CURRENT LITERATURE

This department carries selected abstracts of articles published in current medical journals dealing with leprosy and other mycobacterial diseases.

General and Historical

Boughton, C. R. Leprosy since Hansen. Med. J. Aust. **1** (1979) 551–552.

This review article begins by summarizing the history of research by Gerhard Henrik Armauer Hansen. It is pointed out that he was the first person to challenge the theory that leprosy was a hereditary disease, as had been suggested by his Norwegian predecessors in leprosy research, D. C. Danielssen and C. W. Boeck, basing his claim that leprosy was an infectious disease on epidemiological studies he conducted during 1867 while practicing medicine in the fishing village of Lofoten. In 1874, Hansen published a report describing his microscopic observation of leprosy bacilli obtained from skin scrapings, and in 1879, Albert Neisser succeeded in staining the rods of the leprosy bacillus. The article continues by pointing out that because bacteriology was in its infancy, Hansen had little success in inoculating animals with material from lepromatous tissue, an event which had to await the success of Shepard in 1960 in inoculating the foot pads of mice with suspensions of *M. leprae*. The article next very briefly reviews the research activities of R. J. W. Rees and O. K. Skinsnes as well as the history of the chemotherapy of leprosy and concludes with a warning to Australian physicians to be aware of the danger of leprosy in the country because of the arrival of immigrants from endemic areas as well as because it has been endemic in the northern parts of the country.—G. Gordon

Bullock, W. E. Immunology and the therapeutics of leprosy. Ann. Int. Med. **91** (1979) 482–484. (guest editorial)

This guest editorial provides an overview of the clinical immunology of leprosy. Emphasis is given to the concept that the specific anergy in lepromatous leprosy may be mediated by suppressor-cells. Past efforts to attempt to correct or ameliorate a presumed deficiency of cell-mediated immune responsiveness in lepromatous leprosy patients are reviewed. The preliminary findings regarding suppressor-cell activity in lepromatous leprosy are mentioned, and it is pointed out that therapy aimed at blocking the function of these suppressor-cells may permit improved and presumably beneficial expresssion of activity by the helper limb of the cell-mediated immune response. The author reviews work involving the development of serodiagnostic tests in leprosy. The author points out two serious therapeutic problems in lepromatous leprosy, secondary resistance to dapsone and microbial persistence in which drug sensitive bacilli survive in tissue despite long term therapy. Vaccine development as it relates to the possibility of a genetic mechanism is reviewed as well as remaining areas in research dealing, for example, with circulating immune complexes in leprosy patients.—RCH

Dols, M. W. Leprosy in medieval Arabic medicine. J. Hist. Med. **34** (1979) 314–333.

This article is a lengthy scholarly review of the historical mention of leprosy in the writings of the classical Greek and Moslem physicians. The author begins by stating that true leprosy can only be affirmed to exist in the West as late as 300 B.C. when the physicians of Alexandria used the terms *elephas* or *elephantiasis* to describe the lepromatous form; tuberculoid leprosy was frequently confused with other nonspecific skin eruptions and awaited accurate de-

scription until much later. He points out that the confusion between *elephantiasis* and *lepra* (here he means true leprosy) persists into the Christian era; Pliny the Elder (1st c. A.D.) and Galen (ca. 200 A.D.) use the terms interchangeably, and the latter integrates its etiology into humoral theory, claiming it is caused by a surfeit of "black bile." The author believes, however, that "very generally" the pre-Islamic doctors of late antiquity may have used the term "*lepra*" "to describe early stages of lepromatous leprosy and, more likely, the macules and infiltrated lesions of tuberculoid leprosy" and the term "*elephantiasis*" to describe "the condition that we understand as lepromatous leprosy."

