

CURRENT LITERATURE

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Clinical Science

Welsh, N. H. and Pretorius, M. The ocular signs in leprosy: Results of a survey in a leper institute. *South African Med. J.* 44 (1970) 9-12. (Suppl.).

The most common lesions observed were loss of cilia (in 30% of cases) and paralysis of orbicularis muscles (20%). Sixty-one per cent of all patients were found to have some ocular involvement, but only a low (0.9%) incidence of iris involvement was observed. The geographic differences in eye involvement in leprosy are discussed, noting that the orbicularis involvement observed was much higher than in other surveys, whereas the corneal changes, rather commonly found in many institutions, were seen uncommonly. "Four cases of pannus were seen and 16 cases (7%) showed evidence of old superficial keratitis and scarring." Not pathognomonic of leprosy only 4 were associated with corneal anesthesia and orbicularis palsy. "The influence of systemic antileprotic treatment on the incidence and severity of eye lesions may play a part."—G. L. FITE

Beretti, J. and Cahuzac, G. Les lésions de la lèpre oculaire en Nouvelle-Calédonie. [Ocular lesions of leprosy in New Calédonia.] *Arch. Ophthalm.* 30 (1970) 313-320.

The authors report the results of a statistical inquiry into the frequency of eye involvement in leprosy as observed in the Sanatorium de Ducos near Nouméa. Eye changes were observed in 47% of cases. The most common manifestation was loss of eyebrows, followed in order of frequency by inflammatory changes in the anterior part of the uvea, and corneal changes which were surprisingly mild. Lesions of lens and fundus seem to have been nonspecific. Incidence of these changes is the

same in European or Melanesian patients.—(Translated from authors' summary)

Emiru, V. P. Ocular leprosy in Uganda. *British J. Ophthalm.* 54 (1970) 740-743.

The incidence of the ocular complications of leprosy in Uganda is reported. Iris pearls and subepithelial punctate keratitis were found to be uncommon and this agrees with similar findings in Tanganyika, Ghana and Malawi, but the reason for this regional variation is not known. Complications were rare in young people who had been treated from the early stage of the disease. Moreover, the incidence of blindness, which was reported to be high in other countries before sulfone treatment, was found to be only 1.3%.—AUTHOR'S SUMMARY.

Ticho, U. and Ben Sira, I. Ocular leprosy in Malawi. *British J. Ophthalm.* 54 (1970) 107-112.

In 8,325 Malawi leprosy patients surveyed, 6.3% were found to suffer from eye lesions and only 0.3% were blind. In lepromatous patients eye lesions occur in the later stages of the disease, and in tuberculoid patients at an earlier stage. Lepromatous patients are affected mainly by iridocyclitis and superficial punctate keratitis. Tuberculoid patients suffer mainly from lagophthalmos and corneal anesthesia due to nerve palsy. The low incidence of ocular manifestations is considered to be due in part to the wide use of sulfones; this is especially true in the lepromatous group, in which only 6% had eye lesions while under dapsone treatment. In tuberculoid patients under current treatment eye manifestations were present in 41%. Steroids are highly effective in controlling hypersensitivity reactions of the uvea.—AUTHORS' SUMMARY

Sinkovics, J. G. and Ibanez, M. L. The elusive diagnosis of leprosy. *Postgrad. Med.* **47** (1970) 109-115.

As the incidence of tuberculosis decreased the last 10 years, new cases of leprosy increased. The highest incidence of new cases in the United States was reported in Texas. It may be that with the decline of tuberculosis, the natural ecology of mycobacteria is reversed, and if measures are not taken, the leprosy/tuberculosis ratio may again favor leprosy. In a patient with a lesion of the nasopharynx, the first histologic diagnosis was compatible with rhinoscleroma. Acid-fast stains showed that the lesion was a lepromatous infectious granuloma. In a patient with lipofibrosarcoma of the leg, lepromatous leprosy was not apparent until injury of the amputation stump and probable septicemia with *E. coli* occurred. During treatment with antibiotics, metaraminol and hydrocortisone, livid hemorrhagic skin eruptions appeared and later sloughed off. Acid-fast staining of nasal scrapings and tissue biopsy specimens established the diagnosis of lepromatous leprosy.—AUTHORS' SUMMARY

Mostert, H. v. R. The early diagnosis of leprosy. *Central African J. Med.* **16** (1970) 234-238.

Appreciation of the simple clinical picture is of value in the diagnosis of lepromatous leprosy in its earliest stages, not only in emphasizing the significance of the early erythematous macular rash in this type of leprosy, but also in recognizing the importance of those low-resistant nerve and macular lesions which, if untreated, may pass on to lepromatous leprosy. What applies to Europeans also applies to natives of Central Africa, although it is the author's experience that the latter show a greater degree of resistance to the disease.—AUTHOR'S SUMMARY

Belda, W. Alguns dados sobre a hanseníase no grupo etário 1-5 anos. [Data on leprosy in the 1 to 5-year-old age group.] *Rev. brasileira Leprol.* **36** (1968-69) 47-52.

New cases of leprosy in children less than 6 years of age registered in São Paulo

from 1963 to 1968 numbered 35, 20 female, 15 male. The incidence was rated comparatively low, and benign forms dominated the clinical picture. Control measures of restrictive character are contraindicated.—G. L. FITE

Pimenta, W. P., Tavares de Mello, E. and Prates Campos, J. C. Hanseníase tuberculóide da variedade nodular da infância. [Nodular tuberculoid leprosy of infancy.] *Rev. brasileira Leprol.* **36** (1968-69) 23-29.

A 2-year and 7-month-old girl had been exposed since birth to a heavy case of lepromatous leprosy. The child had 4 nodules on the left upper extremities, the largest 10 × 11 mm. They were firm, painless, and attached to adjoining tissues. Histologically, tuberculoid granulomata without acid-fast bacilli were identified. The lepromin reaction was strongly positive. The lesion increased to a maximum size at 10 weeks duration, regressing to half size in the following 55 days.—G. L. FITE

Souza Campos, N. Condições que determinam a positividade ao Mitsuda. [Factors which determine Mitsuda reaction positivity.] *Rev. brasileira Leprol.* **36** (1968-69) 37-46.

