. R. Innes, in *Trop. Dis. Bull.* **62** (1965) 199.]

✓ ABE, M., HIJIOKA, H., TACHIKAWA, N., OKAMURA, K., ISHIHARA, S. and KOBAYASHI, S. Studies on the preparation, standardization and preservation of lepromin. V. Comparative tests with the Dharmendra antigen containing lipid fraction of leprosy nodule. *Ia Lepro* **33** (1964) 283-290. (In Japanese; English abstract.)

It having been found in sensitized guinea-pigs that the Dharmendra antigen combined

with a lipid fraction of the leprosy nodule (the "combined" antigen) gives stronger cutaneous reactions than the regular antigen, comparative tests were made in leprosy patients to ascertain if the effect of the lipid fraction is seen in the Fernández and/or Mitsuda reactions. The combined antigen was prepared by adding the dried residue of the alcohol-insoluble lipid fraction to the Dharmendra antigen, the weight-ratio of lipid to bacilli being 1:4. The results of the comparative tests showed that the combined antigen gave stronger Fernández reactions than the Dharmendra antigen in 85 nonlepromatous cases, but not in 406 lepromatous cases. With respect to the Mitsuda reactions, however, these antigens showed no difference in the sizes of the reaction in either nonlepromatous or lepromatous cases. Compared with the standard lepromin, the combined antigen gave somewhat stronger Fernández reactions in 21 cases of nonlepromatous leprosy. On the contrary, the combined antigen gave weaker Mitsuda reactions than the standard lepromin in 98 lepromatous cases. These results indicated that the alcohol-insoluble lipid of the leproma has an intensifying effect only on the Fernández reactions in nonlepromatous cases.—[From abstract.]

✓ OKAMURA, K. Studies on the lepromin test. 3. With special reference to desensitization in BCG sensitized guinea-pig. *La Lepro* **34** (1965) 17-21. (In Japanese; English abstract.)

When *leprolin* [italics supplied] is injected repeatedly into BCG-sensitized guinea-pigs, the leprolin reaction becomes negative relatively easily, although the tuberculin reaction is not affected. When viable peritoneal cells of the tuberculin positive-leprolin negative guinea-pig, sensitized with BCG, were transplanted to the normal guinea-pig, the recipient gave negative leprolin and positive tuberculin reactions. Furthermore, both tuberculin and leprolin reactions in the BCG-sensitized guinea-pig, repeatedly desensitized with tuberculin antigen, gradually subsided, and positive tuberculin and leprolin reactivity was not induced in the recipient guinea-pig by the passive peritoneal cell transfer from the guinea-pig that had been desensitized with tuberculin. This inactivation of common reacting factors, corresponding to tuberculin and leprolin antigens, occurs as a result of the combination of the peritoneal cells of guinea-pig, either sensitized or nonsensitized with BCG, with the leprolin antigen *in vitro*. These findings may offer a clue to the difficulty in sensitizing the guinea-pig with human leprosy bacilli.—[From abstract.]

✓ FURTADO, T. A. Subsídio ao Estudo das Relações Imunológicas entre a Lepra e a Tuberculose. [Contribution to the Study of the Immunologic Relationships between Leprosy and Tuberculosis.] Belo Horizonte, Brazil: Imprensa Oficial, 1962, monograph (? pp.).

This monograph reports a study, in groups of healthy, tuberculous and leprosy persons, of the immunologic relationships between leprosy and tuberculosis, based on the early and late lepromin reactions and on the Mantoux reaction. The author's personal experience embraced a total of 2,212 individuals, and—after a detailed study of the results with numerous statistical tables—he arrives at interesting conclusions, among which the following are noteworthy: (1) The early (Fernández) reaction to lepromin behaves like a hypersensitivity reaction, showing strong positivity in tuberculoïd leprosy patients (16%) and in leprosy contacts (15%), but in only a few of the healthy group (4%). (2) This reaction is, on the other hand, of poor sensitivity in tuberculoïd leprosy. (3) The late (Mitsuda) reaction indicates resistance and immunity (100% positivity in tuberculoïd cases) and also a state of allergic hypersensitivity. Its positivity is high among children with close contact with leprosy patients (92.8%) but not in those of the same age who are not under the same circumstances (66.9%). (4) In all the groups of children (healthy, tuberculous and leprosy), the positivity of the Mitsuda reaction was uniformly stronger in those who at the same time reacted positively to tuberculin. (5) Among healthy children the Mantoux reaction was positive more frequently in those with close contact with leprosy patients (67.5%) than in those without exposure or with only slight exposure (37.5%). (6) The number of positive reactors to tuberculin is greater among the Mitsuda positives than among the Mitsuda negatives. These facts suggest that it is possible that *M. tuberculosis* influences the response to lepromin.—[From abstract by A. Vilanova in *Actas Dermo-Sif.* **55** (1964) 379.]

✓ *Looney, R. A.*
 AGUILAR, L. R. La reacción de Medina. [The Medina reaction.] University thesis. Mexico: Centro Dermatológico Pascua, 1965, 101 pp.

The so-called Medina phenomenon or reaction is a special kind of response to lepromin described by Medina in 1944. The present study was carried out on a group of 30 leprosy patients: 23 lepromatous (11 with lepra reaction), 5 tuberculoid, 1 indeterminate, and 1 dimorphous. Four antigens were used: integral lepromin, tuberculin 1:1000, sporotrichin 1:4000, and staphylococcus vaccine. These were given intradermally in the interseapular area. Readings were made in 4 to 6 hours, after which the response injection area was extirpated for histologic study. Macroscopically, a positive response was constituted by erythema, edema, and greyish vesiculation. Histologically, responses considered positive showed intraepidermal debris, eosinophils, and edema of the connective tissue. Only 7 of the 30 cases gave macroscopic response to lepromin (5 lepromatous and 2 reactional tuberculoid), one (lepromatous) to tuberculin, and none to sporotrichin or the staphylococcus vaccine. Six were histologically positive to lepromin. This phenomenon seems to occur not only in lepromatous cases with the Lucio phenomenon, since it was also seen in tuberculoid cases. The 4-hour response does not seem to correspond morphologically or histologically to the Lucio phenomenon or to the necrotizing erythema. It is not an isomorphic reaction or a Fernández reaction, and seems to have nothing to do with lepra reaction; it is doubtful that it corresponds to the Schwartzman phenomenon since it does not occur with the staphylococcus antigen. This test may have prognostic value for following up the evolution of interdeterminate cases, or for the classification of doubtful cases. This paper discusses several approaches to the study of the immunology of leprosy, but it closes pending interpretation of the Medina phenomenon and its value in practice.—A. SAUL.

✓ SHEPARD, C. C. and McRAE, D. H. *Mycobacterium leprae* in mice: Minimal infectious dose, relationship between staining quality and infectivity, and effect of cortisone. *J. Bact.* **89** (1965) 365-372.

The minimal infecting dose of *M. leprae* in mouse foot pads was found to be on the order of 10 solidly staining bacilli, and the order of magnitude was confirmed by experience with inocula containing varying numbers of solidly-staining bacilli from mouse passage and from clinical sources. The staining quality of the bacilli was related in a useful way to the subsequent rate at which bacillary growth appeared. When the proportion of solidly staining bacilli was high, the calculated generation time was shortest; the lower the proportion, the longer the generation time. The results were in accord with the hypothesis that all viable bacilli are solid, and that when they die most of them become nonsolid. Varying proportions of the dead bacilli, perhaps up to 10%, remain solid, at least temporarily. The growth curve of *M. leprae* in mice was followed in several experiments with total counts of acid-fast bacilli and determination of the ratio of solid forms. What had been called a maximal stationary phase was seen to consist of sequential phases of conversion of solid to nonsolid bacilli (death), reappearance of solid bacilli (growth), and conversion of solid to nonsolid (death). When cortisone was administered, leprosy bacilli grew somewhat more slowly during the logarithmic phase, but attained a higher level, especially of solid bacilli.—[From abstract.]

✓ KOHSAKA, K., MORI, T. and NISHIMURA, S. Transmission of leprosy bacillus into immunological tolerance-treated mice. *La Lepro* **33** (1964) 303-309. (In Japanese; English abstract.)

When animals are inoculated with an antigen during fetal or early postnatal life, there occurs a phenomenon known as immunologic tolerance which makes it difficult for the animal to produce antibodies against the same antigen when challenged after maturity. Utilizing this phenomenon, an attempt was made to infect mice with the leprosy bacillus after eliminating resistance. The experiment was carried out 4 times, using a total of 605 mice of the ICF strain. The inoculum contained 3×10^6 — 3.6×10^7 organisms per ml. The animals were divided into two groups, A (with 3 subgroups) and B (controls, 2 subgroups). The inoculations, all involving new-born mice except in one of the control subgroups, are given in detail. The animals were sacrificed after 10-20 months and examined for bacterial proliferation. Subcutaneous connective tissue was excised from macroscopic lesions, while in the animals in

which no change was apparent tissue was removed from the site of injection marked by India ink. A spread tissue preparation was made with the connective tissue specimen, and lymph nodes and other organs were also examined. Material showing proliferation of acid-fast organisms was inoculated on culture media (inoculated at 33° and 37° C), and into the next generation of mice, including both tolerance-treated and untreated animals. The findings show that the pretreatment for immunologic tolerance had no effect on the proliferation of the leprosy bacilli. Acid-fast organisms that could be considered the true leprosy bacillus could not be isolated from any of the leproma materials from 14 cases of leprosy. However, "murine leprosy-like acid-fast bacilli" that could be passed to other mice, similar to those reported by Nishimura, were isolated from 32 of 576 newborn mice (5.6%) inoculated intraperitoneally.—[From abstract.]

COTTENOT, F. Appréciation quantitative sur la bacille de la lèpre murine d'anticorps sériques décelables dans la lèpre humaine. [Quantitative appreciation of serum antibodies against murine leprosy in human leprosy.] *Compt. rend. Soc. Biol.* **158** (1964) 1004-1005.

By utilizing, as antigen, the Stefansky bacilli in indirect immunofluorescence (a close relationship was observed by the same method between the Hansen bacillus and the Stefansky bacillus) the sera of 25 healthy controls were negative and those of 36 leprosy patients were positive. The level of the antibodies was very high in the sera of lepromatous or borderline leprosy patients, but dropped substantially under the influence of effective treatment. On the whole, it was low in the tuberculoid patients, and especially so in the newly treated indeterminate cases.—N. BOUCART.

BASTO, P. M. and TEIXEIRA, H. Exames baciloscópicos em comunicantes. (Aspectos epidemiológicos da lepra no concelho de Pombal.) [Bacteriologic examinations in contacts. (Epidemiologic aspects of leprosy in the council of Pombal.)] *Rev. portuguesa Doenc. Hansen* **3** (1964) No. 9, 7-24.

After attempting to establish the pattern of leprosy in Pombal, the authors state the results of bacteriologic analyses made in 358 out of 1,427 contacts under control in that place. The findings were all negative except the nasal smear from a lepromin-negative female related to a dead lepromatous patient. It is concluded that the finding of only some acid-fast bacilli in the nasal smear of contacts, even with suggestive, but not diagnostic, signs of the disease and with a negative lepromin reaction, does not justify the diagnosis of leprosy. Nevertheless, repeated observations and the prophylactic use of sulfone treatment are advised.—[From authors' summary in English.]

GAY PRIETO, J., RODRIGUEZ-PEREZ, A. P. and ALONSO PUERTA, M. L. Lesiones producidas en la alantoides del pollo mediante la inoculación de productos de enfermos de lepra. [Lesions produced in the chick allantois by inoculation of materials from leprosy patients.] *Arch. Fac. Med. Madrid* **6** (1964) 1-12.

———. Transmisión de alantoides a alantoides, en pases sucesivos, de las lesiones encontrados después de la inoculación de productos de enfermos leproso. [Transmission from allantois to allantois of successive passages of lesions occurring after inoculation of materials from leprosy patients.] *Ibid.* pp. 13-20.

———. Ultraestructura de las lesiones producidas en la alantoides de pollo por la inoculación de productos de lepra humana. Segundo pase de alantoides a alantoides. Resultados previos. [Ultrastructure of the lesions produced in the chick allantois by the inoculation of materials from human leprosy. Second passage from allantois to allantois. Early results.] *Ibid.* pp. 21-28.

1. The authors inoculated specimens from lepromatous, tuberculoid and indeterminate leprosy patients into the chick allantois 12 days after inoculation. In all instances they obtained, after 48 hours, nodular lesions formed of foamy cells in the vacuoles of which they found masses and conglomerates of acid-fast grains. A series of controls permit the assertion that these changes were produced by the leprosy material inoculated.

2. In this series of experiments the authors have succeeded in transmitting, up to 5 passages in the chick allantois, lesions they induced in the allantois by inoculation of materials

from leprosy patients. (They fail to explain if the cause of such lesions is *M. leprae* which simply persists, or if it maintains its ability to reproduce.)

3. In the lesions which the authors have succeeded in inducing in the chick allantois by inoculating materials from leprosy patients, they were unable to see the bacillus, but they found large amorphous acid-fast masses in the cytoplasm of the cells of which the lesions are composed. Studying these granules and masses with the electron microscope they observed structures that incline them to think they have a possible relation with a phase of the hypothetical life cycle of *M. leprae*.—[From abstracts by X. Vilanova in *Actas Dermo-Sif.* **55** (1964) 535-536.]

✓ NAKAMURA, M., MURAOKA, S. and KINOSHITA, T. Effects of various kinds of serum and enzyme on infectivity of *M. lepraemurium* *in vitro*. *Kurume Med. J.* **11** (1964) 102-106.

This is a report of the effects of sera and enzymes on the infectivity of the murine leprosy bacillus, it having been shown in a previous report [see *THE JOURNAL* **21** (1953) 287] that infectivity was maintained for about 60 days at 37°C in Kirchner medium with bovine serum. Each of the 8 sera used (bovine, goat, etc.) were sterilized by repeated heating at 58°-60°C. The enzymes (10 used) were each added aseptically to the bacillus suspension. With the bovine serum, infectivity was maintained for more than 30 days, but with the others it was lost within 20 days or less. Certain of the enzymes (trypsin, papain, ficin and diastase) [and also, it would seem, lysosome], did not inactivate the bacillus after 5 hours at 37°C, whereas the others did within 3 hours, the effect of lipase being particularly prompt.—H.W.W.

✓ NAKAMURA, M., MURAOKA, S. and KINOSHITA, T. Effects of physical treatments on the infectivity of *M. lepraemurium*. *Kurume Med. J.* **11** (1964) 144-147.

Furthering their studies of the survival of the rat leprosy bacillus, the authors report briefly the effects of certain physical treatments. Supernatants of suspensions of rat lepromas, after centrifuging at 3,000 rpm for 10 minutes, were used as the starting material (1) *Heat*: Ampules of the suspension in sterile saline were heated for 30 minutes at various temperatures. Those heated to 55°C or more failed to infect. (2) *Ultraviolet light*: Aliquots of 2 ml. in distilled water were exposed in Petri dishes to the light of a germicidal lamp. They remained infectious after 60 minutes, but there was little survival after 90 minutes. (3) *Shaking*: Aliquots of 10 ml. in M/20 Sorensen buffer were shaken mechanically at 37°C in a water bath. Infectivity was lost between the 3rd and the 5th days, whereas the infectivity of unshaken controls was not lost until between the 5th and 10 days.—H.W.W.

✓ KAWAGUCHI, Y., HIROSE, Y. and KOHSAKA, K. Early evaluation of the multiplication of murine leprosy bacilli using spread tissue preparation. *La Lepro* **33** (1964) 276-280. (In Japanese; English abstract.)