The author states that leprosy assuredly existed in the pre-Islamic Arab world. The Arabic word *judhām* (deriving from the linguistic root meaning "to mutilate" or "to cut off") may well refer to advanced forms of lepromatous leprosy, and the Arabic word *baras* (deriving from the linguistic root meaning "to be white or shiny") may have referred to leprosy in its early stages or to its tuberculoid form. These terms, as well as numerous others, appear in Islamic medical texts, but only the term *judhām* appears to have been restricted exclusively to leprosy while the others may have referred to as wide ranging a spectrum of diseases as leucoderma, scleroderma, Addison's disease, and chronic malaria.

The author continues by pointing out that practically every Arabic writer on medicine discussed leprosy. They all borrowed heavily from classical Greek sources, and so they continued to employ humoral theory to explain the disease, typically advocating treatments such as bloodletting or drinking wine in which a venomous snake had been submerged. Notably, however, Ibn Sīnā accurately described many of the consequences of leprosy such as respiratory difficulties, destruction of finger joints and of the nasal septum, ulcerations of the foot, and the presence of nodules on the skin; and Ibn al-Quff described the loss of sensation. By the twelfth century, translation of Arab texts into Latin caused these observations to be made available as well in Western medical literature.

In treating the issue of isolation of persons afflicted with leprosy from the unaffected population, the author points out that this practice existed in medieval Arabic society both as a result of medical warnings about the dangers of contagion as well as because of religious belief that the disease came from God; he appears to believe, however, that the medieval Arabic world ascribed infection with leprosy much less to moral failure in the victim than occurred in the Western world.

It should be noted that the author is an historian, not a leprologist, but he has evidently taken pains to educate himself about the general nature of the disease and handles its basic terminology with ease and accuracy.—G. Gordon

Kapoor, P., Deodhar, N. S. and Yellapurkar, M. V. Integration of leprosy control work with general health services as planned in Maharashtra. Health Popul. **1** (1978) 51–61.

The current literature on integration of leprosy control work with general health services has been reviewed. In view of the introduction of the multipurpose workers' scheme and experience in a pilot project, the authors feel that the time for integration of leprosy is ripe. The process of involvement of multipurpose workers in the leprosy control program is being introduced in a manner that insures adequate supervision by the present leprosy control staff during the training period and also subsequently for one year so that the transition from unipurpose to integrated service is a smooth one. After the successful integration of leprosy, the leprosy staff, after adequate training, can be used as multipurpose supervisors.—(*from* Trop. Dis. Bull.)

Pattyn, S. R. Tuberculosis and leprosy—a comparison. Acta Leprol. **73** (1978) 3–11.

The article compares and contrasts tuberculosis and leprosy from the standpoint of their bacteriology, epidemiology and mode of transmission, host response, and pathogenesis. Work is summarized in the two diseases, dealing with experimental transmission and experimental therapy. The treatment of the two diseases clinically is reviewed and contrasted. Although the review shows many differences between the two diseases, there are a number of par-

allelisms illlustrated. The author takes the position that leprosy can learn much from the studies performed in tuberculosis, particularly in connection with the overall strategy to be applied.—(*Adapted from the article*)

Sutherland, I. Tuberculosis and leprosy. *In: World Geography of Human Disease*, G. H. Howe, ed., London: Academic Press, Inc., 1977, pp. 175–196.