The author provides 6 epidemiologic-clinical groups which may yield positive lepromin tests, and regards the backgrounds significant to understanding the individual case. The first two are those occurring in the family in which there is a case of infectious leprosy, or on the other hand the tuberculoid type. Incidences of positivity are presented here, and additionally in the author's third group, which is complicated by the presence of both tuberculosis and leprosy. BCG provokes the fourth group. The fifth comprises "spontaneous" positivity, or that resulting from previous Mitsuda testing. Finally the author discusses Rotberg's factor "N," the expression of natural or native resistance in the individual which enables him to react positively to lepromin at the first testing, the factor being unrelated to age or other activators.—G. L. FITE

Enna, C. D. and Brand, P. W. Peripheral nerve abscess in leprosy. Report of three cases encountered in dimorphous and lepromatous leprosy. *Leprosy Rev.* **41** (1970) 175-180.

A review of the literature pertaining to peripheral nerve abscess in leprosy is presented. Relevant features indicate that it is rare, occurring most commonly in males and almost exclusively in patients with tuberculoid leprosy; also that it may involve either the peripheral trunk or cutaneous branches which involvement is correlated with definite clinical patterns. Three cases recently encountered at Carville are reported. They are of interest because they occurred in lepromatous and dimorphous cases of leprosy which were complicated by acute ENL reaction. Also, each abscess originated within the trunk of the ulnar nerve and had different features of interest. The principles of surgical management of caseation and abscess are discussed. In view of the infrequent occurrence of this condition fuller reporting of such cases is advocated, for this would aid in providing a better understanding of the entity.—AUTHORS' SUMMARY

Giménez, M. M., Risso, H. I., Moglia, C. A., Ribichini, J. J. and Waisman, R. El bacilo de Hansen en algunas formas de neuritis de lepra tuberculoide. [Bacilli in certain types of neuritis in tuberculoid leprosy.] *Leprologia* **14** (1969) 11-16.

The authors present 4 cases of tuberculoid leprosy, all Mitsuda positive, and all without bacilli in cutaneous lesions. In these cases painful ascending neural lesions developed, in which bacilli were readily demonstrated in granulomatous tissues from the nerves, some with a little caseation, and some groups of organisms as globi. Treatment with sulfones and vitamins A, B₁, B₁₂, and D proved effective. The authors suggest that the hypersensitization in these cases is somehow related to the pathogenesis of these lesions.—G. L. FITE

Furness, M. A. Alterations in sweat response in skin lesions of leprosy. *Leprosy Rev.* **41** (1970) 169-74.

Sweat response and tactile sensibility has been studied by the use of dermometry and strength of tactile stimulus in the skin lesions of 45 leprosy patients. Tuberculoid lesions showed severe impairment to sweating, while the majority of lepromatous macules showed a fairly normal sweat response. The sweat response in borderline leprosy appeared variable. There was a close correlation between alteration in sweat response and impairment of tactile sensibility in these lesions.—AUTHOR'S SUMMARY

Sharma, C. S. G. and Rao, M. K. Preliminary study of inter-current infections in reaction in leprosy. *Antiseptic (Calcutta)* **67** (1970) 525-529.

The authors studied 17 leprosy patients in whom acute reactions occurred in relation to intercurrent infections, ranging from amebiasis and parasitism through urinary tract infections. The leprosy reactions were controlled by administration of drugs specific for the intercurrent disease, and the authors suggest that when leprosy reaction is precipitated by infectious processes specific "antireactional" drugs stabilization of the leprosy itself by antileprosy drugs will not be obtained.—G. L. FITE

Sarcoidosis. *Postgrad. Med. J.* **46** (1970) 465-541.

At the Central Middlesex Hospital (London) a Conference on Sarcoidosis was held 29 September 1969. The *Postgraduate Medical Journal* records the presentations, 17 of them formal, together with many less formal discussions, consuming an entire issue. Although much material would be found only of indirect interest to students leprosy, some articles such as that of Cronin on skin changes in sarcoidosis (with its nice illustrations in color, pages 507-509) deserve recognition. This issue should be found in all leprologists' archives. Rees' "Kveim test in leprosy" is treated separately.—G. L. FITE

Chemotherapy

Convit, J., Browne, S. G., Languillon, J., Pettit, J. H. S., Ramanujam, K., Sagher, F., Sheskin, J., de Souza Lima, L., Tarabini, G., Tolentino, J. G., Waters, M. F. R., Bechelli, L. M. and Martínez Domínguez, V. Therapy of leprosy. *Bull. WHO* 42 (1970) 667-672.

The latest developments and ideas in the therapy for leprosy are discussed, the need for long-term studies being stressed. The therapeutic efficacy and effective dosages of some sulfones (especially diaphenylsulfone), thiambutosine and long-acting sulfonamides such as sulfamethoxine and sulfalene, are considered. The possibilities for two newer drugs, 4,4'-diacetyldiaminodiphenyl sulfone and clofazimine (B.663), both still in the early stages of evaluation, are also described and the potential value of thalidomide in treatment of the lepra reaction is discussed. The authors make a number of recommendations for controlled trials and lines of investigation and, in particular, favor a biochemical approach to the correction of defective host defenses. Diaphenylsulfone is still considered the drug of choice for use in the therapy of leprosy.—AUTHORS' SUMMARY

[This is a "position statement" of a board spectrum panel of experts. The abstract is given, but the original is worth a thoughtful scrutiny.—G. L. FITE]

Sheskin, J. and Sagher, F. Der gegenwärtige Stand der Thalidomid-Behandlung der Lepra und der Leprareaktion. [Present status of thalidomide treatment in leprosy.] *Archiv. f. klin. u. exper. Dermat.* 237 (1970) 312-316.

Thalidomide is effective in treatment of the lepra reaction, but not of leprosy itself. Thalidomide in combination with sulfones makes it possible to treat the patient in reaction. The optimal dose is 400 mg. daily (6 mg./kg. body weight). Resistance to thalidomide has not been observed. Long term steroid therapy patients should begin with full thalidomide dosage and progressive reduction of steroids.—(Extracted from authors' summary)

Hastings, R. C., Trautman, J. R., Enna, C. D. and Jacobson, R. R. Thalidomide in the treatment of erythema nodosum leprosum. *Clin. Pharmacol. & Therapeut.* 11 (1970) 481-487.

Forty-four trials of thalidomide or an identical placebo have been conducted in 22 patients with active lepromatous leprosy and chronic erythema nodosum leprosum (ENL) reactions. Thalidomide is significantly superior to placebo in completely alleviating the two principal signs of ENL, fever and skin lesions. Selected serial laboratory determinations during the study demonstrate an acute anemia occurring in and immediately after ENL and an acute rise in circulating leucocytes with a shift to the left in the differential count. There is an acute increase in both direct and indirect serum bilirubin associated with ENL and a fall in total serum cholesterol. The suggestion is made that ENL has some characteristics of the disseminated intravascular coagulation syndrome. Despite its teratogenic effect, thalidomide is less toxic than corticosteroids and therefore seems to represent a major advance in the management of ENL. Its mechanism of action in ENL is unknown.—AUTHORS' SUMMARY

Hathaway, J. C. Chemotherapeutic trial of combined Capreomycin and Diasone. *Leprosy Rev.* 41 (1970) 181-183.

Because Capreomycin needs to be given almost daily intramuscular injection, its use would not seem to be practicable except in cases that do not respond to sulfones. Capreomycin and Diasone in combination appear to be worthy of further, more extensive trial in cases that have not responded to sulfones. Any ill-effects from this drug combination appear to be minimal.—AUTHOR'S SUMMARY

Hobby, G. L. and Lenert, T. F. The action of rifampin alone and in combination with other antituberculous drugs. *American Rev. Resp. Dis.* 102 (1970) 462-465.

Using conventional microbiologic techniques for enumeration of microbial popula-

tions *in vitro* and the H37R strain of *M. tuberculosis*, the bacteriostatic action of low concentrations of rifampin alone and in combination with subinhibitory amounts of either isoniazid, streptomycin, PAS, or ethambutol was evaluated. The data indicate that in appropriate amounts, any of these 4 antituberculous drugs may increase the effectiveness of rifampin and prevent the emergence of rifampin-resistant cells. The concentrations required to achieve this effect, however, must be selected with care and not far below the minimal inhibitory concentration of the drug in question. Although not clearly established herein, the data suggests that of the four drugs tested, streptomycin may be most effective in preventing emergence of rifampin-resistant mycobacterial cells.—AUTHORS' SUMMARY

[With the emergence of rifampin as a mycobacteriostatic agent, potential application in leprosy may be drawn from studies with tubercle bacilli. This report implies

that perhaps rifampin in leprosy, if it has therapeutic merit, may wisely be studied in conjunction with dapsone, and not separately.—GLF.]

Seabra Santos, H. and Figueiredo Barbosa, A. J. Sulfonemia na lepra. 2. Estudo dos níveis sanguíneos de DDS em doentes tratados com uma suspensão injectável de absorção lenta. [DDS blood levels in patients injected with a new slowly absorbed suspension.] *Rovisco Pais* 9 (1970) 4-10.

The authors compared a 25% suspension of DDS in a mixture of aluminum monostearate and almond oil with a 12.5% suspension in a simple oil suspension. Their mixture proved to be more stable, requiring a smaller volume, yielding painless injections, slower liberation of the active DDS, and a more prolonged therapeutically effective blood level.—G. L. FITE

Surgical Treatment and Surgical Specialties

Manzi, R. O., Marzetti, A. A., Lefevre, H. and Pacin, J. 1. Encuesta de incapacidades físicas por lepra. [Physical complications in leprosy.] (20-24) 2. Síndrome del ciático popliteo externo. [Popliteal—sciatic nerve syndrome.] (25-28) 3. Historia y concepto actual del panadizo analgésico o enfermedad de Morvan. [Analgesic whitlow in Morvan's disease, historical approach.] (29-35) 4. Patología y tratamiento del panadizo analgésico o enfermedad de Morvan. [Analgesic whitlow in Morvan's disease, pathology and treatment.] (36-40) 5. Patología y clínica del tibial posterior. [Posterior tibial nerve problems.] (41-45) Mano-reaccional. [The hand in reactional phases of leprosy.] [46-50] *Leprológia* 14 (1969) 20-50.

This series of 6 articles from the leprosy rehabilitation center under the national public health jurisdiction of Argentina (Centro de Rehabilitación del Enfermo de Lepra) dates from July 1968, and the articles in a general way summarize the inves-

tigations under progress as well as the efforts being made to bring relief to leprosy patients suffering severe handicaps and disabilities. The nature and pathogenesis of changes in the hands and feet are emphasized, with comments on the various types of medical and surgical treatments employed.—G. L. FITE

Ferrar, H., Ganopl, J. and Simonovich, I. Tratamiento quirúrgico de las úlceras del pie en Hansenianos. [Surgical treatment of ulcers of the foot in leprosy.] *Leprológia* 14 (1969) 51-55.

This article presents the results of several surgical procedures employed in resolution of problems of ulceration, with related osteomyelitis, bone absorption and joint injuries. In a 10-year period the most common procedure was resection of a distal metatarsal epiphysis in the presence of plantar ulcers, more than one epiphysis having been removed in a fifth of the cases, with good results in 82% of the cases. Curettage, practiced usually prior to surgical

intervention, was not of itself so effective, but proved valuable in 46 of 76 cases. Disarticulation was effected mostly because of hammer toes and similar deformity, with or without dorsal ulcerations, osteomyelitis and interphalangeal osteoarthritis. Conservatism with the least surgical intervention needed with the rule; results were clearly related to good healing with healthy scar tissue, and absence of recurrences. The writers emphasize the need for protection of anesthetic areas from exposure to trauma, combined with education of the patient. In a brief companion article (pp. 55-58) the same authors report treatment of neuritis of the ulnar nerves by section of fibrous perineurial bands (epineurotomy) to have given the best results, because of the preservation of the vascularization. Neurolysis, with or without transposition, in a small number of cases, was not as beneficial.—G. L. FITE

Söderberg, G. Follow-up of application of plaster-of-paris casts for non-infected plantar ulcers in field conditions. *Leprosy Rev.* 41 (1970) 184-190.

This investigation of the frequency of recurrence of plantar ulcer after the removal of a plaster cast showed that while the overall recurrence rate was 40%, over half (55%) recurred within the first 3 months after removal and 72% did so within 6 months. The recurrence rate was higher (45%) in deformed feet than in "normal"

feet (36%). The importance of preventing development of a first ulcer is emphasized and the prophylactic effect of wearing microcellular rubber shoes is discussed.—AUTHOR'S SUMMARY

Guerrero-Santos, J. Correction of hypertrophied earlobes in leprosy. *Plast. & Reconstr. Surg.* 46 (1970) 381-383.

A technic is presented, with illustrations, for correction of hypertrophy of the earlobe. It avoids the small notch that often remains in the free posterior edge when conventional technics are used.—AUTHOR'S SUMMARY

Miranda, R. P. G. Efeitos da lepra na cavidade oral. [Effects of leprosy in the mouth.] *Publ. Centro Estudos Leprol. (Parana)* 10 (1970) 24-30 (Portuguese and English)

This is a general article reporting the author's experience with dental and oral hygiene problems in leprosy.—G. L. FITE

Van Linge, B. Operatieve Hulp Bij Invaliditeit Door Lepra. [Surgical procedures helpful to the incapacitated leprosy patient.] *Nederl. Tijds. v. Geneesk.* 114 (1970) 1543-1544.

This "Letter" presents the experiences of the writer gained from studies in South India in patients from the Madras area.—G. L. FITE

Pathology

Klingmüller, G. Die Lepra als Thesaurismose. [Leprosy as a storage disease.] *Archiv. f. klin. u. exper. Dermat.* 237 (1970) 316-323.

This brief presentation emphasizes that in leprosy the disease process is significantly determined by the accumulated residues of bacillary products and tissue cells, and that the meaning of fascinating and extraordinary variations in clinical appearance is based on this storage factor. The author supports this concept with electron microscope photographs of bacillary-containing cells.—G. L. FITE

Kawaguchi, Y. The susceptibility to leprosy bacilli of various inbred strains of mice. *La Lepro* 38 (1969) 181-185. (In Japanese, English summary)

Twelve strains of mice were inoculated in foot pads with a strain of *M. leprae* originally isolated by Shepard. No remarkable differences between results in strains of inbred mice were observed, except in three strains. Multiplication of bacilli was much slower in DDD mice. In KK mice the multiplication of bacilli occurred earlier and greater yields were harvested compared with other mouse strains. Earlier

multiplication was also found with strain C57BL/6, but lower net yields of bacilli were obtained.—(From author's summary)

Mansour, S., Mehasen, A. and El-Ariny, A. F. Muscular changes in lepromatous leprosy. *Trans. Roy. Soc. Trop. Med. & Hyg.* **64** (1970) 918-920.

Thirteen patients with lepromatous leprosy showed primary affection of skeletal muscles, with damage to the muscle fibers and activation of cellular infiltration in the form of large and small mononuclears in such fibers. Among the cellular infiltration Virchow cells could be demonstrated, whose population increased in what seemed to be a relatively older lesion. Plenty of leprosy bacilli or acid-fast masses were seen inside these cells. However, free bacilli could be demonstrated in small groups inside muscle fibers. Sarcolemmal nuclei in some areas showed hyperplasia, central migration, and tendency to form rows. However, attempts at regeneration of muscle fibers were noticed at the periphery of some lesions with tendency to basophilia of sarcoplasm and formation of muscle spindle cells. The lesion was inflammatory and could attain a large size, forming a granuloma-like structure. Within the area of intense cellular reaction, small pieces of eosinophilic muscle shreds were noted. These are not chance findings, but could be demonstrated easily in any of the muscle biopsies of the 13 patients, even in those with negative nasal smears for acid-fast bacilli. The 3 cases studied by electromyography showed foci of disintegration pattern conforming to primary muscular affection.—AUTHORS' SUMMARY

Pearson, J. M. H., Rees, R. J. W. and Weddell, A. G. M. *Mycobacterium leprae* in

the striated muscle of patients with leprosy. *Leprosy Rev.* **41** (1970) 155-166.

These studies were initiated by the finding that when mice were infected with *M. leprae*, striated muscle was the first tissue to be affected. Biopsies of striated muscle from leprosy patients showed the presence of *M. leprae* in 16 out of 20 biopsies from lepromatous cases, 3 out of 4 borderline, and 5 out of 9 tuberculoid cases; in most cases the bacilli lay chiefly within muscle fibers. Bacillary counts performed on homogenates of 22 skin and muscle biopsies (13 lepromatous, 3 borderline and 6 tuberculoid) showed that the concentration of bacilli in lepromatous cases was from 100 to 1,000 times greater in skin than in muscle, but that in this group of treated patients a higher proportion of muscle bacilli were solid staining. In tuberculoid leprosy the total number of bacilli may be greater in muscle than in skin. Muscle involvement in human leprosy may precede the appearance of skin lesions and could also play a significant part in the development of relapse and drug resistance.—AUTHORS' SUMMARY

Job, C. K. Lysosomal activity of macrophages in leprosy. *Arch. Path.* **90** (1970) 547-552.

The lysosomal activity of macrophages in the lesions of 20 patients with lepromatous leprosy and 4 patients with tuberculoid leprosy was studied, using histochemical methods. Acid phosphatase activity was found to be increased in lesions from both types of the disease. The ineffective role of lysosomes in bacteriocidal and bacteriolytic activity of macrophages in lepromatous leprosy lesions is pointed out and is discussed.—AUTHOR'S SUMMARY

Bacteriology and Immunology

Hanks, J. H., Abe, M., Nakayama, T., Bechelli, L. M. and Martínez Domínguez, V. Studies toward the standardization of lepromin. *Bull. WHO* **42** (1970) 703-709.

Because of the wide range of concentrations of *M. leprae* in existing lepromins the

authors studied methods of producing a standardizable lepromin containing 160 million bacilli/ml. The effects of using different dilutions of lepromin on the incidence of false-positive reactions were also studied. Progress reported includes a convenient method for preparing large batches

of nonsedimenting lepromin, which is directly suitable for microscopic counting of *M. leprae* cells; and a validation of current methods for microscopic enumeration of *M. leprae*. Skin tests with diluted lepromins have demonstrated that dilutions up to 1:16 increase progressively the ability to distinguish between lepromatous and tuberculoid leprosy. This work has provided further evidence that 20 million bacilli/ml. (a 1:8 dilution of the initial lepromin) should produce adequate Mitsuda reactions in general populations, provided that 3 mm. reactions are taken as the criterion for 1+ positivity. The net effect of these findings is equivalent to expanding the world supply of lepromin by 8 times. Recommendations for further research are proposed.—AUTHORS' SUMMARY

Oliveira de Almeida, J. Serology in leprosy. Bull. WHO 42 (1970) 673-702.

A critical survey of the literature on serology in leprosy has shown that sera taken from lepromatous patients display some striking differences in comparison with sera from tuberculoid patients. The tests most frequently employed were complement-fixation, hemagglutination, electrophoresis, precipitation and immunofluorescence, together with a variety of antigens not only from lepromas but also from *M. tuberculosis* and other actinomycetales. With the exception of the Rubino test, all these serologic tests are lacking in specificity for leprosy since leprosy sera have a broad range of reactivity with different antigens, including those employed in the serologic diagnosis of syphilis. Some features of the leprosy sera could be related to a hypersensitivity state involving circulating immune complexes, low levels of complement and the presence of antibodies similar to those found in sera from patients with autoimmune diseases.—AUTHOR'S SUMMARY

[It should be added that this is a useful detailed review of the topic, which includes an elegant bibliography of 300 or more citations.—G.L.F.]

Levy, L. Death of *Mycobacterium leprae* in mice, and the additional effect of

dapsone administration. Proc. Soc. Exper. Biol. & Med. 135 (1970) 745-749.

If the assumptions be valid that the lag phase of bacterial multiplication is constant when *M. leprae* are repeatedly harvested from untreated mice and passed to other mice of the same inbred strain and that those *M. leprae* capable of multiplying in the mouse foot pad do so always at the same rate, then the results of these experiments may be interpreted to show that once the peak of bacterial multiplication has been reached, death of *M. leprae* ensues. Death of *M. leprae* appears to have occurred in mice during DDS treatment at the same rate as in the untreated mice, but the lag phase of bacterial growth was uniformly prolonged as a result of treatment.—AUTHOR'S SUMMARY

Ptak, W., Gaugas, J. M., Rees, R. J. W. and Allison, A. C. Immune responses in mice with murine leprosy. Clin. Exper. Immunol. 6 (1970) 117-124.

Mice infected with *M. lepraemurium* showed marked histologic changes in the thymus and lymph nodes. In the thymus there was a progressive depletion of lymphoid cells and replacement by macrophages, many of which contained bacilli in the advanced stages of the disease. In lymph nodes there was depletion of paracortical immunoblasts and accumulation of macrophages. Infected mice showed impaired cell-mediated immune responses, including delayed rejection of skin grafts and depression or absence of contact sensitivity. Humoral immune responses to bovine serum albumin and sheep erythrocytes in infected mice were normal. The defect in cell-mediated immune responses is thought to be secondary to the massive infection, and is discussed in relation to impaired immune responses in human lepromatous leprosy.—AUTHORS' SUMMARY

Saha, K. and Mittal, M. M. Normal lymphocyte transfer tests in leprosy. Clin. & Exper. Immunol. 6 (1970) 969-974.

Lymphocyte transfer tests (intradermal inoculations of 2.5 million of allogenic lymphocytes) were done in 5 normal persons, 5

lepromatous leprosy and 4 tuberculoid leprosy patients. Observations were made daily for at least 10 days. In normal persons an initial reaction of moderate induration and erythema reached its maximum diameter between 24 and 48 hours and a secondary reaction occurred on the 3rd-5th day, reached its peak on the 6th-7th day and disappeared between the 10th and 13th day. In the lepromatous leprosy cases there was neither an initial nor a secondary reaction. In 2 of 4 cases of tuberculoid leprosy only an initial reaction was observed while in the other 2 cases the reaction appeared on the 4th day, reached its peak on the 6th day and persisted to the 13th day.—
AUTHORS' SUMMARY

Garrie, S. A. and Levan, N. Cell-window tests in lepromatous leprosy. *Lancet* **1** (1970) 1116.

None of 4 patients studied showed any depression of the mononuclear phase of their leucocytic cycle. Thus, this preliminary investigation does not indicate that the analogy between Hodgkin's disease and lepromatous leprosy holds true with respect to the cellular-inflammation cycle.—
AUTHORS' SUMMARY

Miranda, R. N. Resultados da inoculação experimental da lepra humana no préa ("*Cavia aperea aperea*" Erxleben, 1777). [Results of the inoculation on experimental human leprosy in the préa ("*Cavia aperea aperea*" Erxleben 1777).] Publ. Centro Estudos Leprol. (Parana) **10** (1970) 14-23. (Portuguese and English)

The "préa," a Brazilian rodent of the family "Caviidea" (similar to the guinea-pig) was inoculated intradermally with material from human leprosy. Two of the 4 animals were sacrificed at 195-226 days, biopsy specimens were obtained from the other two. Some lesions at the site of inoculation were very much like the lesions of

lepromatous leprosy, with globi of acid-fast bacilli. No generalized infection was found in 2 animals sacrificed.—G. L. FITE

Pedley, J. C. Summary of the results of a search of the skin surface for *Mycobacterium leprae*. *Leprosy Rev.* **41** (1970) 167-168.

From this extended search the following conclusions can be made. *M. leprae* do not emerge from intact human skin. Skin to skin transmission of the organism is therefore unlikely to occur. Thus, by the process of elimination, the most likely method of transmission is by ingestion and inhalation.—G. L. FITE

Goodwin, C. S. and Wood, M. J. Bacteria isolated from plantar ulcers of Ethiopian leprosy patients, with the antibacterial drug sensitivities of the isolates. *Trans. Royal Soc. Trop. Med. & Hyg.* **64** (1970) 421-425.

Bacteriologic sampling of grossly infected or chronic plantar ulcers was performed in 39 untreated patients with leprosy and in 22 patients who had received antibiotic treatment. Samples were cultured aerobically and anaerobically, and films of pus were stained by Gram's method. Stained films gave little indication of the type of infecting pathogen, except when Gram-positive cocci alone were seen. From the ulcers of patients untreated with antibiotics anaerobic streptococci were isolated more frequently than any other organism, and this may be an original observation. Of the 8 *Staphylococcus aureus* isolates 5 were penicillin sensitive. A range of Gram-negative bacteria, but no *Clostridia*, were isolated. From the ulcers of patients who had received antibiotics penicillin-resistant *Staph. aureus* was most frequently isolated. Some Gram-positive bacteria resistant to tetracycline were sensitive to doxycycline—
AUTHORS' SUMMARY

Epidemiology and Prevention

Bechelli, L. M. and Martínez, Dominguez V. Evaluation of leprosy control programmes: some suggestions for operational and epidemiological assessments. *Bull. WHO* **42** (1970) 631-634.

This is something in the way of an addendum to Bechelli's earlier "Guide to Leprosy Control" and allied WHO communication and should be examined by those immediately interested.—G. L. FITE

de Souza Lima, L. Considerações sobre o real valor da sulfonoterapia nos programas de profilaxia da lepra. [The value of sulfone treatment in programs of prophylaxis against leprosy.] *Rev. brasileira Leprol.* **36** (1968-69) 31-36.

The author considers the real value of sulfone therapy in the programs of control of leprosy based on the results of the sulfone treatment of cases of lepromatous, borderline and indeterminate leprosy. He points out that the regular sulfone treatment of the cases of the indeterminate group is the most efficient procedure for the control of leprosy, because of the capacity of this drug to prevent transformation of these noninfectious into infectious cases of the lepromatous type or of the borderline group. Emphasis is given to the possible development of sulfone-resistance and the author advises the use of a triple association of drugs (parent-sulfone, thiambutostine, long acting sulfonamides) in order to avoid this occurrence.—G. L. FITE

Rees, R. W. J. The Kveim test in leprosy. *Postgrad. Med. J.* **46** (1970) 486-490.

From the older literature it has been claimed that a significant proportion of patients with the tuberculoid but not the lepromatous, form of the disease, gave positive Kveim reactions. It is concluded, however, from a review of this older literature that none of the claims are based on studies using a validated Kveim antigen and that the majority of the readings were based on macroscopic, rather than microscopic assessment. The International Study by Siltzbach on Kveim tests in leprosy patients

using a validated antigen and assessed microscopically reveal no positive reactions among 57 patients with all types of leprosy from Finland, Israel, Italy and Turkey. However, this same study on Japanese patients gave 2 positive and 5 equivocal Kveim reactions among 10 lepromatous patients and one equivocal reaction among 3 tuberculoid patients. Our own studies in Malaysia with the same validated Kveim antigen used by Siltzbach and assessed microscopically gave one weak positive Kveim reaction among 21 lepromatous patients and 4 equivocal Kveim reactions among 9 tuberculoid patients. It is concluded from these results that, with the possible exception of Chinese and Japanese patients, false-positive Kveim reactions are extremely rare in patients with all types of leprosy. Therefore in parts of the world where leprosy is endemic the Kveim reaction can still be accepted as an important confirmatory diagnostic test for sarcoidosis. It is suggested that further surveys of Kveim reactivity be undertaken on Chinese and Japanese leprosy patients, since both have a similar ethnic origin, in order to determine whether such patients are more liable to elicit a granulomatous reaction to Kveim antigen.—AUTHOR'S SUMMARY

Gimenez, M. M., Risso, H. I., Moglia, C. A., Ribichini, J. J. and Waisman, R. Comentarios sobre la lepra infantil en El Chaco. [Childhood leprosy in Chaco.] *Leprológia* **14** (1969) 86-89.

The most common types of leprosy seen in the Chaco area in children were tuberculoid and indeterminate, each contributing about 43% of the cases. Dimorphous cases numbered 2% and lepromatous 12. In the few cases (21) in the 0 to 4 age group 14 were tuberculoid, characterized by many individually small lesions. The remaining 7 were all indeterminate. Tuberculoid cases decreased progressively with increasing age to 38% in the 10 to 14 age group. In high prevalence areas nonfamilial transmission becomes significant.—G. L. FITE

Cap, J. A., Mani, R. S. and Rao, D. M. Pogiri Leprosy Control Project. Methodology and achievements. *Pakistan Med. Forum* 5 (1970) 41-61.

In 1962 a leprosy control project was started in Pogiri, India, by the Danish Save The Children Organization, with technical guidance from WHO and assistance from UNICEF. The area covered is 5,000 km.² with a population of 1½ million. At present 28,886 inside area patients are treated. The basic working unit consists of a field clinic held by a leprosy auxiliary worker who is responsible for case finding and case holding in a population of about 20,000. Seventy such clinics spread over the area, which is divided into five zones, each with 10 to 15 clinics supervised by two to three senior members. A small headquarters hospital provides hospitalization during acute phases of leprosy. It has been proved by mass survey of a pilot area that 81% of the existing cases were detected by health education, school survey and contact survey. Through intensive supervision and personal contact of the worker with patients and population an average attendance rate of 78% was reached. After 6 years 9,919 cases have been recorded as inactive, resulting in a steady decrease in the number under observation. A total of 4,194 patients have been "released from control."—(Authors' summary, slightly modified)

Fink, E. H. Die Verbreitung der Lepra in Spanien und die seit 1948 durchgeführten Bekämpfungsmassnahmen. [Prevalence of leprosy in Spain and control measures since 1948.] *Zeitsch. f. Tropen. u. Parasit.* 21 (1970) 135-145.

By assessment of epidemiologic and clinical data a general account of leprosy prevalence in Spain is given as it has evolved since a campaign to eradicate this disease was started in 1948: About 5,000 leprosy patients are registered with the Health Authorities in Madrid; more than 1,200 of them are considered sufficiently treated and cured and more than 500 show acid-fast bacilli on bacterioscopic examination. These cases are distributed over four endemic areas, namely (arranged in the order

of decreasing importance) Andalusia, the Levant Provinces from Alicante to Barcelona, the Canaries, and Galicia, a region north of Portugal. Since the prevalence of active cases has not shown any striking changes during the past 10 years, a consolidation phase—as defined by WHO criteria—has probably been achieved. Nevertheless, eradication of leprosy in Spain is not to be expected in the immediate future as indicated by the annual incidence. During recent years, an increasing number of early cases, i.e., within one or two years after the first clinical manifestations, have been detected. The institutions taking part in the campaign and their activities are described. Despite the low infectivity of leprosy, exchange of information between the Public Health Authorities of neighboring European states is recommended. This would also confer advantages on those patients moving from one country to another as far as uninterrupted medical care is concerned.—AUTHOR'S SUMMARY

Chum, H. J. and Otsyula, Y. Leprosy disability in Yimbo and its economic effects. *East African Med. J.* 47 (1970) 389-394.

A leprosy survey for disability was attempted in Kenya. The proportion of disabled leprosy cases is 4.13%; males are more disabled than females, although numerically there are more leprosy cases among the females. The majority of disabled patients lose their jobs and their earning capacity and become a burden to their families and, in the long run, to the state. Early diagnosis and treatment, contact tracing, and periodic surveys on location or district levels are some of the possible solutions. The study was difficult in Yimbo and without home visiting, it would have been impossible.—AUTHORS' SUMMARY

Abrahams, E. W. "Original mycobacterial sin." *Tubercle* 51 (1970) 316-321.

School children in Queensland have, in general, greater reactions to avian than to human PPD. After vaccination with BCG they still show a predominance of avian reactions. A group of children who had been vaccinated shortly after birth were tested with avian and human PPD up to 16

years after vaccination. There was a significant excess of children with greater human reactions. It is suggested that the first mycobacterial infection may set the antigenic reaction pattern. Secondary infection by an antigenically similar mycobacterium would then not alter the pattern of response. A similar phenomenon has been reported with influenza viruses.—AUTHOR'S SUMMARY

de Aguiar Pupo, J. *Lepra familiar.* (Influência da lepromatose cumulativa no expansão endêmica.) [Familial leprosy. (Influence of cumulative leprosy on endemic expansion.)] *Rev. brasileira Leprol.* 36 (1968-69) 11-22.

The lepromatous population of Brasil (53,722 cases in the state of São Paulo alone reported up to 1967) is a result of deficient control of endemic leprosy. The author believes that perpetration through decades of inter-familial contacts, with occult cases seriously a problem, has brought about a cumulative effect on endemic expansion of leprosy. In spite of current liberal regimens beginning with the Belo Horizonte Seminar in 1958, sanatoria with humanitarian and social purpose must continue for many years to come to provide care for many lateral requirements of the needy. They are "indispensable for therapeutic investigations in the field of new drugs." Preventive medicine is seen as the most promising expedient.—G. L. FITE

Bose, A. K. Problems of leprosy. *Indian Med. J.* 55 (1970) 63-64.

An editorial review urging the medical profession to accept responsibilities to eradicate leprosy.—G. L. FITE

Schofield, F. D. Some relations between social isolation and specific communicable diseases. *American J. Trop. Med. & Hyg.* 19 (1970) 167-169.

The causative agents of disease reach human beings by passing through environments formed by diverse cultures. These cultures affect both the pattern of the disease and the ease and efficacy of control measures. In developing countries there are problems of controlling specific diseases

(such as smallpox, leprosy, and tuberculosis) spread by or within population groups that are socially but not geographically isolated. The cultural values of some socially isolated groups may provide a distillate of the values that are more widely diffused in the general population, and thus provide profitable study for public-health planners and practitioners. The converse proposition is that some specific communicable diseases may strongly affect culture, including social structure. The social response to endemic leprosy and widespread tinea imbricata has been stratification of apparently homogenous populations into two distinct social groups. If continued, the effect of this process will be to concentrate and isolate any genetic factors that may be associated with these diseases. The effect of modern cultural change in these situations so far has been to add to the social disabilities of the sufferers.—AUTHOR'S ABSTRACT

René-Boisneuf, J. Hypothèse de travail sur la transmission de la lèpre. [A hypothetical means of transmission of leprosy.] *Bordeaux Med.* 3 (1970) 1063-1966.

The author discusses the possibility of insect transmission, in relation to experiences in which filariasis complicated the picture.—G. L. FITE

Salzano, F. M. and Blumberg, B. S. The Australia antigen in Brazilian healthy persons and in leprosy and leukemia patients. *J. Clin. Path. (Brit)* 23 (1970) 39-42.

The Australia antigen was found in none of 218 leprosy patients, in 2 of 50 leukemia patients, and in 3 of 358 Negro subjects, but not in 275 white persons. The antigen is not found in increased frequency in lepromatous leprosy in areas where the antigen is not common in the population, but is significantly more common in this disease where the frequency is high in the general population. The authors surmise that these leprosy patients are more susceptible to chronic hepatitis, which would become manifest only where the Australia antigen is relatively common generally.—G. L. FITE

Pinto Dias, J. C. and Alves da Cunha, D. Hanseníase e doença de Chagas. [Leprosy and Chagas' disease.] *Rev. Soc. brasileira Med. Trop.* 4 (1970) 31-43.

In leprosy patients at the Bambui (Minas Gerais) Sanitarium, an area in which Chagas' disease is endemic, 38.63% positive serologic tests for American trypanosomiasis were found. Both groups of positive and negative patients were examined from a clinical electrocardiographic and radiologic point of view. The data were compared

to others of the region, suggesting that the sulfonamide treatment in these cases, did not change the positiveness of "Guerreiro & Machado" reaction. Apparently neither does the leprotic process interfere with the evolution of Chagas' disease, nor does the latter interfere with the former. Clinical findings of non-chagasic group permit one to foresee the possibilities of cardiovascular consequences in leprosy, not yet well limited and with few searches in medical literature.—AUTHORS' SUMMARY

General and Historical

Gussow, Z. and Tracy, G. S. Stigma and the leprosy phenomenon: the social history of a disease in the nineteenth and twentieth centuries.] *Bull. Hist. Med.* 14 (1970) 425-449.

The first 60% of this article recounts 19th century development of attitudes toward leprosy. The authors have dug into many little known reports, extracting from them the evidences of popular attitudes toward leprosy. These appear almost exclusively to have been taken from English language reports, and one misses reference to the problem in Latin American countries, for example, from which much significant writing has arisen.

"Following the peak of the alarm years of 1889-1891 leprosy ceased to be salient to Westerners." Recognizing that leprosy presently shows no signs of spreading to fresh populations, appeals made to Westerners where leprosy is not an imminent threat may carry little meaning. "The immediacy of leprosy needs to be made known to the scientific world, but not the public."

The authors regard the current "destigmatization" theory as resting on a mythologic foundation, the presumption being that leprosy is stigmatized by what is shown to be a recent, pervasive enactment of the parable. "A rational fear of the disease cannot be attenuated through the myth that it is stigmatized by virtue of a faulty association with biblical references and images. For this there are far too many uncertainties and unsolved physiological and epidemiological problems in leprosy."

The writers of this engaging essay will not always be understood by the readers, and statements such as "With advances in research and knowledge the problem is now one of how to re-secularize the disease," are puzzling indeed, at least to analysis by this reviewer. Nevertheless, this work, presented in brief at the London Leprosy Congress in 1968, offers a fascinating critique of the "leper" and social change.—G. L. FITE

Browne, S. G. How old is leprosy? *British Med. J.* 3 (1970) 640-641.

In this brief report Browne reviews and inspects the Møller-Christensen evidence of ancient leprosy in Denmark, with updated subsequent addenda.—G. L. FITE

Berkeley, J. S. Leprosy. *J. Roy. Coll. Gen. Pract.* 20 (1970) 263-268.

A straightforward review of current aspects of leprosy.—G. L. FITE

Hathaway, J. C. Leprosy in Hawaii. *Hawaii Med. J.* 29 (1970) 429-437.

This review presentation is derived from a lecture given annually by the author to candidates for medical licensure in the state of Hawaii, for which one requirement is an "orientation course" in leprosy. The writer, who is chief of medicine at the Hale Mohalu Hospital, describes this as "an attempt to outline the basic facts of leprosy," which it does with some special reference to past and present observations in Hawaii.—G. L. FITE

Krampitz, H. E. Aussatz—trotz allem "Schicksal voller Rätsel." [Leprosy—still an unsolved riddle.] *Aktuelle Medizin*. Beilage Munch. Med. Wochens, 2 October 1970.

This brief review of the problems of early diagnosis, transmission, and modern treatment of leprosy emphasizes that in spite of many interesting individual observations, the factors determining the spread of the infection and the nature of the disease in the given patient are not definitely known.—G. L. FITE

Rotberg, A. "Hanseniasis," the new official name for leprosy in São Paulo, Brazil. *Dermatol. Internat.* 8 (1969) 40-43.

The author has been extensively engaged for several years past in an inquiry relative to the desirability of another name for leprosy. Many students of the disease replied to a questionnaire sent by him. The results, briefly presented here, suggest a geographic difference in opinion. Of European, United Kingdom and United States respondents a majority opposed change. Asian and African majorities gave equivocal replies, the majority of answers being classified in the "Partly" column. Perhaps surprising to many, 95 to 103 answers favored a change of name. Even allowing for the inherent bias in questionnaire data, these findings suggest clearly a problem in this social aspect of leprosy, most important in Latin America.—G. L. FITE

Rotberg, A. Integração da hansenologia no Universidade e nos Serviços de Saúde Pública, em São Paulo. [Integration of hansenology in the University and in the Public Health Services in São Paulo, Brazil.] *Publ. Centro Estudos Leprol.* (Parana) 10 (1970) 31-38. (Portuguese and English) Also in *Rev. brasileira Leprol.* 36 (1968-1969) 53-56.

This brief report summarizes the cooperative efforts of agencies of the state of São Paulo to treat leprosy in dispensaries rather than as hospital patients. The Padre Bento Sanitarium is to be made into a general hospital and has had no long-term patients since 1967. An entirely new medical school,

health department and treatment management is in process of formation.—G. L. FITE

Bloombaum, M. and Gugelyk, T. Voluntary confinement among lepers. *J. Hlth. & Social Behavior* 11 (1970) 16-20.

Unfortunately "lepers" crept into the title of this communication, and the "leper" colony was established at Kalaupapa in 1866. Otherwise this is a mild, good natured, historical, factual statement (of what has been long known) that many patients come to like their new home. The authors' summary reads: "Sufferers of leprosy in whom the development of the disease has been arrested by the use of sulfones elect to remain in confinement when eligible to return to the general community. Stigma and the effects of prolonged tenure in the settlement are held most probably to account for this reverse isolation in a total institution."—G. L. FITE

Bishop, P. J. and Neumann, G. The history of the Ziehl-Neelsen stain. *Tubercle* 51 (1970) 196-206.

This engaging account of the early technology of the staining of mycobacteria credits, correctly enough, the earlier work of Koch, Ehrlich, and Rindfleisch. Curiously, it omits notice that Neisser had already used fuchsin for demonstration of *M. leprae* in 1879, although he apparently did not acid-wash the preparations before counterstaining. Ziehl was later a practicing neurologist in Lübeck for many years, where he died in 1926 at age 69. Neelsen lived only a comparatively short time, dying of tuberculosis in 1894 at age 40, and much of his life has become obscure. The bibliography includes 44 19th century references to the topic, which may seem extraordinary, but a look at a 1930 edition of the now defunct *Kolle and Wasserman "Handbuch"* would yield many hundreds more added within the first 3 decades of the twentieth century.—G. L. FITE

Goldman, L. Favus again mistaken for leprosy in the renaissance. *Arch. Dermat.* 101 (1970) 688.

"The Governors of the Leprosy Hospi-

tal," a painting by Jan de Bray in the Frans Hals museum in Haarlem, yields a pictorial

example of the confusion of scalp conditions and leprosy in the Middle Ages.

Other Mycobacterial Diseases

The Uganda Buruli Group. Clinical features and treatment of pre-ulcerative Buruli lesions (*Mycobacterium ulcerans* infection). (Written for the group by Dr. W. D. L. Revill, Professor M. S. R. Hutt, and Mr. J. W. M. Kiryabwire). British Med. J. 1 (1970) 389-395.

At Kinyara, and in other areas of Uganda, 250 patients with pre-ulcerative Buruli lesions (*M. ulcerans* infection), have been seen over the past 3 years. The clinical feature of the pre-ulcerative stage of the disease are painless nodules, usually occurring singly on the legs or forearms. As the nodule can grow rapidly to become an extensive fulminating lesion, early recognition of the nodule and an appreciation of its significance by both doctor and patient are essential. Excision of the nodule is simple and usually curative, thus preventing ulcers developing and requiring prolonged hospital treatment.—AUTHOR'S SUMMARY

A companion lead article (pp. 378-379 in the same issue) adds the following point:

In necrotic tissue from the base of the ulcer large numbers of acid-fast *M. ulcerans* will usually be seen, but these are scanty at the margins—a point of importance when diagnostic biopsy is being considered. The mode of transmission is uncertain, but the frequency with which the disease is found in riverine and similar regions has suggested that exposure to water containing the organisms plays a part.

Flowers, D. J. Human infection due to *Mycobacterium marinum* after a dolphin bite. J. Clin. Path. 23 (1970) 475-477.

A young man employed at the local aquarium was bitten by a bottlenose dolphin (*Tursiops truncatus*) during a training session, receiving a slight injury which healed rapidly. Some two months later fluctuant swellings appeared in the region of the

bite, which developed into indolent ulcers which have not completely healed seven months after the original bite. Cultures taken on two occasions have yielded a pure growth of *M. marinum*.—AUTHOR'S SUMMARY

Klokke, A. H. Epidemiological analysis in a patient with skin granuloma caused by *Mycobacterium balnei*. Dermatologica 140 (1970) 303-309.

The diversity of sources of infection in 540 cases of *M. balnei* granuloma described to date points to the need for continuing epidemiologic investigation. The infection of the reported case was contracted in brackish harbor water near the outlet of cooling water from an electric power station. *M. balnei* was isolated from the filters inside the generator. Intradermal testing with human tuberculin and *M. balnei* antigen in 108 factory workers exposed to cooling water, strongly suggested the existence of subclinical occupational infection.—AUTHOR'S SUMMARY

Mansson, T. Mycobacteria from aquaria. British Med. J. 3 (1970) 46.

The letter writer reports two fishes from an aquarium from which *M. marinum* was recovered and identified, in reference to a previous report in *The British Medical Journal* of 23 May 1970.—G. L. FITE

Klotz, P. G. Atypical acid-fast bacteria in urine. Canadian Med. J. 103 (1970) 283-284.

In the author's personal experience, 12 patients have shown Runyon's organisms on urine culture. However, no specific lesion has been recognized in the genitourinary tract. Each specimen yielded organisms of the same group on two or more cultures. Urologists may expect to be confronted with atypical acid-fast bacteria growing in

the urine. It is uncertain whether the bacteria can be considered pathogenic in the urinary tract. Their characteristics and sig-

nificance are presented and some personal experiences and provincial-wide statistics are cited.—AUTHOR'S SUMMARY