When, in experimental murine leprosy, the infection is produced by subcutaneous or intraperitoneal inoculation, a long period of observation—up to 2-3 months—is generally required. This period can be shortened by using bacillus-counting for evaluating the multiplication of the bacilli, but this method is very complicated technically. Since good results were obtained in our studies by using the spread-tissue preparations to find acid-fast bacilli in the subcutaneous tissues of healthy mice, this technic was used in the early stage of subcutaneous infection to determine the development of murine leprosy. Mice of the C57BL/6 strain (benign) and of the 36H strain (malign) were used with similar results. The mice were inoculated subcutaneously in the back with 0.25 ml. of a 1:1000 leproma suspension, and sacrificed after 1, 5, 10, 15, 20 and 25 days. On the first day, short acid-fast bacilli similar to the initial ones were found in the cytoplasm of mononuclears. After 5 days, there was elongation of the bacilli in mononuclears without increase in number; the maximum length of bacilli was about 2-3 times the initial size. On the 10th day, fairly numerous long forms were observed, a fact suggesting that multiplication had begun to occur. Marked increase in numbers was observed on the 15th and 25th days after the inoculation. Enlargement of the mononuclears, each of which was crowded with long bacilli, could be observed easily at a low magnification. On the basis of these observations, this method can be recommended for the early evaluation of development of murine leprosy.—[From abstract.]

- ✓ UYEDA, S. Etudes sur le *M. leprae* et le *M. lepraemurium*. III. Development microscopique et caractéristique de *M. lepraemurium* cultivé dans la profondeur d'un milieu liquide. [Studies of *M. leprae* and *M. lepraemurium*. III. Characteristic microscopic development of *M. lepraemurium* in the depths of a liquid medium.] *La Lepro* **33** (1964) 265-271. (In Japanese; abstract in French.)

A heavy suspension of the subcutaneous lesions of white rats was cultured in a liquid medium at 30°C, with controls at 5°C. Modifications in the 30°C tubes were noted after 3 to 4 weeks, and became more marked after 8 to 10 weeks, presumably as a result of development *in vitro*. Long forms, measuring 8-15 μ or more, were regarded as true mycelial filaments; they were often segmented and had projected branches. These elements, grouped or tangled together, produced complex forms. From their morphology and arrangement, it was evident that they did not belong to the genus *Mycobacterium*, but to another genus related to *Nocardia*. [Nothing is said of the medium used, or the staining characteristics of the organism cultured.]—H.W.W.

- ✓ UYEDA, S. Etudes sur le *M. leprae* et le *M. lepraemurium*. IV. Developpement microscopique et caractéristique de *M. lepraemurium* cultivé sur milieu solide. [Studies of *M. leprae* and *M. lepraemurium*. IV. Characteristic microscopic development of *M. lepraemurium* cultivated on a solid medium.] *La Lepro* **33** (1964) 272-275. (In Japanese; French abstract.)

A heavy suspension of the lesions of white rats was cultivated on a solid medium (as before), and showed developments after the same time intervals. There were numerous filamentous mycelia with long or short branches, and these divided into numerous segments, producing complex forms. The organism was regarded (as before) as related to *Nocardia*. Cultivation in series awaits the invention of a new technique.—H.W.W.

- ✓ DOMAR, K., MORI, A. and KOHSAKA, K. Transition of bacterial length, RNA, DNA and inorganic phosphate of murine leprosy bacilli in the Hart-Valentine medium. *La Lepro* **34** (1965) 12-16. (In Japanese; English abstract.)

The *in vitro* cultivation of the murine leprosy bacillus is being investigated from the aspect of the energy production mechanism, and it has been shown that electron transmission system stops at the stage of reduced flavin because of absence of the cytochrome system. Under such a condition, it would be impossible for the murine leprosy bacillus to grow *in vitro*. Since the organisms have an enzyme that promotes production of ATP by accepting a high-energy phosphate from polyphosphate, the elongation of the murine leprosy bacillus without increase in number in the Hart-Valentine medium may be explained as depletion of the polyphosphate in the cell. Since we used the Hawaiian strain of the bacillus instead of the Douglas strain, this cannot correctly be considered a reinvestigation. However, an elongation equal to that reported by Hart and Valentine was not found. The marked elongation may be due to a difference in method of collection and the condition of the murine leproma. This, however, should not be considered a constant phenomenon, and it was impossible to investigate factors essential for energy production or growth by using this phenomenon as an index. The results show an apparently slight elongation of the organism, but it is not clear whether there had been an actual elongation, or short cells had disappeared by autolysis. The RNA level showed no change up to 2 weeks, but a rapid decrease took place thereafter. DNA is relatively stable, but there was a gradual decrease. Up to 5 weeks, there is a difference between the hydrolyzed inorganic phosphate and the free inorganic phosphate, but after 7 weeks this difference is no longer apparent. This finding suggests that high energy phosphate is present in the cell up to 5 weeks but is depleted after 7 weeks, resulting in a poor condition for survival. Sucrose is one of the constituents of the Hart-Valentine medium, and this may aid in the elongation of the bacillus; cell lysis of the protoplast or spheroplast of other bacteria is prevented by the addition of 20% sucrose to the medium. The cellular components of the murine bacillus may leak out if biosynthesis in the cell wall does not parallel the *in vitro* elongation, and fissures occur in the cell wall in a medium lacking sucrose. If it is the aim to supply the materials for biosynthesis of the cell wall, bouillon that contains polysaccharides, lipids, and purine and pyrimidine derivatives would be much more advantageous.—[From abstract.]

MIKHAILOV, V. V. and BADOVSKAYA, Z. V. The mechanism at the basis of the deranged spinal cord reflex activity in leprosy rats. *Patolog. Fiziol. i Exper. Terapi.* **8** (1964) 61-65.

Two to 2½ months after infection rats inoculated with leprosy demonstrate a considerable disturbance of the reflex excitation in the skeletal muscles of the posterior extremities, with insignificant functional changes of the peripheral motor neuromuscular apparatuses and complete integrity of the receptor and afferent nerve function. After 5 or more months, apart from disturbances of the reflex excitation, there occur serious functional derangements of the motor innervation of the peripheral portions of the skeletal muscle, manifested by block of excitation conduction along the rapidly conducting nerve fibers. Receptor and sensory conductor activity remains fully intact.—N. TORSUEV

SHEPELEV, A. P. Some data of lipid metabolism in murine leprosy. *Veprosy Leprol. i Dermatol.* (Rostov on Don) **19** (1965) 68-73.

In 34 white rats infected intraperitoneally with *M. lepraemurium*, changes in lipid metabolism in the blood have been studied in the dynamics of the evolution of the disease and compared with morphologic changes in the visceral organs. The results demonstrate a considerable increase of lipid-phosphorus, a decrease of cholesterol-ester levels, and a diminution of general esterified fatty acids, together with an increase in their relative nonbound state. Quantitatively these changes are related to the rate of specific morphologic changes in the visceral organs, and chronologically precede their appearance.—From author's summary, supplied by N. Torsuev.)

MØLLER-CHRISTENSEN, V. and INKSTER, R. G. Cases of leprosy and syphilis in the osteological collection of the Department of Anatomy, University of Edinburgh. With a note on the skull of King Robert the Bruce. *Danish Med. Bull.* **12** (1965) 11-18.

A study was made of 1,732 crania, predominantly of exotic origin, and also of the original plaster cast of the skull of King Robert the Bruce made in 1819 and of a modern copy of the latter. The material studied was in the Anatomy Department of the University of Edinburgh. Three cases of *facies leprosa* were found. The plaster cast of Robert the Bruce showed clear signs of *facies leprosa*, but for certainty it would be necessary to disinter the skeleton once more and examine it in the light of modern knowledge.—(From authors' summary.)

ROTBERG, A. and LESER, W. Florescimento e Declínio dos Focos Historicos de Lepra: Ineognitas e Ensinamentos [Rise and fall of historic foci of leprosy.] *Rev. Assoc. Med. brasileira* **10** (1964) 209-215.

The difficulties of a historic study of the development, decline and eradication of old leprosy foci in Europe, the Philippines, Hawaii and the Americas are noted. They result largely from lack of precise terminology and trustworthy clinical, epidemiologic and statistical data. An analysis of current declines indicates that important factors of great influence in the host-parasite relation are still common. Data from Norway, Iceland, New Brunswick, and Nigeria suggest that, among other causes, the following are significant: improvement in personal and general standards of hygiene; education directed toward popular understanding of the problems of prophylaxis; early diagnosis; measures to reduce contact between sick and well. Among the last named, house and hospital isolation are to be considered for special cases and in such a way as to lead to popular acceptance.—(From authors' summary.)