This chapter is a scholarly review and juxtaposition of the two principal mycobacterial diseases of man, tuberculosis and leprosy. The author first reviews tuberculosis and leprosy as separate entities, discussing their microbiology, host parasite relationships, and epidemiology and factors influencing the geographical variations and secular trends in the diseases. The material presented regarding tuberculosis is considerably more extensive than that for leprosy, and from the leprosy standpoint, the tuberculosis information makes for interesting comparisons with what is known and theorized by most leprologists. The author then discusses interactions between mycobacterial infections. Experience with BCG vaccinations is compared in the two diseases, and it is interesting to note that BCG offers approximately 80% protection against tuberculosis, a figure similar to the effect in non-lepromatous leprosy in Uganda. The author notes that there is indirect evidence that natural infection with "atypical" mycobacteria confers a degree of protection against tuberculosis, particularly in the southeastern United States, but that other mycobacterial infections occurring in Uganda do not seem to protect against leprosy. It is not known whether a primary infection with leprosy confers any protection against tuberculosis, but there is evidence that in Uganda, a primary infection with tubercle bacilli confers protection against non-lepromatous leprosy (to an extent similar to BCG in the same area). The point is made that BCG vaccination, superimposed on a naturally occurring mycobacterial infection which confers a lesser degree of protection than BCG, confers enough additional protection to bring the level up to that conferred by BCG alone, but no higher. The presence of a naturally occurring mycobacterial infection in an area, which confers some degree of protection against tuberculosis or leprosy, might therefore not only affect the natural epidemiology of the disease in the area but may also affect the extent to which this epidemiologic pattern can be artificially modified by vaccination. The author points out that the endemic level of either disease in a given area is the result of the action and interaction of many factors, including the virulence of the infecting bacilli, the opportunity for contagious spread, natural infections with other mycobacteria, the general health and resistance (including perhaps genetic resistance) of individuals to infection and disease, including their nutritional levels and status in regard to intercurrent disease, and the rapidity and effectiveness of treatment of the infectious cases. In some areas, the totality of these factors favors a high level of endemicity and in other areas a low level. For the eventual eradiction of the diseases, it is not necessary that transmission be immediately and completely prevented; it is only necessary that the rate of transmission be held permanently below the level at which a given number of infection-spreading cases succeed in establishing an equivalent number to carry on the succession. If, in successive periods of time, the number of infectious hosts is continually reduced, the end result of this diminishing ratio, if continued long enough, must be extermination of the disease. In a number of developed countries, the secular trends in both diseases suggest that the balance is clearly tipped against the survival of the bacilli. In these countries there would seem to be no special need to intensify existing control measures. This trend is by no means universal, however, and in many developing countries there may be no signs of improvement in the secular trends. In such countries the urgent need is to develop and implement more intensive control programs.—RCH

Chemotherapy

Anand, L. C. and Rathore, B. S. Activity and effective serum level of repository sulphones (DADDS) in lepromatous leprosy. Lepr. India **51** (1979) 358–363.

Thirty-five cases with lepromatous leprosy were studied to evaluate the effective blood level and long depot action of acedapsone (DADDS). It was revealed that the serum level of this drug is maintained well above the minimum inhibitory concentration up to 60 days following a single intramuscular injection. No significant untoward effects of the drug were encountered except one case of erythema nodosum leprosum and six patients with mild reactional symptoms in the form of fever and arthralgia.—Authors' Summary

Banck, G. and Forsgren, A. Antibiotics and suppression of lymphocyte function *in vitro*. Antimicrob. Agents Chemother. **16** (1979) 554–560.

The effects on the mitogenic response of human T lymphocytes were studied for 20 different antibiotics. No apparent inhibitory effect could be detected for penicillins, cephalosporins, aminoglycosides, chloramphenicol, sulfamethoxazole, trimethoprim, nalidixic acid, and 5-fluorocytosine. There were effects at high concentrations with erythromycin, clindamycin, and rifampin, and these antibiotics could also be shown to depress the mitogenic response of B lymphocytes. With fusidic acid, nitrofurantoin, and doxycycline there was an inhibiting effect at low concentrations on the mitogenic responses of B and T lymphocytes and on *in vitro* antibody production. Protein synthesis in unstimulated lymphocytes was also inhibited. Some antibiotics thus may impair the function of human lymphocytes *in vitro*.—Authors' Summary

Botha, P., Berman, P. A., Elisha, G. and Callanan, J. J. Some aspects of aminoglycoside antibiotic measurement. S. Afr. Med. J. **56** (1979) 211–213.

More than 2 years of experience in assaying aminoglycoside antibiotic levels have proved that the appropriate acetyltransferase employed in conjunction with ^{14}C-acetyl co-enzyme A provides rapid, reproducible results (CV = 4%). These results are available before the next administration is due, enabling the clinician to adjust the dose. This is especially indicated if there is impairment of renal function.—Authors' Summary

Carayon, A. La chimiothérapie anti-hansénienne face à la névrite (orientation nouvelles). (Chemotherapy of neuritis in leprosy [new approaches].) Hansenologia Internationalis **2** (1977) 24–46. (in French)

The mechanisms of activity of chemotherapy, immunotherapy, antibiotic therapy, and surgery in hansenic neuritis are presented. The clinical, bacteriological, and pathological pictures of the different types, varieties, and stages of neuritis are described and should serve as a guide for the institution of the appropriate therapeutical measures.—(*from* Trop. Dis. Bull.)

Languillon, J. Traitement de la maladie de Hansen par une dose unique de 1.5 g de rifampicine associée à une sulfonothérapie continue. (Treatment of leprosy with a single dose of 1.5 gm of rifampin together with prolonged treatment with a sulfone.) Méd. Trop. **37** (1977) 717–719. (in French)

After successful experience with various doses of rifampin given together with other drugs, the author records an investigation into the treatment of newly diagnosed patients suffering from lepromatous leprosy with a single dose of 1.5 g of rifampin and a daily dose of 25 mg of dapsone for 1 month, increased to 50 mg daily the second month and subsequently. Not only did the Morphological Index fall to zero (from over 50%) in 6 weeks, but the clinical improvement was remarkable.

In the case of relapse due to the emergence of resistant forms of *Mycobacterium leprae*, the author gives 100 mg of clofazimine every other day in addition to the single dose of rifampin.

The author considers that this regimen should be adopted in mass-treatment pro-

grams in Africa.—S. G. Browne (*from* Trop. Dis. Bull.)

Rossi, E. and Montagna, G. Insufficienza renale acuta da rifampicina. (Acute renal insufficiency caused by rifampin.) Minerva Med. **69** (1978) 3319–3322. (in Italian)

A case of acute renal insufficiency associated with acute hepatitis that arose in the course of intermittent rifampin management is reported. Specific reagin-type antibodies were noted in the circulating blood. The clinical, morphological, and pathogenic aspects of the case are compared with those of kidney disease caused by penicillin. While certain clinical features appear in both situations, the histological and immunofluorescence data suggest that two separate pathological entities are involved.—Authors' Summary

Sheskin, J. Valoración de derivados de la talidomida en la leprorreacción. (Evaluation of thalidomide derivatives in lepra reaction.) Rev. Fontilles **22** (1979) 27–30. (in Spanish)

The beneficial effects of thalidomide in lepra reactions associated with lepromatous leprosy are well recognized. This has been well demonstrated in over 15 years of clinical use internationally.

Since thalidomide itself is contraindicated in pregnant women, a number of thalidomide derivatives have been evaluted for the treatment of lepra reactions in lepromatous leprosy: CG 601, CG 603, CG 805, CG 807, CG 809, CG 817 B, CG 3033, E 510, and E 511.

Only three of these, CG 601, E 510, and E 511, proved to be effective; in fact, only those which have teratogenic properties in animals were found to be effective in lepra reactions.—(*Adapted from* author's summary)

Takayama, K., Armstrong, E. L., Kunugi, K. A. and Kilburn, J. O. Inhibition by ethambutol of mycolic acid transfer into the cell wall of *Mycobacterium smegmatis*. Antimicrob. Agents Chemother. **16** (1979) 240–242.

Ethambutol simultaneously inhibited the transfer (presumably via mycolyl acetyl trehalose) of mycolic acids into the cell wall and stimulated the synthesis of trehalose dimycolates of *Mycobacterium smegmatis*. Structural similarities of the drug and mycolyl acetyl trehalose suggested that competitive inhibition was involved.—Authors' Summary

Terencio de las Aguas, J. Resultados del tratamiento con sulfonas a largo término en la lepra lepromatosa, con especial relación a las alteraciones renales y frecuencia de la sulfonoresistencia. (Results of long-term treatment with sulfones with special relation to renal complications and frequency of sulfone resistance.) Rev. Fontilles **22** (1979) 31–40. (in Spanish)

Sulfones and clofazimine are principal or first line drugs in the medical treatment of leprosy. Unfortunately, these drugs act rather slowly to render patients clinically inactive and act even more slowly in bringing patients to bacteriologic inactivity. Both sulfones and clofazimine are well tolerated, but it is necessary that multibacillary patients take these drugs for their whole lifetimes in order to avoid the development of bacterial resistance. Thus, from the point of view of chemotherapy, we are still far from reaching the ultimate goal of eradication of the disease and the rehabilitation of leprosy patients for whom humanity has acquired a great responsibility.—(*Adapted from* author's summary)

Waters, M. F. R., Laing, A. B. G., Ambikapathy, A. and Lennard-Jones, J. E. Treatment of ulcerative colitis with thalidomide. Br. Med. J. **1** (1979) 792–793.

The only generally accepted ethical use of thalidomide is in treating erythema nodosum leprosum (ENL), the immune-complex complication of lepromatous leprosy. Its value has been proved by double-blind, internally controlled trials, and it is the preferred treatment of severe chronic ENL in light-skinned male patients and postmenopausal women, being less toxic than corticosteroids. Its mode of action, however, remains uncertain.

Having observed over many years the excellent results obtained with thalidomide

in ENL, a leprosarium staff member with chronic ulcerative colitis asked that she might undergo clinical trial of the drug. Since immune complexes may play a part in the pathogenesis of ulcerative colitis, her request was accepted; we report here the results after 18 months' continuous treatment.—Authors' Summary

Clinical Sciences

Bateson, E. M. and Hargrave, J. C. Nerve calcification caused by leprosy in Northern Territory Aboriginals. Med. J. Aust. **2** (1979) 497–499.

Three cases of nerve calcification caused by leprosy (Hansen's disease) in Aboriginal patients from the Northern Territory of Australia are reported. This is a rare manifestation of the disease and is the result of direct nerve involvement of peripheral nerves with abscess formation and is usually seen in tuberculoid or borderline types of leprosy.—Authors' Summary

Bourgeois-Droin, Ch., Sansonetti, Ph., Bussel, A., Pennec, J. and Cottenot, F. Nécroses cutanées étendues au cours d'une lèpre lépromateuse en poussée réactionnelle. (Extensive skin necrosis in lepromatous leprosy in reactive exacerbation.) Nouv. Presse Méd. **8** (1979) 2357–2358. (Letter to the Editor) (in French)

Cutaneous necrotic lesions are rare in the course of nodular lepromatous leprosy. The authors report an observation dealing with the problem of etiologic diagnosis of a necrotizing vasculitis in Hansen's disease and report the results of plasma exchange associated with anti-reactional treatment. The case involved a 40-year-old female with nodular lepromatous leprosy since 1965. In 1967, in Guadeloupe, she experienced a febrile illness with associated necrotic lesions on the legs and large scars. In September 1977, rifampin was replaced with dapsone with doses increasing to 100 mg daily. She developed fever, diffuse pain of the legs, necrotizing purpura, hemorrhagic bullae, and many necrotic ulcerations in late December 1977. A biopsy taken from the edge of the lesions showed a vasculitis without leukoclastic angiitis. The patient had a circulating anticoagulant, anti-prothrombinase, and there were circulating immune complexes as demonstrated by polyethylene glycol precipitation. The patient's sulfones were discontinued, and she was treated wtih 200 mg daily of clofazimine and 300 mg daily of thalidomide. The patient improved; however, fever and cachexia persisted. The patient then had two plasma exchanges of 5 liters each, replacing the plasma with a solution of 4% albumin and an injection of 10 gm of gammaglobulin after each exchange. The patient became afebrile, the circulating anti-coagulant disappeared, and the circulating immune complexes reverted to normal. The authors consider the most probable etiology of the necrotizing vasculitis as being a leprosy reaction. Therapy of this condition utilizing plasma exchanges has not been performed previously to the authors' knowledge.—(*Adapted from the article*)

Chiron, J.-P., Denis, F., Maupas, Ph., Goudeau, A., Coursaget, P., