

## CURRENT LITERATURE

*It is intended that the current literature 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.*

SKINSNES, O. K. Leprosy in society. II. The pattern of concept and reaction to leprosy in Oriental antiquity. *Leprosy Rev.* **35** (1964) 106-122.

Chinese medical writings indicate that leprosy was recognized in that country as early as 500-300 BC, and fairly well delineated clinically by the 2d to 3rd centuries AD. Extant records further show that the social reaction to this disease was already set in this early period, and similar to that in present-day South China. This shows that the Bible is not responsible for the creation of the social opprobrium associated with leprosy in many portions of the world, but rather that it is due to some unique intrinsic feature of the disease. This is evident from a comparative reference to the historical reaction to leprosy in Japan and India, and also from some contributions from the Middle East and the Greco-Roman region, all of which seem to be free of Biblical influence. Accordingly, it is suggested that the presence of such a pattern of social reaction to a clinically undelineated or undefined disease may serve as evidence that the disease in question may well have been leprosy.—[From author's summary in *Trop. Dis. Bull.* **61** (1964) 793.]

VOGELSANG, TH. M. A serious sentence passed against the discoverer of the leprosy bacillus (Gerhard Armauer Hansen) in 1880. *Med. Hist.* **7** (1963) 182-186 (news, notes and queries).

In this note the several inoculations made by Danielssen, between 1844 and 1858, of himself and others with leprosy materials are mentioned, before relation of the disastrous results of Hansen's inoculation of the conjunctiva of a patient who had the form of leprosy then called anesthetic (Previously he had inoculated a nodule under the skin of the forearm of another such case with no repercussions—or effect.) The patient was a woman, evidently of unstable temperament, who at first resisted the inoculation but was finally persuaded, and afterward complained bitterly of pain and finally filed suit. The sentence, which is reproduced in full, details all the circumstances, which have not been known before. These include the conclusion of the director general of the Norwegian Health Directorate—to whom the case had been submitted in advance—that in view of the importance of the experiment, and of the fact that while the patient had not given permission she had not directly opposed the procedure, Hansen deserved no more than a serious reprimand. Nevertheless, the court found against Hansen, with costs, and made permanent his dismissal as resident physician at the Bergen Leprosy Hospital, although he continued in his post as medical officer of health for leprosy in Norway.—H. W. W.

LATAPI, F., SAÚL, A. and ORTIZ, Y. La lepra en México. [Leprosy in Mexico.] *Acta Leprológica* **16** (1964) 7-38.

This article is a comprehensive survey of the subject, beginning with the introduction of leprosy by the Spanish four centuries ago (Cortez himself having established the first leprosarium in 1521); and mentioning among the scientific contributions that of Lucio and Alvarado in 1851; the founding in 1930 by Gonzalez Urueña of a Federal service for prophylaxis, the legal background of which was so strict that it was never enforced; the establishment in 1939 of the only existing leprosarium, and of a number of special dispensaries; and the interest taken in leprosy by the Mexican dermatologists which led to recent developments, with most cases treated on an ambulatory basis. This has been done since 1940 at the dermatology centers in Mexico City and in Guadalajara, and the method has spread. The Mexican Association against Leprosy

was founded in 1948, children being a special object of its interests. Since 1956 it has included the publication of *Dermatología*. The government undertook a new and dynamic program in 1960, under which a considerable number of young doctors and nurses have been given special training and sent with Mobile Units for skin diseases into the more endemic regions. Leprosy cases are now being found in much larger numbers and at earlier stages than ever before. The slogan appears to be "Leprosy Control through Dermatology," and this method is recommended for other countries.—H. W. W.

MONTESTRUC, E., with the collaboration of Garein, D., Monrose, M., Papa, F. and Peyronne, G. La lèpre à la Martinique en 1962. [Leprosy in Martinique in 1962.] Arch. Inst. Pasteur de la Martinique **16** (1963) 70-88.

The Institut Pasteur of Martinique, of which the author is the director, has full charge of the leprosy work of the island, including the Marchoux Dispensary, the leprosy service of the Albert-Clarac Hospital, and the leprosy laboratory in the Institute itself. The total number of new patients in 1962 was 52, much the same as in previous years, with a slight diminution of lepromatous cases and an increase of those with the tuberculoid form. Lepromatous leprosy appeared in a child that had been given BCG, apparently without reaction to the vaccine and therefore without defense. Relapse occurred in 13 cases, evidently because of discontinuing treatment too soon. Of the patients admitted to the leprosarium each year since 1953, the numbers of those who still remain are given.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **61** (1964) 396-397.]

INDIA. CENTRAL LEPROSY TEACHING AND RESEARCH INSTITUTE. Annual Report for 1962, 24 pp., Chingleput, Madras State, 1963.

The organization comprises (1) the Institute proper, i.e., the Division of Laboratories, with its laboratories of histopathology, biochemistry, bacteriology, and clinical pathology, (2) the Clinical Division with a full staff and over 900 inpatients, (3) a Division of Epidemiology and Statistics, which has 22 mobile treatment units, and (4) the Silver Jubilee Children's Clinic in Madras. The epidemiology division had examined, with 12 trained paramedical workers, 94% of the population of 378 villages, i.e., 211,927 people, finding 4,212 cases (a prevalence rate of 21 per thousand; lepromatous rate 14%). In the expanded training work courses are held for medical officers and health inspectors (6 weeks), for paramedical workers (6 months) and for various other categories. Drugs tested in the therapeutic investigations include Mehandi seeds (results poor, but work still continuing), Tapazole (not effective), Tebafen (not of great effectiveness), Etisul liquid (not specially useful), Lepsulmin, phenylmethylaniline hydrochloride (not very effective), and several others for neuritis or reactions. DDS has been used for prophylaxis in child contacts without significant results; of 116 children given the drug, 12 have developed the disease, against 15 cases in 110 contacts. Other studies have had to do with the bacteriology and immunology of the disease, and with physical therapy.—[Largely from abstract by J. R. Innes in *Trop. Dis. Bull.* **61** (1964) 397.]

SAUL, A. El decálogo de la leprología moderna. [The decalogue of modern leprology.] *Dermatología* (Mexico) **7** (1963) 146-148.

Ten points which should be borne in mind by everybody concerned with the control of leprosy: (1) Leprosy is a chronic infectious disease, the least contagious of those that are transmissible. (2) It attacks especially the skin and nerves. (3) It can be acquired by close and prolonged contact with an infectious case, especially by those with a predisposition. (4) It is essentially a familial, household disease. (5) There are two fundamental types, (a) tuberculoid, noninfectious and regressive, and (b) lepromatous, infectious and progressive. (6) Leprosy is in general curable, the sulfones (especially DDS) being the medicament of choice. (7) Prophylaxis at present depends upon early treatment of the cases. (8) Leprosaria should be abolished. (9) Prejudice has done more damage than the disease itself. (10) The teaching of modern ideas of leprology should be implemented.—AUTHOR'S ABSTRACT

- ✓ GREBENNIKOV, P. S. and KHARABADJAKHOV, K. K. [Certain aspects of the eradication of leprosy in the endemic region of Rostov-on-Don.] *Voprosy Leprol. i Dermatol.* **18** (1964) 3-10.

The antileprosy activity in the zone served by the clinical and experimental leprosanatorium of Rostov-on-Don has resulted in an absolute and relative diminution of new cases; actually only isolated cases are found. This success is explained by improvement in the living conditions of the population, as well as by the application of the present antileprosy methods on a large scale.—N. TORSUEV.

- ✓ KIRCHHEIMER, W. F. Survey of recent leprosy research. *Publ. Hlth. Rep.* **79** (1964) 481-486.

This is a review article designed to promote better understanding of *Mycobacterium leprae* and its interaction with the host. Other mycobacteria which have certain similar characteristics are: the bacilli of murine leprosy, of buffalo leprosy, of a frog infection reported from Bolivia [to which may be added that of cat leprosy seen in Sidney, Australia]. These organisms are all noncultivable, as was that of Johne's disease of cattle before mycobactin in *M. phlei* was demonstrated. There is doubt in certain quarters that *M. leprae* and its like are wholly dependent upon the intracellular environment, as viruses definitely are, and therefore there is expectation that they can ultimately be cultivated *in vitro*. The idea that there is a lipid-rich outer layer has been revived. [That, however, does not negate demonstrations that the cytoplasmic element is strongly acid-fast.] Other points about the metabolism of those organisms are also touched on. It has recently been reported that the murine bacillus has been maintained in tissue cultures, retaining its infectiousness, for more than 3 years. Also that multiplication of *M. leprae* in rat fibroblasts has been accomplished, although the identity of the bacillus involved cannot definitely be established. It is calculated that the mean generation time of the murine bacillus is 14 days. It can be expected that that of the human bacillus may be as long as 30 days, so that for that microorganism slow-growing tissue-culture is apparently required. [The generation time of the bacilli *in vivo* in the lesions of a reacting case may be only a matter of hours, but it cannot be expected that similar environmental conditions can be produced *in vitro*.] The conditions of attempted experimental transmission to animals are discussed, with special mention of Shepard's success in producing transferable local infection in the footpads of mice; results which have now been amply confirmed. Generalized infection in hybrid mice has been reported by Chatterjee and Rees; the generation time was short. Cytologic studies are mentioned briefly, with no reference to recent electron microscopic studies; the review ends with a brief discussion of resistance and immunity.—H.W.W.

- ✓ LOGINOV, V. K. [The tasks of scientific research in the field of leprosy.] *Vestnik Dermatol. i Venerol.* **37** (1963) 41-45.

The article sets forth briefly the achievements in leprology during recent years, giving principal trends in the development of research in this field. Studies of the microbiology of leprosy are regarded as indicating the leading direction for the near future. Experiments to induce infections in animals should be continued, and also investigations in the fields of immunology, epidemiology and prophylaxis. New medicinal preparations should be elaborated and tested, and the problems of rehabilitation of patients should be studied.—(From author's summary, supplied by N. A. Torsuev.)

- ✓ PICK, F. Sur la reprise de perception des piqures des Réduvidés hématophages au niveau des plaques anesthésiques, observée dans un cas de lèpre tuberculoïde traité exclusivement par l'acide para-amino-salicylique. [Recovery of perception of the stings of a hematophagous insect (*Reduvius* sp.) in the anesthetic plaques of a case of tuberculoid leprosy treated exclusively with PAS.] *Bull. Soc. Path. exot.* **57** (1964) 43-44.

The author reports partial recovery of sensation in the lesions of a tuberculoid case,

1 of 5 that had been treated with PAS. Subjected to the stings of a *Reduvius* hematophage (one of the "assassin bugs") before treatment, none of the patients could perceive the characteristic tingling, but after being treated for 3 months the patient in question could perceive that effect, although anesthesia to the usual methods of examination persisted.—H.W.W.

BROWNE, S. G. Tuberculosis and leprosy. *Tubercle*, London **45** (1964) 56-61.

According to the author's summary, the study of tuberculosis is several years in advance of that of leprosy, including its chemotherapy and our knowledge of its epidemiology. Many points of interest are brought out in this review article, but little that is new except the author's particular point of view about certain features. Among these there is the statement that "acute neurosis may occur in succulent [reactional] lesions, either tuberculoid or lepromatous," which doubtless would have been modified had more space been devoted to that subject.—H.W.W.

HSING, C. T., HAN, F. C. and CHU, B. Y. Sarcoidosis among Chinese. *American Rev. Resp. Dis.* **89** (1964) 917-922.

This report of a well worked-up case in a Chinese woman in Taiwan, is of interest because sarcoidosis supposedly does not occur in the Chinese. This case is said to be probably the first to be recorded. The condition apparently began in 1959 with visual disturbance of one eye, which cleared up after two weeks on prednisolone. Lung affection was found, apparently by chance, during a routine chest survey. Later, there was a single small skin lesion, which, on biopsy, showed typical sarcoid histopathology. Six roentgenograms of the chest show, first (1959) normal findings; then (1962) generalized infiltration, which (1963) had not responded to tuberculosis therapy, but did improve after four weeks of treatment with dexamethazone, although it relapsed after that drug was discontinued. The tuberculin reaction, positive in 1958, was negative on repeated tests later on. There was no disability. [It appears that this case may not have originated in Taiwan, for the patient had been in the United States. It is said that the eye trouble (1959) was complained of after she returned from there, but nothing more is said of that.]—H.W.W.

VANDER PLOEG, D. E. and STAGNONE, J. J. Eyebrow alopecia in secondary syphilis. *Arch. Dermat.* **90** (1964) 172-173.

This is a brief report of two cases seen at a military base, which is of some interest for comparison with the condition seen in leprosy. The alopecia is described (and shown in one picture) as irregular, incomplete, of "moth-eaten" appearance, and of the same degree throughout; it is temporary, with normal regrowth after antisypilis treatment. [Eyebrow alopecia in leprosy begins at the outer ends, and is persistent.]—H.W.W.

RAMU, G. and RAMANUJAM, K. Reactive states in lepromatous leprosy. A study from the clinical and bacteriological aspects. *Leprosy in India* **36** (1964) 3-19.

The authors, at the Leprosy Research Institute at Chingleput, have studied the bouts of lepra reaction exacerbation that occurred in lepromatous leprosy, in 135 patients over a period of 2 years, together with a group of 86 patients who did not develop lepra reaction. The reactions were classed as acute, subacute, and chronic, their proportions in the study group being 79% acute, 13% subacute, and 7% chronic. They were further classified as mild, moderate, and severe. A mild reaction meant fever of intermittent type not exceeding 100°F, with skin lesions more or less confined to face, arms, forearms, or thighs. A moderate reaction meant that the fever, remittent or intermittent, was between 100° and 102°F, with more widespread lesions and moderately severe constitutional symptoms. In severe reactions the temperatures, remittent, rose to above 102°F, and there was a profusion of skin lesions with severe constitutional disturbances. Of the reactions in this group, 20 (15%) were mild, 75 (58%) moderate, and 37 (24%) severe. In 107 acute reactions the onset was sudden; in some there was a polyarthritic or rheumatic onset, while in others the onset was exanthematous, with a profuse maculopapular rash. Skin lesions noted in reactions were exacerbations of preexisting lesions, erythema



nodosum leprosum, and subcutaneous nodules. When pustulation occurred (in only 24 patients), smears showed only *Mycobacterium leprae*, without pyogenic organisms. Various other clinical features were noted, and as sequelae paralytic and nonparalytic deformities. In all cases there was deterioration in the bacteriologic status, whereas in the control group there was bacteriologic improvement under treatment with DDS.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **61** (1964) 676-677.]

RAMANUJAM, K., DHARMENDRA and RAMU, G. Treatment of lepra reaction and some of the special manifestations. *Leprosy in India* **36** (1964) 18-23.

In the treatment of the 135 patients in hospital with lepra reaction that were studied [see preceding item], either potassium antimony tartrate or Camoquin (amodiaquine hydrochloride) was used, in the dosages stated; toxic effects were noted with the former in only 5% of the patients, and with the latter in 36%. The former is regarded as best for the therapeutic approach. Corticosteroids were used as a standby where there was no improvement, and antibiotics were used when skin manifestations (including pustulating lesions), lymphadenitis, and fever failed to improve. There were 7 patients with severe reactions who failed to respond. The authors emphasize that leprosy reaction is a systemic phenomenon in lepromatous leprosy with many outward manifestations, all of which require study *per se*. In the discussion of the use of these drugs, it is pointed out that the corticosteroids are "trump cards" which have to be produced in cases of severe or persistent reaction, agonizing neuritis, or potentially serious eye complications, but that they should not be used indiscriminately or continuously. Slow, careful induction and continued even administration of the sulfone drugs is a safeguard against lepra reaction.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **61** (1964) 658-679.]

MAYER, R. L. Screening of drugs for trial in human leprosy. *Adv. Tuberc. Res.* **13** (1964) 219-304.

This monograph, prepared under a N.I.H. grant when the author was associated with the Leonard Wood Memorial (he died in June 1962), is the most comprehensive publication on the subject extant. The "index" at the outset contains, by count, no less than 75 subject items, of a very wide range. Treated along the way are the *in vitro* and *in vivo* methods of testing drugs, the latter subject beginning with *M. leprae* and *M. lepraemurium* and continuing with all other known pathogenic acid-fast, including *M. bubalorum* and the unidentified mycobacteria. Then follow sections on the biochemistry of the mycobacteria, on drug resistance, and finally on the activities of the various drugs used in chemotherapy. The summary and conclusions, occupying some 6 pages, are repeated in German and French. The bibliography, all items of which include the titles, fills more than 19 pages. This publication must be seen to be appreciated. (For reprints, inquire of the Leonard Wood Memorial, Medical Department, 1832 M Street, N.W., Washington, D.C. 20036.)—H.W.W.

GHOSH, S. and CHAKRABORTY, B. K. Ro 4-4393. A long acting sulfonamide in treatment of leprosy: Preliminary report. *Bull. Calcutta Sch. Trop. Med.* **12** (1964) 33.

With the renewal of interest in the sulfonamides in leprosy, especially the long-acting compounds, the authors undertook a preliminary trial of one of them, Ro 4-4393 (Roche). For the purpose, 10 active, untreated cases were selected, 7 lepromatous and 3 tuberculoid. The drug was administered orally in doses of 1 gm. weekly, and the results after some 6 months of treatment are reported. At that time all of the tuberculoid cases showed marked improvement in the skin lesions, but not those of the nerves. In 6 of the lepromatous cases there was less but nevertheless manifest improvement, with reduction of the average bacillus index from 3.73 to 1.86; in 1 case there had been no improvement. No evidence of intolerance or toxicity was seen, and none of the cases had developed lepra reaction. It was concluded that the drug is of "some value" in leprosy, and further trials were in progress.—H.W.W.

WILKINSON, F. F., MANZI SR. R. O., FALCIANI, S. J., GATTI, J. C., CARDAMA, J. E. and BALINA, L. M. La sulfadimetoxina en el tratamiento de la lepra. Resultados al

año de observación. [Sulfadimethoxin in the treatment of leprosy; results after a year of observation.] *Leprológia* **6** (Buenos Aires) (1964) 192-213.

This is a sequence of a report made the year before, after a six-months trial of this drug (Madribon). A total of 60 cases were now under this treatment, 19 of them for 12 or more months; of that group 15 had been refractory to or intolerant of sulfone treatment. Curves and tables are given of blood concentrations at intervals up to 24 hours after doses of 0.5, 1.0, and 1.5 gm. daily. Numerous charts show the effects of the test drug, DDS, and Promanide, on the bacteriologic status of the cases. Lepra reaction, usually slight, had occurred in 22% of them, but had caused no deterioration. In total, 86% of the cases were improved, most of them much improved, and none had deteriorated. Changes in 7 cases are shown in 18 photographs. The authors hold that this drug should have first rank in leprosy therapy because of its efficacy and tolerance, and because it can be administered during reactions.

[In the same issue there are two reports, one by the same group and the other by Mercu et al., on short-term results (9 months or less) in small groups of cases (14 and 12, respectively), of treatment with *sulfamethoxipyridazine*, which also was regarded favorably.]—H.W.W.

SHORT, E. S. A comparison of Camoquin, P.A.T., Fantorin and salicylates in the treatment of lepra reaction, with special reference to Camoquin. *Leprosy in India* **36** (1964) 24-28.

The author reports on what essentially is a trial of Camoquin in comparison with other therapy for lepra reaction in 327 episodes of lepra reaction in 62 patients, during a two-year period. Because of technical difficulties which prevented a double-blind trial, he believes that the results were inevitably weighted against the potassium antimony tartrate group in favor of the salicylate group, but that the Fantorin (6.4% pentasodium antimony-biscatechol-3:5-disulfonate) and Camoquin groups are fairly comparable. The dosages used are given in detail. Camoquin came first in the more serious reaction cases, and it was of further practical use in desensitizing a patient who had become sensitive to sulfones. It was preferred by most of the reaction patients, and was very effective and acceptable in the outpatient department.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **61** (1964) 67.]

SELVAPANDIYAN, A. J., MENON, M. P. A. and PALANI, N. Use of splints in the treatment of deformed hands in leprosy. *Leprosy in India* **36** (1964) 29-44.

In this very practical article, from the Hand Research Unit, Christian Medical College, Vellore, the splints used are described. These include cylindric splints for the digits designed to correct flexion deformities of the joints; splints used to keep the hand in the functional position; an important "thumb web splint," useful when the muscles that produce opposition and abduction of the thumb are paralyzed (surgical correction of a thumb web contracture needs to be followed by the use of a thumb web splint to prevent recurrence); and finally, what they call "lively splints" for the hands, aimed to prevent stiffness of metacarpophalangeal joints (an elastic traction splint consisting of a circular case made of Cramer wire with elastic rubber traction bands that extend between the proximal phalanges of the fingers and the cross wires of the splint).—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **61** (1964) 680.]

BÜKING, E. P. [On the results of treatment in the leprosarium of Abinsk (1948-1958).] *Voprosy Leprol. i Dermatol.* **18** (1964) 56-59.

This is a report of the results of treatment of 386 patients with the sulfones. These drugs have greatly ameliorated the evolution of the disease, have contributed to rapid bacteriologic negativation, and to increase of reactivity to lepromin. Many patients have left the leprosarium to continue their treatment in the dispensary. The mortality has decreased, and life has been prolonged over that during the time of chaulmoogra therapy. No serious undesirable complications have been seen in the course of sulfone treatment.—N. TORSUEV.

KUNDU, S., GHOSH, S. and SEN GUPTA, P. C. Studies on lipids in "borderline" leprosy. *Bull. Calcutta Sch. Trop. Med.* **12** (1964) 27-29.

In their histologic study of the histology of 30 cases of borderline leprosy (see *THE JOURNAL* **32** (1964) 226), the distribution of lipids in frozen sections was also investigated. Substances staining by the Sudan dyes (III or IV) and Fettrot were regarded as neutral fats, and phospholipids were demonstrated by Baker's acid-hematin method. The histiocytes were stained red in direct proportion to the number and concentration of the bacilli within them; the fat was confined to the bacilli, with no extra-bacillary lipid material in the cytoplasm. When demonstrable bacilli were few, as in the tuberculoid areas, the stain was faint and distributed in red-shaped or granular form. The cytoplasm of some of the Langhans' giant cells was faintly pink after the use of Fettrot. The staining reaction for phospholipids was intense in the histiocytes of lepromatous areas with many bacilli, but not after pyridine extraction; it was weak or absent in the tuberculoid areas. Phospholipids could be demonstrated in the bacilli in smears. The notes in the discussion on similar investigations give evidence of an extensive review of the literature. Of interest (in view of the assumption that the substances revealed by the oil-soluble dyes are all "neutral fats") is the statement of Mitsuda that the fatty substance is of unknown but possibly very complex constitution. The authors conclude that the procedures employed afforded "additional evidence of the 'borderline' nature of the lesion and were useful additions in [their] diagnosis and classification."—H.W.W.

JAYARAJ, A. P. Studies on the distribution of cholinesterases in relation to neuro-histological changes in specialized sensory nerve endings in leprosy skin. *Leprosy Rev.* **35** (1964) 36-40.

This study was made on 20 lesion-free finger pads of leprosy patients, 15 lepromatous and 5 tuberculoid. In early lepromatous leprosy the Meissner's corpuscles appeared to be almost normal and the cholinesterase reaction in them was not diminished; but in advanced cases the cholinesterase reaction was reduced, both in the corpuscles and in the papillary ridges. In tuberculoid leprosy the papillae seemed to be compressed, with resulting destruction of the Meissner's corpuscles. Cholinesterase activity was completely absent in all parts of the skin. It was concluded that cholinesterase activity was found wherever there were nerve endings in the epithelium and it was reduced wherever these endings were damaged.—[From abstract by D. S. Ridley, in *Trop. Dis. Bull.* **61** (1964) 484-495.]

TATARINOV, Y. S. and LOGINOV, V. K. [Immunologic and chemical study of the serum proteins in leprosy by the method of anaphylaxis and desensitization.] *Voprosy Leprol. i Dermatol.* **18** (1964) 24-30.

This study was made on 16 patients, 14 lepromatous and 2 tuberculoid, all of them in the active or progressive phase of the disease. It was found that guinea-pigs sensitized by leprosy serum are completely desensitized by normal human serum. In case of the presence of CPR a complementary desensitization was effected by the cirrhosis serum containing the C-reactive protein. On the basis of these results the authors hold for the existence of an antigenic identity of the normal and leprosy serum proteins.—N. TORSUEV.

TORSUEV, N. A. [On certain microelements of the blood in leprosy.] *Voprosy Leprol. i Dermatol.* **18** (1964) 31-35.

Studying the bloods of 23 leprosy cases by means of spectrochemistry, the author found that their content of copper is much higher than healthy subjects. The concentrations of manganese, aluminum, silicon and titanium are, on the contrary, relatively much lower, being on the average 50% of normal.—AUTHOR'S ABSTRACT.

IVANOVA, N. N. [The ammonia content of the urine of leprosy patients.] *Voprosy Leprol. i Dermatol.* **18** (1964) 36-41.

This study was made in a group of 130 leprosy patients (192 tests) and on 30 controls (33 tests). In lepromatous cases the concentration of ammonia in the 24-hour urine specimen was sometimes increased over normal and sometimes decreased, which is prob-

ably related to alterations of the acid-base equilibrium. A lowered content was especially found in lepromatous cases in an advanced stage of the disease.—N. TORSUEV.

BROWNE, S. G. The liver in leprosy: a review. *West African Med. J.* **13** (1964) 35-41.

From this article, in which the literature is extensively reviewed, one familiar with autopsies on lepromatous cases learns with surprise that lepromatous involvement of the liver has sometimes been denied. It is concluded that that organ may be involved in all varieties of the disease. Consideration is given the possibility that the liver may act as the reservoir of the infection, which is regarded as likely, and to the detoxicating functions of the liver. A number of serologic changes, including false positive reactions for syphilis, are related to the liver involvement.—H.W.W.

SAVINITCH, B. V. [Aortitis in leprosy.] *Voprosy Leprol. i Dermatol.* **18** (1964) 46-48.

A study was made of aortitis in 27 leprosy patients (20 lepromatous, 5 tuberculoid and 2 indeterminate). The lesion consisted of an infiltrate of lymphoid, plasma and epithelioid cells, without bacilli, situated along the vasa vasorum; it was found in advanced, progressive stages of lepromatous leprosy. Also observed was evidence of decollagenization and of collagenization, the latter dominant in the regressive stage of lepromatous leprosy. In tuberculoid cases there was found, along the vasa vasorum, lymphoid infiltrates and collagenization of the tissue. These changes in the aortic wall in all types of leprosy are regarded as nonspecific and provoked by the disintegration of the connective tissue, i.e., its essential substance.—N. TORSUEV.

SAVINITCH, B. V. [The phenomena of regeneration and of compensation in certain parts of the nervous system in leprosy.] *Voprosy Leprol. i Dermatol.* **18** (1964) 49-52.

The intra- and extracardiac and the spinal sympathetic nerve ganglia, and also the spinal cord, have been studied in 27 leprosy cases (20 lepromatous, 5 tuberculoid, and 2 indeterminate). It was found that, besides dystrophic changes in the cells and the nerve fibers, there were processes of regeneration and of compensation brought about by the development of nerve fibers, increase in size of the neurons, the presence of nerve cells with many nuclei and nucleoli, and accumulations of the neuroplasm.—N. TORSUEV.

REYES-JAVIER, P. D. The isopathic phenomenon of Sagher. Preliminary report on leprosy patients in the Philippines. *Leprosy Rev.* **35** (1964) 97-102.

Sagher's isopathic phenomenon is the term applied to the histologic response of leprosy patients to the intradermal injection of some foreign substances, this response being characteristic of the disease itself. In a study of the phenomenon, 67 patients of various types were inoculated with 2 or more of the following substances: lepromin, peptone solution, milk and distilled water. Control injections were given to nonleprosy subjects, and the effect of trauma without injection was observed. Biopsies were made of the test sites. The results confirm earlier work. It was further found that the most consistent and typical isopathic response was that obtained by distilled water. (It is not possible from the information recorded to correlate responses between lepromin and other substances.) Trauma by itself did not elicit an isopathic response. Control patients with dermatoses failed to give a recognizable response, but 2 out of 3 leprosy contacts gave a tuberculoid response to milk or water.—[From abstract by D. S. Ridley in *Trop. Dis. Bull.* **61** (1964) 795.]

NAKAMURA, M. Maintenance of infectivity of *Mycobacterium lepraemurium* for ten years by lyophilization. *Kurume Med. J.* **11** (1964) 46-47.

A brief report of the maintenance of viability and infectivity of a lyophilized suspension of the murine leprosy bacillus for 10 years. To aliquots of the original saline suspension there were added certain proportions of (a) saline, (b) glycerine, (c) bovine serum, or (d) Kirehner's medium. These aliquots were lyophilized in ampules, which were kept in a refrigerator. The infectivity test results after 2 and 3 years have been reported. In the recent 10-year tests all of 5 animals inoculated with the first preparation, and with the others, respectively, 1 of 5, 4 of 5, and 2 of 4, gave positive bacteriologic findings at the sites of inoculation.—H.W.W.



- HARKIN, J. C. Electron microscopic studies of Schwann cells during nerve regeneration. *Sci. Proc. 61st Ann. Meet. American Assoc. Path. & Bact.* 1964, p. 30a (abstract).

Schwann cells undergo remarkable structural transformation in response to injury of associated neurons. The present report examines variations in Schwann cell structure based on electron microscopic observations of sciatic nerves that had been cut and examined at intervals during the period of wallerian degeneration and regeneration. Sciatic nerves from normal adult rats, rabbits and mice served as experimental controls, and sciatic nerves of newborn mice as examples of normal developmental myelination. The Schwann cells in a mature sciatic nerve exhibited scanty cytoplasm which contained few ribosomes and mitochondria. The main part of such a Schwann cell was the spiral extension of the plasma membrane wrapped around the axon to form the myelin sheath. Following wallerian degeneration, axons disappeared and the peripheral nerve stump became a cord of Schwann cells, each with abundant cytoplasm. Surfaces of the hyperplastic Schwann cells were thrown into complex folds. At a later stage of regeneration, axons sank into the Schwann cells and myelin began to form. Simultaneously the schwannian cytoplasm became filled with ribosomes, mitochondria and electron-dense lamellated bodies. Throughout the entire period when new myelin lamellas were produced, Schwann cells contained abundant RNP granules. In intermediate stages of regeneration, axons surrounded by 20 or more myelin membranes might appear completely myelinated. However, if the schwannian cytoplasm contained numerous ribosomes, it was probable that additional myelin wraps still were being produced. Only after myelination was completed did Schwann cells lose most ribosomes and again resemble the cells of normal adult peripheral nerves.—[Author's abstract, verbatim.]

- SERIAL, A., SOTO, E. and PIVA, J. Evolución citológica del peritoneo del cobayo a la inyección de suspensión de bacilos de Hansen. [Cytologic evolution in the guinea-pig peritoneum after injection of leprosy bacilli.] *Leprología* (Buenos Aires) 6 (1961) 160-163.

The inoculum used was a suspension of bacilli purified of tissue detritus by the differential centrifuging method of Fernández and Olmos Castro. In preliminary experiments it was found that phagocytosis by mononuclear cells predominated within 1 day after intraperitoneal injection, this predominance increasing until the 5th day when it was exclusively mononuclear. Short-interval experiments showed phagocytosis by polymorphonuclears only in the first two hours, these cells predominating up to the 6th or 7th hour; mononuclears and polymorphonuclears were in more or less equal proportions until about the 15th hour, after which the mononuclears predominated. In none of the extended series were free bacilli found in the peritoneal fluid, and it was difficult to observe phagocytized bacilli after the 7th day. Cannibalization of polymorphonuclears by monocytes was frequently observed.—H.W.W.

- BERMAN, L. and STULBERG, C. S. Primary cultures of macrophages from normal human peripheral blood. *Lab. Invest.* 11 (1962) 1322-1331.

This article is recommended to anyone interested in the transformation, in tissue cultures which avoid the occurrence of fibroblasts and mitoses, of the lymphocytes and monocytes of the circulating blood into large, phagocytic macrophages. Since it is primarily intended to record the special technic used, and since the findings are basically similar to those of many previous workers, the story of the changes is related briefly, but adequately. The photomicrographs, which are of films grown on coverslips and stained by Giemsa-type dyes, are unusually good and informative. One that shows numerous multinucleated cells, resulting from coalescence of macrophages, called "giant cells" but not of either the Langhans' type nor of foreign-body causation, is especially interesting since what appear to be that form may be seen—if rarely—in leprosy lesions.—H.W.W.

- LINDNER, A., KUTKAM, T. and LINDNER, F. Epithelioid cell granuloma formation with lipid reaction. *Sci. Proc. 61st Ann. Meet. American Assoc. Path. & Bact.* 1964, pp. 38a-39a (abstract).

The epidemiologic and chemical studies carried out by Cummings suggested that loblolly pine pollen might be one of the etiologic factors in sarcoidosis. Lesions simulating sarcoidosis have been produced by injecting whole pine pollen granules and fractions thereof into the spleens of rats. Our aim was to study the mechanism of the formation of epithelioid cell granulomas by pine pollen and its lipid extracts. Loblolly pine pollen (*Pinus taeda*) grown in Georgia was used in these studies. Lipids were extracted from the pollen and injected intravenously or intrasplenically into rats, rabbits and guinea-pigs. Eight months after these injections, epithelioid cell granulomas were found in spleen, liver, lungs and lymph nodes in about 80 per cent of the animals. In these long-term follow-up studies, new information on the pathogenesis of granuloma formation became available. Transmission of the granuloma-producing material of pine pollen appeared to occur from one organ to another with the production of systemic lesions. Granulomas which were acid-fast-negative appeared in the spleens of rats 8 months after injection of the acid-fast-positive material of the pine pollen. Epithelioid cell granulomas were produced in about 80 per cent of 235 animals which received injections of loblolly pine pollen fragments or extracts. No granulomas were found in 136 control animals. The biologically active substance was found in the benzene extract. Chemical analysis of the benzene extract showed the presence of a mixture of a carbohydrate and a vegetable type wax.—[Author's abstract, verbatim.]

MIRANDA, R. N. Lepromino-reação (variabilidade do teste lepromínico, decorrente de várias causas). [Lepromin reaction and its variability arising from various causes.] *Anais Fac. Med. Univ. Paraná* **5** (1962) 153-168.

This article at the outset covers much that is well established about this reaction, although the statement, made in connection with the reactivity of contacts, that "sensitization to the products of the bacillus seems to precede actual known contact" is not entirely clear. The following data are given for supposedly uninfected persons: complete negativity of the recently-born, 30% positivity up to the 2nd year, 40% in children of pre-school age, 50% in the 7-12 years group, 60% in adolescents, and 90% in adults; 10% are of Rotberg's "anergic fringe" which lack his N factor. In experiments with dilutions he has found that 1:150 is most widely applicable. Corticosteroids are inhibitors, and hyaluronidase is an intensifier of the reactions.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **61** (1964) 673.]

FERNANDEZ, J. M. M., MERCAU, A. R., FERNANDEZ PODESTA, T. A., CARBONI, E. A. and AGUERO, H. Reactions elicited in dogs by the antigens *M. leprae*, *M. leprae* murium and *M. tuberculosis*. *Leprológia* (Buenos Aires) **6** (1961) 137-145.

The purpose of this study was to compare the reactions after the first and subsequent injections of the antigens in the same animals. The antigens were: lepromin (Mitsuda-Hayashi), a similar suspension of murine bacilli from infected testicles, and tubercle bacilli from a 1-month culture, 100 million per cc. The dogs at the outset were all negative to tuberculin and Olmos-Castro's leprolin. Second and third tests were made, each about one month after the previous test. The findings may be tabulated as follows:

Antigen	First test		Second test		Third test	
	Early	Late	Early	Late	Early	Late
Human lepromin	Neg.	Pos. <sup>a</sup>	Pos. 4/5	Pos. <sup>b</sup>	Pos.	Pos. <sup>c</sup>
Murine lepromin	Neg.	Pos. <sup>a</sup>	Pos. 4/5	Pos. <sup>c</sup>	Pos.	Pos. <sup>f</sup>
<i>M. tuberculosis</i>	Neg.	Pos. 3/4	Pos. 3/4	Pos. <sup>d</sup>	Pos.	Pos. <sup>e</sup>

<sup>a</sup>Ulceration in 3 of 5 dogs.

<sup>b</sup>Reaction accelerated and intensified in 3 dogs.

<sup>c</sup>Reaction accelerated and intensified, with ulceration in 4 dogs.

<sup>d</sup>Reaction accelerated and intensified in 2 of the 4 dogs.

<sup>e</sup>No increase of intensity of the reactions.

<sup>f</sup>Reactions less pronounced than before.

Noteworthy features are: (1) with the first injections (*a*) the complete lack of tuberculin-

type reactivity, and (b) the production of late reactions in most of the animals, with ulcerations in some given the lepromins; (2) with the second injections, (a) induced early positivity in most of the animals, with (b) a general acceleration and intensification of the late reactions; and (3) with the third injections (given most of the animals), (a) positive early reactions in all, but (b) no further acceleration or intensification, and indeed a reduction with the murine lepromin. Cross reactions in the sensitized animals, both early and late, were in general positive. It is concluded that the ability to modify the allergic status of the organism is a common characteristic of the antigens used, and that the cross-sensitizations observed prove the existence of antigenic substances common to all. [The results of the third injections, especially with the murine lepromin, suggest that if further injections had been given the late reactions might have become of the immune instead of the sensitivity type, as happened in certain of the persons repeatedly injected with human lepromin in as-yet unpublished experiments of the reviewer.]—H.W.W.

MERCAU, A. R. and ALBERTENGO, A. Injertos de piel normal de enfermo tuberculoide a enfermo lepromatoso; intento de transmisión histógena de la alergia cutánea. Comentarios. [Normal skin grafts from a tuberculoid to a lepromatous patient. An attempt at histogenous transmission of cutaneous allergy. Comments.] *Leprologia* (Buenos Aires) **8** (1963) 41-44.

For the purpose of investigating the possibility of transferring the skin reactivity of a tuberculoid patient, thick ( $\frac{3}{4}$ ) skin grafts were transferred to a lepromatous patient. In the 2 trials made, good results were obtained in only 1 instance. When an intradermal injection of leprolin ("protein lepromin"), was made the result was negative, and later on the result with bacillary lepromin was also negative. Subsequent bacteriologic and histologic examinations revealed the presence of bacilli, and a lesion structure corresponding to that of the lepromatous form. In other attempts with different persons, survival of similar grafts was obtained, but in time the grafts lost their capability of reacting to the antigens, and became lepromatous, clinically, histologically and bacteriologically.—[From authors' summary.]

MIRANDA, R. N. Reação de Faria. [Reaction of Faria.] *Publ. Cent. Estud. Leprol.* (Parana) **3** (1963) 5 (editorial).

This is a bid for recognition of J. Lopes de Faria in connection with the cutaneous reaction to normal skin preparations. It is recalled that in 1947 Faria had found that a preparation of normal skin injected intracutaneously into dogs cause a reaction similar to that of Mitsuda; that in 1949 he observed the same thing in a leprosy patient; and that he finally (1953) wrote that a normal skin "extract," made as the Mitsuda antigen is made, produces in at least one-half of tuberculoid cases a late cutaneous reaction of tuberculoid structure that resembles the Mitsuda reaction. Normal skin preparations had not been used before, but de Faria's work constituted a new discovery in the field of experimental pathology. It has been confirmed since 1953 by several investigators, including the author. It is therefore proposed that the phenomenon should be called the "Faria reaction." When perfected, it may have the value of the Mitsuda antigen when lepromin is no longer obtainable.—H.W.W.

SCHOENBERG, M. D., MUMAW, V. R., MOORE, R. D. and WEISBERGER, A. B. Cytoplasmic interaction between macrophages and lymphocytic cells in antibody synthesis. *Science* **143** (1964) 964-965.

The nature of the interaction between macrophages (i.e., those cells of the reticulo-endothelial system in the spleen and lymph nodes that are capable of phagocytosis, sometimes called histiocytes) and cells potentially capable of producing antibody (cells of the lymphocytic series and plasma cells) in the immune response has long been a matter of conjecture. Experiments have been interpreted as indicating that RNA or an RNA-antigen complex may be transferred from antigen-stimulated macrophages to antibody-producing cells. The authors have observed, in rabbit lymph nodes and spleen, clustering

of lymphocytes around macrophages, most frequently in immunized animals, and they have demonstrated by means of electron microscopy the occurrence of a direct connection—probably short-lived—between macrophages and some of the immediately adjacent lymphocytes and plasma cells. This communication between the cells consisted of an opening in the cell walls in contact, in which small cytoplasmic particles of the size of ribosomes could be resolved, but apparently no interchange of any other structures. (An uncommon occurrence in the samples examined.) At least two morphologically different cells interact with the macrophages. There is speculation on this point, there being evidence that the 19S antibody is produced in lymphocytes and the 7S antibody in the plasma cells.—H.W.W.

WEISS, D. W., BONHAG, R. R. and PARK, J. A. Studies on the heterologous immunogenicity of a methanol-insoluble fraction of attenuated tubercle bacilli (BCG). I. Antimicrobial protection. *J. Exper. Med.* **119** (1964) 63-70.

This is a collateral article, of possible interest with respect to an x-fraction of BCG that has unusual capabilities. Certain fractions appear to induce greater and more prolonged resistance than do the intact bacilli to both homologous and heterologous challenges (i.e., to both tuberculosis itself, and to various other pathogens), and also, possibly, than do the well-known adjuvants. This is a formidable problem. The antigen used in the experiments reported was the residue of BCG organisms killed by phenol, washed with water and acetone, and exhaustively extracted with methyl alcohol; this is quite nontoxic. Most of the study is of the heterologous protection produced, tested with infections by *Klebsiella pneumoniae*, which protection can be obtained in white mice by single intraperitoneal injections of as little as 1.0 or 1.5 mgm. of the residue. Immunity was seen with the residue under some circumstances when living BCG was ineffective. The desirability of using certain fractions of the tubercle bacillus as antituberculosis vaccines (because of safety, nonproduction of tuberculin reactivity, and—as found by some workers—superior protective ability), has been discussed [*American Rev. Resp. Dis.* **80** (1959) 340, 459 & 676; also, *ibid.*, **82** (1960) 339].—H.W.W.

OGATA, N. Morphologische Untersuchungen der säurefesten Bakterien in ihrem Vermehrungsstadium. [Morphologic investigation of the acid-fast bacteria in their multiplication stage.] *Nagashima Arch. Leprosy* **3** (1964) 6-16.

In general it is believed that the so-called acid-fast bacteria always remain acid-fast. On the other hand there is a view that in their multiplication besides acid-fast, nonacid-fast and granule stages develop. Hence the name mycobacteria as distinguished from bacteria. The author cultivated three kinds of pathogenetic acid-fast—the tubercle bacillus, the leprosy bacillus (*sic*), and the bacillus of rat leprosy (*sic*)—in suitable media, aerobically and anaerobically, and studied each stage of their growth, using the acid-fast and Gram stains. Microscopic studies established that in their life cycle these bacteria have quite different staining properties, ranging from nonacid-fast to acid-fast, and granular. He concludes that in acid-fast bacteria nonacid-fast bacterial forms germinate from granules and that these then change into acid-fast forms in which granules develop. The acid-fast bacteria are thus understood to belong to the class of mycobacteria in the division of bacteria.—[From author's summary.]

NADKARNI, J. S. and COUTINHO, W. G. Studies on suitable media for the cultivation of an acid fast mycobacterium isolated from human lepromatous leprosy. *Indian J. Med. Res.* **52** (1964) 441-452.

This is a further report on the growth habits of the much-investigated ICRC bacilli, now (1963) maintained for more than 5 years in the "condition fluid" (or "modified fluid") of tissue cultures. For the first 6-8 months able to grow only in that medium, they have now been adapted to growth in simpler media. The four strains (referred to as "cases," I, IV, V and X) grown in the modified medium gave different opacity curves, one of them much higher than the others which were fairly similar. Strains I and IV were tested individually on plain Dubos medium (in which the growth was usually poorest), and in Dubos plus various sera, in which they give different curves.



They were unable to grow on Eagle's basal medium with serum supplements, but did grow in that medium modified by the growth in it of human tissue cells. Growth is always slow, reaching a maximum after 3 weeks. It is noted that immunologic tests with *M. leprae* and the ICRC bacilli (report in press) gave identical or comparable results.—H.W.W.

FITE, G. L., WRINKLE, C. K. and LARTIGUE, D. J. Action of organic anhydrides on mycobacteria. *J. Bact.* **83** (1962) 1301-1305.

It was known to Koch that the acid-fastness of mycobacteria is lost when they are pulverized, and since then many chemical agents have been shown to affect that property, which has been attributed to fatty or waxy constituents, to capsular structures, and to lipophilic properties. The authors report the effects of anhydrides of simple organic acids, which do not affect the morphology of the bacilli. Their summary follows: The bacilli of leprosy, murine leprosy, and tuberculosis lose acid-fastness when treated with maleic anhydride, without loss of morphologic integrity. *Mycobacterium lepraemurium* characteristically reacts only with maleic and not other anhydrides. Although the acid-fastness of *M. tuberculosis*, strain H<sub>37</sub>R<sub>v</sub>, is altered by hot water and many hot organic solvents, it is destroyed by maleic anhydride with greater rapidity than that of *M. lepraemurium*. *M. leprae* lies in a position intermediate to the other two in its reactivity. The reaction is probably a diene-anhydride synthesis, which in the case of *M. lepraemurium* may be of the Diels-Alder type.—[Mainly, authors' summary.]

LARTIGUE, D. J. and FITE, G. L. The chemistry of the acid-fast reaction. *J. Histochem. & Cytochem.* **10** (1962) 611-618.

In this report (which cannot be properly abstracted, and must be seen to be appreciated), the authors tell of many substances tested in comparison with phenol, which is an essential ingredient in the solution used in acid-fast staining. Not a few other compounds were found capable of replacing the phenol. Other conclusions indicated in the summary are that protein denaturation is not the primary role of the phenol and that no specific chemical role can be assigned to it, that phenol and fuchsin are not in chemical combination in the stain, and that the phenol behaves primarily by decreasing the solubility of fuchsin in water and by increasing its solubility in the lipids of the bacillus. It is said that the results support Lemanna's theory of acid-fastness [but just what that theory is is not made clear].—H.W.W.

CORCOS, M. G. *Mycobacterium leprae*: A house divided? *Leprosy Rev.* **35** (1964) 61-77.

This paper, which it is impossible to abstract, is a speculative discussion of immunologic relationships in leprosy, illustrated by a study of 2 patients. The author considers tuberculoid and lepromatous responses as two separate entities (although they may be mixed), and he draws some unorthodox conclusions.—[From abstract by D. S. Ridley in *Trop. Dis. Bull.* **61** (1964) 794-795.]

BROWN, L. R., MAY, C. D. and WILLIAMS, S. E. A non-tuberculoid granuloma in cats. *New Zealand Vet. J.* **10** (1962) 7-9.

The authors report the finding, in 9 cats submitted within some two years in the Auckland area, of granulomatous skin lesions that are usually very rich in bacilli (but scanty in 3 of the animals). These bacilli proved noncultivable on Loewenstein's medium, and noninfectious for guinea-pigs. The animals were in good health, with no evidence of generalized systemic disease. In most of them the nodules were single, and after their removal only 1 animal showed recurrence. The essential cell of the lesion was epithelioid (*sic*), with giant cells usually found by fusion of only 3 or 4 of the lesion cells, usually with areas of caseation necrosis; ulceration might or might not be present. Ordinarily the lesion cells were packed with acid-fast bacilli 3-5  $\mu$ m long. This condition does not resemble tuberculosis, apart from which no report of any mycobacterial infection had been found.—H.W.W.

LAWRENCE, W. E. and WICKHAM, N. Cat leprosy: Infection by a bacillus resembling *Mycobacterium lepraemurium*. *Australian Vet. J.* **39** (1963) 390-393.

In the Sydney area cats have occasionally been observed with nodular granulomatous lesions associated with acid-fast bacilli. Sections of the granulomas show epithelioid cells [sic], giant cells, lymphocytes and neutrophils. Acid-fast bacilli are plentiful in these lesions; associated lymph nodes show numerous bacilli in smears, but in sections they are hard to find. Lymph nodes from one such cat submitted for autopsy were made into a suspension, which showed few bacilli. Inoculations were made in 3 young rats and 2 guinea-pigs; cultures made were negative after 8 months of incubation at 37°C. The rats, killed after 7 months, had subcutaneous infiltrates measuring from 0.5 to 2 cm. in diameter at the sites of inoculation; in them the acid-fast were extremely numerous. The epithelioid cells had much more cytoplasm than in the cat lesions, and were of foamy appearance; adjacent cells were often fused. Definite Langhans' giant cells were rare. The lesion was divided into lobules [tubercles] by connective-tissue strands. In the spleen there were minute lesions of microscopic size, all with extremely numerous bacilli. One of the guinea-pigs killed 4 months after inoculation had, at the inoculation site, a small lesion of similar composition but necrotic, in which no bacilli were found; a single bacillus was found in a section of a regional lymph node. Subinoculations of the rat lesions were made in 5 young rats and 2 guinea-pigs; cultures again all remained negative after 7 months. At that time the guinea-pigs had, at the sites of inoculation, caseous lesions in which no bacilli were found. The 5 inoculated rats died after periods of 7 to 13 months with generalized infection. In all cases the skin was affected, with great quantities of bacilli in the lesions; the spleen, liver and adrenals, were massed with lesion lobules, apparently degenerating centrally but packed with bacilli; occasional bacillus-rich lesions were found in such organs as the lungs, heart muscle, kidney, and epididymis, but only bacilli were found in the testes, located in the interstitial tissue. [This description of the lesions is evidently a synthesis of the total findings.] The bacilli adapted to the rat caused minimal lesions or none at all in 3 kittens inoculated. The authors suggest that perhaps the lesser lesions of the first rats may not have been due to incomplete adaptation, but to a delaying effect of a heterograft reaction to the cat tissue introduced. They hold that the organism of cat leprosy "appears to have the properties of *Mycobacterium lepraemurium*." [This is an interesting contribution to the literature of mycobacterial infections. One would like to know if primary cat-to-cat inoculations would have been more successful than the experimental rat-to-cat transfers. The reviewer, to whom the authors kindly sent paraffin blocks of representative lesions, would describe their histopathology in terms quite different from those used.]—H. W. Wade