

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.

GONZÁLEZ PRENDES, M. A. Gerhard Henrick Armauer Hansen (1841-1912). *Leprosy Rev.* **35** (1964) 127-147. (Issued originally in *Finlay* 1 (July-December) 1963, 27-54. Translation by J. Ross Innes.)

One of the several biographies of Hansen that have been published recently. This one contains important details to which much more attention is paid than in other biographies the reviewer has seen. It is correspondingly valuable. These details are so numerous that the original must be consulted.—E. R. LONG.

SKINSNES, O. K. Leprosy in society. I. "Leprosy has appeared on the face." *Leprosy Rev.* **35** (1964) 21-35.

Beliefs and practices of sample segments of South China, supplemented by reports in Chinese medical journals, indicate a very ancient belief that leprosy was regarded as a punishment inflicted upon transgressors of moral law, that it was incurable, and that it would be transmitted by those affected to future generations. These concepts are embedded in the folklore of the common people and are unaffected by Western concepts, which are in some measure the results of scriptural tradition regarding leprosy.—E. R. LONG.

SKINSNES, O. K. Leprosy in society. III. The relationship of the social to the medical pathology of leprosy. *Leprosy Rev.* **35** (1964) 175-181.

The pattern of social abhorrence and persistent reaction to leprosy is unique among diseases in its intensity, inventiveness and ubiquity. The presence of this reaction and behavior pattern is not an evidence of unique racial or national benightedness but is remarkably similar in major cultures of both the Orient and the Western world and reaches far back into antiquity. The social reaction to leprosy is not attributable to any specific writing (e.g., the Bible) or religious or ethical formulation, although it is clear that the writings and records of any given society will perpetuate its concepts as well as reflect and record its reactions. The social pathology respecting leprosy is related to, and called forth by the medical pathologic complex which is unique to leprosy and which gives the disease its entity. An alternatively possible explanation, thus far unexplored, is that the ancient, persistent concepts and reactions to leprosy originated in one center of ancient leprosy endemicity, e.g., possibly India, and then diffused westward and eastward, perhaps with the spread of the disease, to become reflected eventually in diverse folklores and writings. However, there is at present no convincing evidence available regarding the origin and early spread of leprosy or of similar spread of reaction to the disease. In any case, granting such spread would not vitiate the relationship suggested between the social and medical pathology of leprosy. Changing the name of the disease in an effort to throw off or obscure the long-standing social reaction to it is a formidable task in view of the multiplicity of terms synonymous with leprosy in many languages, and in view of the weight of literature in which the term leprosy and its synonyms are irrevocably embedded. It would seem that a more rational approach would be to acknowledge the weight of opprobrium while at the same time, through the light of understanding of its genesis, challenge society with rational understanding of its irrational fear. Recent, real and continuing, advances in the treatment of leprosy are also the most potent therapy for its social pathology. They break the pattern of both the social pathology and medical pathology of the disease, for they promise relief from

the chronicity and deforming effects of the disease, and perhaps, in time, from the disease itself, with consequent negation of the whole disease pattern which has so disturbed society. It makes possible the replacing of the picture of divine, irrevocable retribution with that of an understood disease subject to management and control.—AUTHOR'S SUMMARY. (See also: Editorial "The Social Stigma of Disease" in this issue of THE JOURNAL.)

✓ DHARMENDRA. Regional variations in leprosy. *Leprosy in India* **35** (1963) 7-10.

Intrinsic and extrinsic factors may be responsible in varying degree for regional and racial variations seen in different parts of the world and different races. We can control some of the extrinsic factors and should take necessary steps. These are mainly sanitary and hygienic conditions. There should be no overcrowding and no indiscriminate mixing with patients. Another factor, which though not directly connected with leprosy, is indirectly related to all diseases including leprosy, is raising the economic standard in a population, with improvement of diet and better living conditions.—(From author's summary.)

✓ MOHAMED ALI, P. Facts and figures about leprosy in India. *Leprosy in India* **35** (1963) 10-16.

Collection of vital statistics in India has been far from satisfactory. Records for leprosy inevitably have been unreliable. Figures quoted by Indian leprologists have been widely divergent. The 1931 census put the prevalence at 0.15 million. Successive surveys by trained workers in different parts of the country indicated that census figures should be multiplied by 8 or more to obtain a final figure on the total number of cases. Subsequent estimates have ranged from 1 million to the latest, which is based on figures given by various state leprosy officers and public health officials, of 2.5 millions. The validity of this figure, however, cannot be substantiated.—E. R. LONG.

✓ CHANDY, P. J., PATRICK, G. S. and BRAMWELL, F. E. Leprosy in Uttar Pradesh. *Leprosy in India* **35** (1963) 128-131.

In Faizabad over a period of 24 years more than 27,000 cases of leprosy have been found in adults, but less than 1200 in children. The Faizabad Leprosy Hospital, which is widely known in the area, served as a base for examination and treatment. Early lesions of leprosy are recognized by the population. Adult patients in more than 2000 villages were found to be familiar with the significance of anesthetic and hypopigmented patches. In Barabanki 7649 cases of leprosy, in some 8000 rural communities with a population of 1,411,833 (1961 census figures), have been seen, although no specific leprosy surveys have been made. Some 4000 patients have come voluntarily for treatment from about 1000 villages. Of these, 23% were lepromatous and 77% nonlepromatous, and 89.3% male and 10.7% female. The age period 26-45 accounted for more than half of the cases. The probable source of infection was considered familial in 26%. Observations in Faizabad and Barabanki do not support the view that children are more susceptible to leprosy than adults. As seen in the study here reported, leprosy in children was usually in benign form. The authors' experience indicates that current antileprosy measures in Uttar Pradesh are inadequate for control of leprosy. A proper program should be included in the general public health and social welfare program of the country. Widespread, intensive institutional treatment can do great good, not only in its effect on the prevalence of leprosy locally, but also as an example for propaganda.—E. R. LONG.

✓ CONTRERAS, F. Ponderación de una campaña antileprosa a los 15 años de su iniciación. (Evaluation of an antileprosy campaign 15 years after its initiation.) *Acta Leprol.* No. 13 (1963) 3-29.

The author reviews the epidemiology and history of control of leprosy in Spain since 1948, when the Central Service of Leprosy was created. Control is effected through 93 dermatologic outpatient clinics in towns, 68 leprosy consultants and 20 mobile teams in rural districts, and the collaboration of 140 dermatologists. As a result of in-

tensive search for patients and contacts, and systematic examination of the population, all existing patients are known and their regular treatment is assured. The number of new cases is steadily diminishing, and the number of cured cases increasing. Graphs and tables show the favorable development of an effective campaign, and raise hope for eventual total eradication of the disease.—AUTHOR'S SUMMARY.

✓ TERENCIO DE LAS AGUAS, J. Caso de lepra autóctono de Santander. (Case of autochthonous leprosy in Santander. *Rev. Leprol. Fontilles* **5** (1963) 723-726.

A case is reported of a man 72 years old with tuberculoid leprosy who had never left Spain nor his own province of Santander. He had not been acquainted with leprosy patients. It was considered possible that he had contracted the infection, while working in the mines, from persons coming from regions where the disease is endemic.—AUTHOR'S SUMMARY.

✓ QUAGLIATO, R., CARLOTTI, C. C., LIMA, A. T. and CARMARGO, D. P. Censo leproológico intensivo. Usina Ester, Município de Cosmópolis, Estado de São Paulo. Dispensário de Lepra de Campinas, 1959-1960. [Intensive leprosy survey. Usina Ester, Municipality of Cosmopolis, State of São Paulo. Leprosy Dispensary of Campinas, 1959-1960.] *Rev. brasileira Leprol.* **31** (1963) 84-90.

An intensive leprosy survey, carried out at Usina Ester, Cosmopolis, São Paulo, Brazil, from August 1959-January 1960, is reported. Several advantages promoted the value of the survey; the population, consisting of 658 families, was stable; a record by name of the entire population was available; the prevalence index of the disease was high (4.4%); regular community public health control was practiced. The work was done in 3 phases: (a) dermatologic examinations and lepromin tests on primary school children; (b) assemblage of the rest of the population and examination at designated centers; (c) search of still unexamined persons in cooperation with a woman physician. Between the time of administration of the test and reading of the reaction BCG was administered to 284 school children. The lepromin test in the primary population revealed a rate of 75% for positive reaction. The BCG administration did not appear to have influenced the results. No new leprosy cases were found, a fact indicating the efficiency of public health control exercised by the Dispensario de Lepra de Campinas. Numerous other dermatoses were found.—(From authors' summary).

✓ WILKINSON, F. F., GAGO, J. and SANTABAYA, E. Situación de los convivientes de lepra en relación con el hallazgo del *bacillus proptermaryam*. (Leprosy contacts in relation with the finding of *bacillus proptermaryam*.) *Leprológia* (Buenos Aires) **8** (1963) 155-159.

A new bacillus, recently described by Wilkinson *et al.* in leprosy patients, and known as *bacillus proptermaryam*, was found also in 45% of leprosy contacts in the Dispensario Central de Dermatología, in 30% of infantile contacts, and in 0% of children of leprosy patients separated from their parents since birth. This bacillus was not found in dermatoses other than leprosy.—E. D. L. JONQUIÈRES.

✓ MALHOTRA, B. L. Leprosy in Malaya. *Leprosy Rev.* **35** (1964) 183-191.

A good opportunity exists in Malaya for national leprosy control. Institutional care is of the best available; it is felt that it has reached the saturation stage. Field work has not been established. Thus leprosy has remained more of a medical than health problem. Because of the absence of any health education on leprosy, an extensive gulf exists between the patient and the public, thus creating problems of rehabilitation. The main rehabilitation performed by the Government is employment of a few discharged patients in leprosy institutions. Although the objective of the Malayan Leprosy Relief Association is to rehabilitate, time is needed; it may be years before the discharged patients can expect any benefits. The apathy of medical officers toward service in the leprosaria is evidenced by the fact that since establishment of the leprosaria, barring 2-3

local officers, all have been outsiders on contract or otherwise. The World Health Organisation has offered a fellowship for six months, but there has been no applicant from the medical officers in the Federation.—(From author's abstract.)

✓ BLANC, M. V. J. Integration of leprosy control at the onset of mass campaign in Indonesia. *Leprosy Rev.* **35** (1964) 205-209.

AN attempt at integration at the onset of a leprosy control mass campaign has been tried in Indonesia, partly because it fitted with certain circumstances, such as low leprosy endemicity, economic difficulties, and scarcity of qualified personnel, and also because the method used has many advantages in the organization of a large program of leprosy control. It permits better use of existing personnel, institutions and equipment, fight against prejudices attached to leprosy in the public, faster expansion of the program, etc. Integration is effective at the levels of province, 'regency' region of approximately 400,000 people, and subdistrict. A specialized institute and personnel are necessary. Specialized personnel is posted at key-levels for a correct execution of the program, for close technical cooperation with existing public health services.—(From author's summary.)

✓ BLANC, M. V. J. An experiment of integration in leprosy control at the onset: the area of Menganti. *Leprosy Rev.* **35** (1964) 211-216.

AN experiment in an integrated leprosy control program in the area of Menganti (Indonesia, province of East Java) proved that efficient case-finding is possible through use of nonspecialized paramedical personnel, and that treatment given through the existing medical facilities, under the supervision of a specialized nurse, can give very good results. This experiment of integration at the onset of a leprosy mass campaign is an example of what can be done and achieved in other parts of the country for effective control of the disease.—(From author's abstract.)

✓ WILLIAMS, E. H. Report on five years of operation of a leprosy control scheme in the West Nile District of Uganda. *Leprosy Rev.* **35** (1964) 219-222.

IN the latter half of 1958 the West Nile District Council introduced regulations for the control of leprosy, requiring attendance for examination and diagnosis, and treatment in proven cases. Provisions for segregation were made in so-called "infectious" cases. Penalties were assessed for nonattendance. The program was backed up by a large leprosarium at Kuluva, a small one at Wandu and 3 outpatient clinics. An immediate potential coverage of nine-tenths of the population of 400,000 was effected. Gratifying results followed at first, but after three years the campaign lost some of its impetus. A substantial number of temporary and permanent discharges occurred, chiefly among tuberculoid cases, and the relapse rate was low. Unfortunately a relatively high rate of absenteeism developed among lepromatous cases. The main reasons seemed to be (a) slow improvement in this type of case and (b) a tendency toward ostracism of the patients, with resultant resistance on their part to the discipline involved.—E. R. LONG.

✓ LAVIRON, P. A. Les campagnes de masse et leurs difficultés dans la lutte antilépreuse en Afrique noire. (Mass campaigns and their difficulties in the antileprosy fight in Negro Africa.) *Acta Leprol.* No. 19 (1964) 11-20.

THE new drugs against leprosy and the facilities for their administration do not seem to resolve the problem of leprosy control, particularly in mass campaigns. Independence has often led populations to believe they can either accept or refuse the sanitary measures taken to fight against endemics. As a result, the frequency of mass control programs is small and even decreasing, so that, as far as leprosy is concerned, less than 35% of patients are correctly and regularly treated. In the few places where sanitary discipline exists, however, the results are excellent. The numerous difficulties pertaining to mass campaigns in rural countries are made even more crucial by the relatively low

efficiency of local staffs. To obtain a quicker bacteriologic sterilization, it would be necessary to improve the efficacy of the drugs. But one must never forget that results depend essentially on early diagnosis. The author believes that reinforcement of mass campaigns by mobile teams is the only way to bring about a regression of the disease in rural countries.—AUTHOR'S SUMMARY.

HARGRAVE, J. C. and MARION, REV. MOTHER. Leprotic involvement of multiple peripheral nerves in the absence of skin lesions. *Leprosy Rev.* **35** (1964) 78-82.

The case is reported of a 4 year old male child diagnosed as leprotic, who had a much enlarged left ulnar nerve and wasting of the small muscles of the left hand. DDS treatment was irregular and ineffective. Numerous other peripheral nerves became grossly enlarged. In the article they are listed in detail. A course of Prednisone at a dosage level of 5 mgm. t.d.s. (later reduced) led to reduction in size of most of the involved nerves. The relationship to therapy is cited only because of its possible future value, since diminishing size of the nerves was considered as of uncertain significance in a single isolated case.—E. R. LONG.

HENRY, D. E. A new and simplified technique of treating acute neuritis in leprosy, using ethyl chloride spray. *Leprosy Rev.* **35** (1964) 103-105.

The pathology and treatment of acute neuritis in leprosy are discussed. A new technic of treating the neuritis by ethyl chloride spray on the skin over the nerves is described. It was used in 25 patients and appeared beneficial in 23. Cooling agents may be of more benefit than has previously been supposed.—(From author's summary.)

BUKER, R. S. Importance of anaesthesia in a leprosy control programme. *Leprosy Rev.* **35** (1964) 199-204.

In the earliest invasion of the body by *M. leprae* nerve tissue is first selected. The natural symptoms that develop are paresthesias and anesthesia to light touch. This is, in fact, what happens, as shown by examination of hundreds of contacts of leprosy patients who have not developed obvious macules, infiltration, or early paralysis. The test is simple; proficiency is acquired rapidly by lay workers. It can be performed in surveys of control programs without consuming undue time. With anesthesia the patient has leprosy; without it he does not.—(From author's summary.)

FREITAS JULIAO, O. and ROTBERG, A. A comprometimento neurológico na lepra. (Neural involvement in leprosy.) *Rev. brasileira Leprol.* **31** (1963) 5-33.

The pathogenetic action of *M. leprae* is due to its gradual invasion of the connective tissue and to the extreme diversity in type, intensity and extension of the reaction opposed by the host. From the presumed dermal site of implantation, the microorganism slowly reaches the contiguous nerve branches and nerve-endings; these early lesions are responsible for the early clinical signs and symptoms, such as changes of sweating, vasomotor and pilomotor reflexes, of hair-growth and pigmentation, and disturbances of the cutaneous sensations of temperature, pain and touch. Hypochromic and/or erythematous macules, with hair loss, anhydrosis, nonresponsive to vasomotor stimuli, are often observed; however, the injuries of the peripheral nerve-fibers may develop with a minimum or even absence of dermatologic changes.

The lesions may also gradually and centripetally invade the connective tissue of the nervous trunks ("ascending neuritis"); hematogenous bacterial emboli infecting the nerves have been admitted by some authors. Neural leprosy is, therefore, essentially a neuritis, with involvement of the trunks and/or the peripheral nerve branches.

The early microscopic changes are a lympho-histiocytic inflammation, which may progress, according to host resistance, to a lepromatous, tuberculoid, or dimorphous ("borderline") infiltrate. Acute and subacute reactions may suddenly aggravate previous neural symptoms or even be the cause of their beginning.

Two types, lepromatous and tuberculoid, and two groups, indeterminate (initial) and

dimorphous ("borderline"), are the present classes of the disease, based on biologic concepts. Neural localizations, once the main element for classification, now represent only factors for further subdivision of all these primary classes.

The neurologic picture of leprosy is composed by sensory, motor, trophic and neurovegetative disturbances, usually accompanied by hypertrophy of peripheral nerves. Varied grouping of symptoms and signs leads to different clinical forms. Diagnosis is based on clinical and laboratory data.

Among clinical manifestations, attention is called in the article to the variable character of skin lesions, striking neurologic changes, including various anesthetic elements and paralyses, vasomotor changes and deformities. Laboratory data and general considerations of therapy are discussed.—(From authors' summary.)

✓ TERCENCIO DE LAS AGUAS, J. and OLIETE BENIMEL, J. Un caso de intensa neuritis hipertrofica del mediano. (A case of intense hypertrophic neuritis of the median nerve.) *Acta Leprol.* No. 13 (1963) 47-54.

The authors report a case of lepromatous leprosy in a 28 year old male patient with severe pain in the forearm clinically, and massive hypertrophy of the median nerve, complicated by cutaneous swelling, which in their experience is unusual. Treatment for five months with vitamins B₁ and B₂, in doses from 100-500 mgm., and corticosteroids, caused little improvement. Therefore the nerve was incised under general anesthesia. It was found to measure 1.5 cm. in diameter. A strangulation of the nerve was encountered at the level of the annular carpal ligament which was believed to be the cause of the intense pain and edema of the nerve. Pain ceased immediately on surgical relief of the strangulation. The swelling of nerve and skin disappeared within a few days. Eleven days after the operation a lepra reaction recurred which was attributed to the surgical stress. No median nerve symptoms occurred during this episode.—E. R. LONG.

✓ TERCENCIO DE LAS AGUAS, J. Lesiones osteo-articulares de la lepra. (Osteoarticular lesions in leprosy.) *Rev. Leprol. Fontilles* 6 (1964) 9-25.

Osteoarticular lesions are remarkably frequent in leprosy. Among 270 patients, composed of 183 males and 87 females, 88% displayed alterations, usually multiple. Three types of lesion were distinguished. (a) *Specific osteopathies*. These are caused by the direct action of the leprosy bacillus on bone with production of a typical lepromatous granuloma. This type was responsible for only 8% of cases in the total material observed. It was characterized by osteoclasia or cyst formation. It occurred principally in the meta-epiphyseal zones of the fingers in patients with advanced lepromatous disease and frequent reactional episodes. (b) *Neurotrophic osteopathies*. This constitutes the largest group of osseous lesions. Aeroosteolysis proved most frequent; 88% of the patients displayed multiple lesions in the hands and especially the feet. It is an early lesion, appearing in a form distal and progressive in the phalanges of the feet, and later in the hands. Grave functional changes result. Other lesions include osteoarthritis, especially metatarso-phalangeal and interphalangeal lesions and atrophy of the anterior nasal spine. (c) *Infectious osteopathy*. The most frequent lesion in this category is periostitis of the tibia and fibula, associated with ulceration in the region and trophic lesions of the soft parts, together with osteomyelitis of the bones of the feet secondary to perforating ulcers of the tibia and fibula. In advanced stages of the disease, in negative and "burnt-out" cases, resistant to treatment, there are extensive combined osseous lesions of neurotrophic and infectious etiology, and intense osteoporosis, which poses difficult orthopedic problems.

The sulfones are effective in treating lepromatous lesions, but in the large remainder of lesions they appear to be practically useless. Prophylaxis is the principal factor in the treatment of leprotic osteopathies, carried out by sulfone treatment in early phases of the disease, to obviate neural sequelae that do not yield to this treatment, and by avoidance of traumatic injuries, intensive care of the extremities, especially the feet, avoidance of burns, appropriate footwear, and physiotherapy.

If the lesions are advanced and progressive, the appropriate treatment is surgical, with repairs designed to prevent extensive and mutilating procedures at a later date. Osseous leprosy is of great importance, because of its frequency and sequelae. It may be the greatest obstacle in social rehabilitation of the patient.—(From author's summary.)

✓ CAVE, L., BASSET, A., MENYE, P. and FAYE, I. Considérations radiologiques et pathogéniques sur les lésions artérielles dans la lèpre. A propos de 8 artériographies. (Radiologic and pathogenetic studies on arterial lesions in leprosy. 8 arteriographies.) Bull. Soc. Méd. Afrique Noire Langue Française (Dakar) **8** (1963) 67-74.

The authors believe arterial studies merit inclusion routinely in all types of leprosy lesions; particularly osseous. They carried out arteriography of the hands and feet in 3 patients with leprosy and 1 with ainhum. An authentic arteritis was found in each, which seemed logically to be incriminated as a cause of trophic bone lesions. It is suggested that more frequent attention should be paid to vascular lesions in leprosy, and perhaps more systematic use of various treatments of arteritis.—(From abstract by J. R. Innes, *Trop. Dis. Bull.* **61** (1964) 400.)

TORRENT GUASP, F. Anemia hanseniana. (Anemia in leprosy.) Rev. Leprol. Fontilles **6** (1964) 27-30.

Anemia of normochromic type, with an average of 3,000,000 erythrocytes per cu. mm., is commonly seen in the symptomatologic picture of leprosy. Its cause has been generally considered to be an inhibition of production in the bone marrow rather than an increased erythrocyte destruction. The role of sulfone toxicity is generally accepted, but there is reason to believe that specific or nonspecific factors in the disease itself play a role.

The author reviews 100 clinical histories each of male and female leprosy patients. In 61 cases in males and 51 in females there was neither anemia nor albuminuria. In the remainder of cases in each sex, albuminuria was noted. In the majority of these there was anemia. In a much smaller number of cases there was albuminuria without anemia. In a total of 88 patients with albuminuria 78.4% were anemic, a fact indicating a renal element in the anemia.—E. R. LONG.

✓ CHATTERJEE, S. and CHAUDHURY, D. S. Hypopigmented patches in fundus in leprosy. Leprosy Rev. **35** (1964) 88-90.

In a recent survey of 250 leprosy patients an unusual type of abnormality in the fundus was detected. Out of 50 examined with the ophthalmoscope four showed the abnormality and in both eyes. Two were resolved lepromatous cases and the remaining two retrogressed tuberculoid cases. In the absence of histopathologic examination the true nature of this condition remains unknown. From the appearance and by clinical elimination the disease appears to be hypopigmented spots in the choroid. Although the appearance is somewhat alarming, it is in fact a benign condition not affecting vision at all. The rest of the eye did not have any other leprotic lesion as well. As the spots are merely a matter of color contrast, it is pronounced and easily detected in the fundi of dark Africans.—(From authors' summary.)

✓ MARINI, V. and MARINI, L. Trial treatment groups in lepromatous leprosy. A preliminary note. Acta Leprol. No. 17 & 18 (1964) 41-50.

Systematic chemotherapeutic trials at the Ankafu Leprosarium in Ghana, carried out over a period of several months on groups of 20-25 patients each, have led to these conclusions: (a) periodic assessment of progress in the bacteriologic index in a homogeneous group of patients is one of the most objective ways of evaluating drugs, especially where blind trials and periodic biopsies are not possible; (b) treatment with Ciba 1906, sulfamethoxypyrazine, and the latter plus sodium-ethylthiosulfate proved superior to treatment of "controls" with DDS and Etisul; (c) sulfamethoxypyrazine did not differ

significantly in its action from Ciba 1906, but the combination of that drug with sodium-ethylthiosulfate was more effective than Ciba 1906.—(From authors' summary.)

✓ BROWNE, S. G. Polysensitivity to anti-leprosy drugs. *Leprosy Rev.* **35** (1964) 165-167.

In 13 adults under treatment for leprosy, dapsone-induced fixed eruptions underwent exacerbation when the patients were given other sulfones, or other antileprosy drugs unrelated chemically to the sulfones. Some were also sensitive to sulfonamides, and three were sensitive also to antihistaminics and barbiturates.—AUTHOR'S ABSTRACT.

✓ GOKHALE, B. B., KOTNIS, M. G., KASBEKAR, P. V. and MARATHE, S. V. Leprotic reactions and anabolic and anti-diabetic drugs. *Leprosy Rev.* **35** (1964) 91-96.

One of the distressing phases of lepromatous leprosy is the lepra reaction. Some unfortunate patients get these bouts repeatedly and some others are almost continuously in reaction. Although relief can be given with treatment, temporary and repeated episodes of the reactionary phase progressively push the patients down hill. Lepromatous leprosy being a systemic disease, *M. leprae* is widely disseminated throughout the body. With such generalization of the disease there is widespread infiltration of the skin, liver, testes, etc. In such cases, clinically hypoproteinemia and anemia are evident. Patients complain of pains and aches in the bones and joints, because during these reactions the adverse effect of leprosy on bones is at its worst. Anabolic agents (Anapolon, Durabolin) have been tried therapeutically along with Rastinon (oral antidiabetic agent) in cases of lepromatous leprosy. An over-all improvement in body weight, erythrocyte sedimentation rate, and hemoglobin percentage has been observed. In two cases recalcification of bones and arrest of the process of osteoporosis was noted.—(From authors' summary.)

✓ MARINI, V. I sulfamidici a lunga azione nel trattamento della lebbra. Rassegna bibliografica. (Long-acting sulfamides in the treatment of leprosy. Bibliographic review.) *Acta Leprol.* No. 17 & 18 (1964) 51-64.

General experience with several long-acting sulfamides is reviewed. All of various preparations studied were well tolerated. Sulfaphenazole appeared of little value in the therapy of leprosy. Preparations of RO 4-4393, sulfadimethoxin, sulfamethoxypyrazine, sulfamethoxypyrazine, and acetyl-sulfamethopyrazine have been shown to be efficacious in both tuberculoid and lepromatous forms. It is commonly held that the sulfamides may be useful in cases of frequent lepra reaction, and cases where the sulfones appear to be without effect. Long-acting sulfamides have given promising results when combined with other antileprosy drugs.—(From author's summary.)

✓ TERCENIO DE LAS AGUAS, J. and GUILLÉN PRATS, J. El difosfato de cloroquina en el tratamiento de las leproreacciones. (Chloroquine diphosphate in the treatment of lepra reactions.) *Acta Leprol.* No. 13 (1963) 30-46.

The authors consider lepra reactions the principal obstacle to successful treatment of leprosy, leading, as they do, to severe visceral lesions, amyloidosis, and irreversible cachexia. In their experience only 10% of lepromatous patients escape such reactions completely, and in some 40% a continuing "reactional status" is maintained, with frequent acute episodes over a period of years and periodic interruption of specific treatment. Thirty cases are described, in which lepromatous patients were treated with chloroquine diphosphate in an initial daily dose of 750 mgm. In 25 of them (83.3%) the treatment (associated in 3 cases with the monosemicarbazone chromoxine), appeared effective, resulting in disappearance of reactional manifestations within 5 days in 36%, 6-10 days in 56%, and periods longer than 10 days in 8%. The treatment was without effect in 5 cases. Comparison of results with those obtained with corticosteroid therapy indicated a favorable tolerance and effectiveness with the chloroquine.—(From authors' summary.)

- ✓ RAMANUJAM, K. Tapazole in the treatment of leprosy. *Leprosy in India* **35** (1963) 3-6.

Treatment is described of 9 cases of lepromatous leprosy with Tapazole, a brand of methimazole, over a period of 24-38 weeks. The results indicated that Tapazole is not an effective antileprosy drug. Attention is called to the possible development of serious complications, such as leucopenia, in its use.—(From author's summary.)

- [ANONYMOUS] Report drug acts against leprosy. *Drug Trade News*, January 18, 1965, pg. 36.

In Pretoria, South Africa, cyclophosphamide has been found to have a beneficial effect in leprosy apparently by inhibiting acute reactions rather than by antibacterial action. A. R. Davison and associates of the Westfort Institution gave doses of 400 to 800 mgm. daily, with and without accompanying dapsone treatment, to 8 patients, with larger doses "given only to those patients receiving dapsone in whom smaller doses had not caused leucopenia," which promptly occurs when the drug is given alone. One patient was "benefited strikingly after four months" while one other showed "clinical improvement." In five others the improvement was no better than with standard treatment, and with one it was actually less. In no patient did the bacterial count change as a result of cyclophosphamide therapy; therapeutic action was said to be the result of inhibition of host reaction to the bacillus. "This decreased reactivity . . . may be of value in preventing or relieving . . . acute swelling, peripheral neuritis, and . . . erythema nodosum."—J. A. ROBERTSEN. (*Ed. note*: The above article from *Drug Trade News* apparently quotes researchers' report in *Lancet*, Nov. 28, 1964.)

- ✓ BROWNE, S. G. Corticosteroids in leprosy. A guide to their systemic use. *Leprosy Rev.* **35** (1964) 157-163.

Among the available adrenal corticosteroids and their synthetic analogs, Prednisolone and betamethasone today hold pride of place in the control of acute exacerbation in lepromatous leprosy and of certain reactional phenomena in tuberculoid leprosy. Despite their recognized drawbacks and serious side-effects, these drugs alone are effective in controlling severe exacerbation and permitting continuation of antileprosy therapy. Detailed advice is given concerning the indications for corticosteroid treatment, the dosages that experience has found to be the best, the advisability and manner of discontinuing such treatment, etc. Brief mention is made of ocular, perineural and intralesional use of hydrocortisone.—AUTHOR'S ABSTRACT.

- ✓ JENNINGS, W. H. Effect of injection of hydrocortisone into nerves thickened by leprosy. *Leprosy Rev.* **35** (1964) 83-85.

Hydrocortisone appears highly efficacious in preventing or curing neural deformities arising in connection with leprosy, the type of leprosy of the patient being immaterial, provided treatment is started early.—AUTHOR'S SUMMARY.

- ✓ BASU, R. N. Abuse of cortisone in leprosy. *Leprosy Rev.* **35** (1964) 217-218.

Cortisone has been invaluable in the treatment of several diseases, including leprosy, but its indiscriminate use in the latter is leading to grave consequences. It has a place in the therapy of borderline and tuberculoid leprosy and erythema nodosum leprosum, but its prolonged use leads to depletion of potassium, retention of sodium, alteration of the blood sugar level and altered protein excretion. It is a mistake to use cortisone in complications of leprosy that may be expected to yield to other remedies.—E. R. LONG.

- ✓ PETTIT, J. H. S. and CHIN, J. Does glucose-6-phosphate dehydrogenase deficiency modify the course of leprosy or its treatment. *Leprosy Rev.* **35** (1964) 149-156.

In a survey of over 1,000 patients with leprosy, 47 cases (4.4%) were found

to have glucose-6-phosphate dehydrogenase deficiency. A controlled clinical study suggests that such a deficiency does not modify the overall response to therapy but may predispose to a greater tendency to leprosy reactions. All patients were receiving 600 to 800 mgm. of sulfone per week and none had a frank hemolytic anemia.—(From authors' summary.)

✓ OPRMOLLA, D. V. A. and MARQUES, A. L. V. Cromomicose e lepra. Apresentação de 2 casos. (Chromomycosis and leprosy. Presentation of 2 cases.) Rev. brasileira Leprol. **31** (1963) 91-96.

Two cases are reported of chromomycosis associated with leprosy. In one of these the fungus causing the disease was isolated; it was identified as *Phialophora pedrosoi*. In commenting on the literature on the subject, on a world-wide basis, and the fact that the disease had not been diagnosed in leprosy research institutes in Brazil, the authors emphasize the need for more careful research to check on the cause of the infrequency of association of the two diseases.—(From authors' summary.)

✓ ANDERSEN, J. G. Foot drop in leprosy. Leprosy Rev. **35** (1964) 41-46.

The tibialis posterior tendon is identified and detached at its insertion. It is withdrawn into an incision on the medial side of the leg, and the distal short fibers are detached from the tendon, which is tunneled in the strictly subcutaneous layer around the tibial border of the tibia in the direction of the base of the V metatarsal bone. This is easily done with a curved blunt tendon tunneller as described by the author. The transposed tendon is looped round the ext. hall. longus tendon and is secured to the tendon of the ext. dig. long. The tendon suture is done under high tension with the foot in dorsiflexion. After skin suture the foot is secured in a below-the-knee plaster of Paris boot with incorporated toe guard. After a few days the patient can be ambulated in a walking cast. After 4 weeks the plaster boot is removed and the foot is maintained in a dorsal slab while active physiotherapy is instituted. The majority of patients will achieve a normal gait in 2 to 3 weeks and they can then be discharged with suitable shoes as prevention against ulceration of the foot. The operation lends itself to simultaneous correction of drop or claw toes. No overaction on the dorsiflexion of toes has been noticed. The method appeared to be a valuable alternative to other methods reported by several investigators since 1957.—(From author's summary.)

✓ NAMASIVAYAN, P. R. Physiotherapy in leprosy. Leprosy in India **35** (1963) 65-73.

Emphasis is laid on education of patients, oil massage, wax packing, exercises and immobilization of fingers, measures that can be applied by leprosy workers with limited training and a minimum of equipment in any village or hamlet. Exercises are indicated by diagrams.—E. R. LONG.

✓ SRINIVASAN, H. Trophic ulcers in leprosy. Leprosy in India **35** (1963) 119-127.

Records of 232 patients with 476 trophic ulcers in 333 feet were analyzed; 90% of the ulcers were found in the forefoot. The region of the proximal phalanx of the big toe, a site that normally does not come into much contact with the ground, was found to be the most common site of ulceration. It is pointed out that ulcers of the ball of the foot occur under proximal phalanges of the toes and not under the metatarsal heads. Statistical analysis, comparing the frequencies of ulcers at the different sites in cases of single and multiple ulcers, shows that one ulcer in the forefoot makes the other non-ulcerated areas more prone to ulceration than before. It is suggested that shifting sites of weight bearing due to the presence of an ulcer would explain this feature. It is also pointed out that preventing an ulcer could then be prophylactic against ulcers elsewhere.—(From author's summary.)

✓ REGINATO, LUIZ E. and BELDA, WALTER. Mucous graft in the median forehead flap for

relining the nose. *Rev. Latino-Americana Cirurg. Plast.* **8** (1964) 119-120. (Portuguese title: Retalho frontal intercilial na restauração do estofo nasal, *ibid.* 115-118.)

An objection to relining the nose by a forehead skin flap as occasionally practiced in reconstruction of the nose in leprosy patients, is the occurrence of an unpleasant smell in the nasal cavity, caused by the secretions of sebaceous and sudoriparous glands in the cutaneous graft. The authors have obviated this by a procedure in which, in addition to the skin flap, a mucous graft is used. A $\frac{2}{3}$ or $\frac{3}{4}$ thickness dermo-epidermic graft is removed from the skin flap and a thick graft of oral mucosa is applied over the raw area. The procedure was used successfully in 5 patients with leprosy and one with leishmaniasis. In the course of three years of postoperative observation no complication was observed. The unpleasant odor, which followed the conventional simpler forehead skin graft, was prevented. Diagrams illustrate the operative procedures—E. R. LONG.

WYSS, T. New method of nose reconstruction. *Leprosy Rev.* **35** (1964) 47-49.

An easy and riskless alloplastic procedure is described for reconstruction of loose leprotic nose deformities with collapse of the septum. This kind of nose deformity will exert only slight mechanical stress on the insert and thus, *soft* alloplastic material (polyethylene) will be tolerated for years. One major advantage is the fact, that even nose deformities with active infiltrations (bacilli++) can be reconstructed without risk of extrusion or infection. For heavily contracted noses with "short skin" this procedure is not adequate; those cases should be operated by complete plasty, i.e., by the method of N. H. Antia.—(From author's summary.)

OLIVETE BENIMELI, J. Tratamiento quirúrgico funcional del lagoftalmo. (Functional surgical treatment of lagophthalmos.) *Rev. Leprol. Fontilles* **6** (1964) 1-8.

The causes of lagophthalmos are reviewed and paralysis of the orbicular muscle is discussed, with illustrations of the anatomy of the temporal muscle. The technic for functional surgical treatment for the relief of lagophthalmos, as practiced at the Sanatorio de Fontilles consists basically in utilizing the motor power of the temporal muscle by mobilizing a small portion and unfolding its aponeurosis. The original must be consulted for technical details. Of several variations of the procedures employed, one proved superior in that no foreign body reaction occurred in the internal angle, and tendon tension was regulated, with complete success in correcting ectropion of the lower lid, and coincident satisfactory movement of the lids. Details of three cases are given.—E. R. LONG.

WHEATE, W. H. Two unusual cases of nerve abscess. *Leprosy Rev.* **35** (1964) 86-87.

Cases of nerve abscess as a complication of leprosy are reported in a 9 year old boy with painful swelling over the right ulnar nerve and early clawing of the right hand, and a 22 year old adult with thickening of the left radial nerve, small abscesses in its course, and wasting and anesthesia in the left thumb and index finger. The boy, who had been under treatment by dapsone, was then treated by incision of the abscess and a combination of thiambutazine and streptohydrazide (later replaced by Solapsone). A short course of Prednisolone was given. After 16 months complete recovery from the claw hand had occurred, presumably mediated by regeneration of nerve fibers that had been destroyed by the abscesses. Similar therapy was effective in the 22 year old patient.—E. R. LONG.

TERENCIO DE LAS AGUAS, J. Epitelioma espinocelular postraumatico en hanseniano. (Post-traumatic prickly cell epithelioma in a leprosy patient.) *Rev. Leprol. Fontilles* **6** (1964) 31-35.

A case is described of orthoplastic prickly cell epithelioma in a patient with lepromatous leprosy. The lesion originated from a sting on the fifth finger of the right hand at the level of the metacarpo-phalangeal articulation, which occurred 35-45 days before the appearance of the epithelioma. It was treated surgically by wide extirpation and graft, seven months after the trauma. Counting this case, 10 such epitheliomas have been observed in patients with leprosy.—E. R. LONG.

✓ BEIGUELMAN, B. Grupos sanguíneos e lepra. (Blood groups in leprosy.) *Rev. brasileira Leprol.* **31** (1963) 34-44.

A group of 1,656 lepromatous and 471 tuberculoid leprosy patients, classified according to racial stock, was investigated with respect to ABO and Rh (D-d) blood groups. A significant, although slight excess, in the O group frequency was found among tuberculoid cases as compared to lepromatous cases, for the two total samples, but not for the racial subsamples. When the O frequency among lepromatous is compared with data taken from the nonleprosy population, no difference appears. The same is not true for tuberculoids, who show again an excess of the O group. Selection of the O group is not so efficient as to cause a disturbance on genetic equilibrium.

No difference was found in gene frequency estimates, when tuberculoid and lepromatous leprosy patients were compared within each racial stock. However, when Brazilian and Italian stocks were pooled for statistical reasons, a significant difference in the gene frequencies of the tuberculoid and the lepromatous samples was found. With respect to Rh negative frequency, no difference between tuberculoid and lepromatous cases was found.

Since, recently, it has been indicated that the antigens of some infecting organisms are serologically similar to blood antigens, it seems interesting to find out if this is not the case also for *M. leprae*.—(From author's summary.)

✓ CONTRERAS RUBIO, F. La histopatología de la lepra. (Histopathology of leprosy.) *Acta Leprol.* No. 14 (1963) 3-36.

The author reviews contradictory opinions on the importance of histologic examination, emphasizes the importance of selection in determining the need for histopathologic examination in individual cases, and proposes certain principles to be observed in utilizing histopathology in the treatment of leprosy. He notes its special significance in the recognition of "indeterminate" leprosy, and the need for histologic confirmation of this clinical diagnosis, as well as notation of trend toward another type of leprotic disease. In analysis of histopathologic findings in tuberculoid leprosy the concept of allergic reaction of the reticulo-endothelial system is to be kept in mind. In lepromatous leprosy, the histologic condition of the epidermis depends in the last analysis on the intensity of the inflammatory process; the different types of visceral lesion are to be considered. On a histologic basis "intermediary" leprosy should be divided into 2 groups: (a) reactive tuberculoid leprosy, and (b) atypical reactive tuberculoid leprosy; visceral lesions are usually present in the former and rare in the latter. In distinguishing indeterminate, tuberculoid, intermediary and lepromatous forms, various factors must be taken into account in the application of histopathology in the diagnosis of leprosy, including reactivation of lepromatous lesions, pseudoexacerbation, vacuolization of histiocyte cells, distinctions among giant cells, the role of connective tissue, and histochemical factors.—(From author's summary.)

✓ SERIAL, A. and GONZALEZ DEL CERRO, S. Estudio histopatológico comparativo de las zonas cutáneas clínicamente respetadas y atacadas en enfermos lepromatosos. (A comparative histopathologic study of clinically spared and involved regions of the skin in lepromatous patients.) *Leprológia* (Buenos Aires) **8** (1963) 169-172.

In 8 lepromatous cases a comparative histopathologic study was made of zones usually unaffected or affected clinically. The following results were noted: (1) Fold of the elbow (a zone usually unaffected): (a) the histopathologic diagnosis was undetermined prelepromatous disease in all 8 cases; (b) in 6 of the 8 cases perineuritis was found; (c) in all 8 patients the Ziehl-Neelsen stain was positive for bacilli. It is to be noted that in 6 patients a great many bacilli were found in spite of the fact that the region was clinically unaffected. (2) Extensor surface of the forearm (a zone usually affected): (a) in all the cases there had been typical and intense lepromatous infiltration; (b) in 4 of them there was neuritis; (c) in all 8 cases the Ziehl-Neelsen stain of the biopsy specimens was positive, and intensively so in the majority.—AUTHORS' SUMMARY.

SCHÜJMAN, S. and CASTAÑÉ DECOUD, A. Valor de la histopatología en la lepra indeterminada. (The value of the histopathology in indeterminate leprosy.) *Leprológia* (Buenos Aires) **8** (1963) 173-174.

In a previous study Castañé Decoud reported that lepromatous infiltration of nerves was less destructive than the tuberculoid form. Perineurium and the neurofibrils are frequently spared in the former and always destroyed in the latter. Seventeen biopsies of indeterminate cases were studied to determine if prognosis can be predicted by the type of infiltration in relation to the eventual polar evolution. The authors' experience led them to believe that the destruction of the perineurium in indeterminate cases is an index of tuberculoid evolution and that perineuritis with a spared perineurium is prelepromatous.—E. D. L. JONQUIÈRES.

MANZI, R., LEFEVRE, H., BARENTIN, E. A. and SARASINO, E. Baciloscopía ácido-alcohol resistente y enfermos residuales. (Acid-fast bacilli in arrested leprosy patients.) *Leprológia* (Buenos Aires) **8** (1963) 160-162.

Acid-fast bacilli were found in a high percentage of patients with arrested leprosy of all clinical types, with negative cutaneous bacilloscopy, on investigating the urinary sediment. The urinary acid-fast bacilli were morphologically identified with *M. leprae*. This surprising finding is being reviewed. All the patients had displayed cutaneous negativity for *M. leprae* for more than two years.—E. D. L. JONQUIÈRES.

CASTAÑÉ DECOUD, A., AÑANOS, V., FRACCHIA, A. and FRACCHIA, R. Estudio de los vasos linfáticos en la lepra lepromatosa. (A study of the lymphatic vessels in lepromatous leprosy.) *Leprológia* (Buenos Aires) **8** (1963) 151-152.

With the technic of Kaindl, Marinheimen, Pfeeger, Thurnher and Schwarz (injection of Evans blue in the first interdigital fold, dissection of lymphatic vessels on the dorsa of the feet and x-ray control by injection of Hypaque in the vessels), three cases of lepromatous leprosy were studied from the histopathologic standpoint. The histologic structure of lymphatic vessels, as was observed in other diseases, is nearly similar to that of veins. Differences between them had been noted by other authors, but in practice they are difficult to prove. Leprosy bacilli are located in the adventitia, in the middle tunic, in the intima, and even in the endothelial cells. This proves without doubt that the bacilli have spread by the lymphatic route. Lepromatous infiltrates thicken the lymphatic wall. This may explain the common edema of the limbs in leprosy.—E. D. L. JONQUIÈRES.

ONDOUA, P., PROST, M. TH., and TRINITE, M. DE LA. Clinical and immunological results obtained with the *Marianum* antigen after more than ten years of therapeutic use. *Leprosy Rev.* **35** (1964) 169-173.

This paper reports on the records of 885 patients treated with the *Marianum* antigen. Of 349 inpatients of the leprosarium, 86.5% received benefit from this therapy

as "arrested" or improved, 12.1% remained stationary, and 1.4% became worse. Concomitant study of the Mitsuda reaction showed that in 349 inpatients a previously negative Mitsuda test became positive in 81.7% (there were originally 159 negative Mitsuda tests) and remains positive to date, and 10% attained a positive but unstable Mitsuda reaction. Most of the conversion of the Mitsuda response was noted after 12 injections of *Marianum* antigen, and remained constant. Of the 536 patients studied, there were 357 with a negative Mitsuda test. These became positive in a percentage of 85.9%. In contrast with the general opinion of leprologists that the first few years of sulfone therapy results only in a low percentage of positive Mitsuda tests, the present study has shown that even in 1½ to 2 years, a high percentage is obtained. This means at the end of the second course of injections of *Marianum* antigen. The authors think that this antigen is a good adjuvant in therapy, which reinforces the resistance of the patient, and permits a better and safer response to chemotherapy. The absence of relapse over the two year period is most striking, and is attested by Miss M. Th. Prost, Directress of St. Michel Leprosarium. From the point of view of prophylaxis, the authors draw attention to the low percentage of infection among permanent contacts, and cite the 92 children who might have been considered to have a high susceptibility to infectious diseases.—AUTHORS' ABSTRACT.

BERGEL, MENY. Transmission de la infección leprosa a animales de laboratorio bajo condiciones dieteticas especiales. (Transmission of leprotic infection to laboratory animals under special dietary conditions.) Acta Leprol. No. 17 & 18 (1964) 33-40.

Rats and white mice, 20 days old from the same litters when possible, were used. Material for inoculation was obtained directly from leprosy patients of lepromatous or borderline type who had not been treated. It was injected immediately or after up to 24 hours of refrigeration, in a triturate in physiologic solution. Intratesticular, footpad, subcutaneous, intravenous and intraperitoneal injections were made. Subcutaneous plantings of slices of lepromas were also made. Semisynthetic diets, supplementing a standard diet, were fed, as follows: (a) low in vitamin E; (b) similar, supplemented with 15% cod liver oil; (c) similar, supplemented with 15% of oil composed of pure ethyl esters of linoleic and linolenic acids in a state of marked oxidative rancidity, with a high content of peroxides and an iodine index of 13; (d) semisynthetic diet with 20% crude linseed oil and added chemotherapeutic drugs, such as DDS and thiourea compounds; (e) standard diet, but with the following substances in the drinking water (distilled): silver nitrate, ferrous gluconate and potassium iodide. Bacterioscopic and histopathologic examinations were made.

In rats on the prooxidant diet inoculation of the testis led to obvious growth of *M. leprae*, quite in contrast to virtual absence of growth in control animals on the standard diet. Especially notable growth occurred in the case of the diet containing 15% cod liver oil and 0.05% silver nitrate in drinking water. The growth was inhibited by DDS. Refrigeration of the inoculation material for 24 hours did not affect its activity.

Similar results followed the inoculation of *M. leprae* in the testes of mice maintained on the prooxidant diet supplemented by silver nitrate. Results were inconstant following intravenous, intraperitoneal and subcutaneous inoculations. Subcutaneous insertion of lepromatous tissue in mice maintained on a prooxidant diet induced the formation of small foreign body granulomas, in which acid-fast bacilli, for the most part homogeneous, were present in great number. On footpad inoculation of mice, results varied with the dose. Little development was seen after large dosage but definite growth, following injection of 0.1 million bacilli or less resulted after 6-9 months, in the formation of well limited granulomas in which acid-fast bacilli were numerous. Footpad growth of bacilli was greater in mice on the prooxidant diet (crude linseed oil plus silver nitrate 1:1,000) than in controls on the standard, unsupplemented diet. Still greater growth was obtained with a prooxidant diet containing 20% linseed oil, with ferrous gluconate (2.5:1,000)

in the drinking water. A still higher, and exuberant growth occurred with the prooxidant diet supplemented by potassium iodide in the drinking water. The semisynthetic diet containing esters of linoleic and linolenic acids in a rancid oxidized state, with a high content of peroxides and an iodine index of 13, inhibited development of *M. leprae* in mouse footpads in a way comparable to that occurring with DDS. In these animals generalized somatic abnormalities were noted. DDS inhibited the development of *M. leprae* in the footpads of mice on the prooxidant diet. Macroscopic changes were not observed in the inoculated animals on any type of diet.—E. R. LONG.

MARTYNOVA, V. A. and BADOVSKAYA. A study of experimental leprous infection in irradiated mice. *J. Microbiol., Epidemiol. & Immunol.* **42** (1964) 82-87.

Infection of irradiated mice with a suspension of *M. leprae* from a human leproma aggravated the course of radiation sickness and caused a significant percentage of deaths in experimental animals, when no fatal outcome was observed in control animals. Reduction of natural animal resistance to leprotic infection, indicated by a noteworthy accumulation of bacilli in the internal organs, occurred soon after irradiation and reached a maximum by the time the acute radiation syndrome developed. However, the results of pathologic-anatomic and bacterioscopic investigations of surviving irradiated and infected mice, as well as of control animals, showed continuous activity of protective mechanisms freeing the mice from pathogens.—(From authors' summary.)

WILKINSON, F. F., GAGO, J. and SANTABAYA, E. Inoculación del *M. leprae* a ratones mestizos. (Inoculation of *M. leprae* in hybrid mice.) *Leprología* (Buenos Aires) **8** (1963) 163-168.

Following the technic of Chatterjee, 195 hybrid mice were inoculated with *M. leprae* from lepromatous patients. Two years and 10 months after the inoculation no reproduction of *M. leprae* was found. The special type of alopecia described by Fernández was noted in 30 animals. Mammary adenocarcinomas, not related to the experiments, developed in some cases. In other cases epitheliomas of Malherbe type were seen. In 40 mice *bacillus propterमारियम* also was found. This and other previous experience lead the authors to support the hypothesis that *M. leprae* has an evolutive cycle, in which *bacillus propterमारियम* may be a link.—E. D. L. JONQUIÈRES.

KHANOLKAR, V. R. Recent advances in our knowledge of *Mycobacterium leprae*. *Indian J. Med. Res.* **52** (1964) 139-150.

A concise review of recent developments of knowledge of the cytology, cultivation, metabolism and antigenic nature of *M. leprae*. Extended reference is made to (1) revelations of the electron microscope on the internal structure of *M. leprae* and the phagocytic "lepra cell;" (2) advances toward culture of *M. leprae* in artificial media and tissue culture (with special note of the ICRC bacillus); (3) transmission experiments; (4) metabolism of *M. leprae*; (5) studies on the antigenic overlap of *M. leprae*, the ICRC bacillus, and other mycobacteria, and (6) recent studies on lepromin. A biography of significant articles is appended.—E. R. LONG.

NAKAMURA, M. Increase of *Myco. lepraemurium* in mouse and rat testicle *in vitro*. *La Lepro* **32** (1963) 152-155. (In Japanese; English summary.)

M. lepraemurium suspension was inoculated into mouse or rat testicles, which were removed from the bodies. These testicles were incubated in various kinds of medium at 37°C. At an appropriate incubation time, the testicles were periodically taken out, and were homogenized with sterile distilled water. The number of the bacilli of *M. lepraemurium* which were contained in each testicle was counted on the stained smear. Among the media tested, the medium that contained pyruvate in Hanks' solution (minus glucose) seemed the most suitable one for increase of the bacilli in the testicle. The maximum

peak of the increase of bacilli was demonstrated on the 7th day of incubation at 37°C. However, it is not yet decided whether the increase of the bacilli is due to true multiplication of the bacilli or not.—AUTHOR'S SUMMARY.

✓ WILDER SMITH, A. Metabolic pathway and its relationship to the biological activity of some tuberculostatic and leprostatic agents. *Leprosy Rev.* **35** (1964) 55-60.

It is generally agreed that the metabolic pathway of a drug and its therapeutic activity are related. Surprises occur, however. If H37Rv is subcultured in the presence of just subliminal doses of isoniazid, resistance to the drug develops rapidly. But if 4-pyridyl-oxadiazolone is tested under the same conditions against H37Rv, the emergence of resistance is much slower. It seemed, therefore, that the two substances are not identical in biologic aspect. In actual experiment 4-pyridyl-oxadiazolone modified the rate of emergence of resistance to isoniazid. Other mixtures, modified the resistance emergence rate of H37Rv to p-amino salicylic acid. One of the great disappointments of recent years in the chemotherapy of leprosy has been the lack of leprostatic activity of isoniazid, which has exceptionally high tuberculostatic activity. The author has shown, however, that isoniazid may be converted into 4 pyridyl-1, 3, 4 oxadiazol-thione (WS 212), by reaction with phosgene. The latter is definitely leprostatic. It thus seems possible to introduce leprostatic properties in tuberculostatics of the hydrazide class by cyclizing the hydrazide group with the corresponding oxadiazolone or oxadiazolthione.—E. R. LONG.

✓ PADMA, M. N. A standard technique of acid-fast staining for *M. leprae* in smears. *Leprosy in India* **35** (1963) 62-64.

The technic described is the one commonly used, in which colorization with the Ziehl-Neelsen stain is carried out for 20 minutes at room temperature. Concentrations of stain and counter-stain, and time of application are indicated precisely. Good results in practice are noted.—E. R. LONG.

✓ HAUVILLIER, O. A. and ACERBO, E. O. Bacteriología acompañante de la lepra y de la llamada lepra residual. (Bacteriology accompanying leprosy, and the so-called residual leprosy.) *Leprológia* (Buenos Aires) **8** (1963) 153-154.

Bacteriologic studies were made on chronic ulcers of leprosy patients and the blood of the same patients. Bacterial associations were common, including *pseudomonas aeruginosa*, *staphylococcus aureus*, *proteus vulgaris* and other proteolytic and putrefactive bacteria. A very high percentage of bacteremia was found in these cases. With Polimyxin and Terramycin ulcers were controlled as a rule. Some alteration in the properdin system seems to be present. These bacteriologic foci can cause anemia, amyloidosis and toxemia. It is important therefore to remove these foci carefully with adequate and deep treatment of ulcers.—E. D. L. JONQUIÈRES.

SHEPARD, C. C. Capreomycin. Activity against experimental infection with *Mycobacterium leprae*. *Science* **146** (1964) 403-404.

✓ Capreomycin, a peptidic antibiotic approximately as active against *M. tuberculosis* in mice as streptomycin, kanamycin, and viomycin, prevented multiplication of *M. leprae* in mouse footpads. Ten mgm. of capreomycin was given subcutaneously each day, starting on the day of infection. Mice from test and untreated control groups were sacrificed for histologic examination at monthly intervals. Acid-fast bacilli appeared after 8 months in the control animals, but after 10 months, no bacilli were present in treated mice. Quantitative bacterioscopy 10 and 14 months after receipt of 5×10^3 acid-fast bacilli showed an average of 7.3 to 8.0×10^5 organisms per mouse in untreated controls, and less than 1.0×10^4 (in fact, none) in animals receiving capreomycin. The activity of capreomycin, demonstrated experimentally, together with relatively low toxicity for humans, suggests therapeutic trial in man.—J. A. ROBERTSEN.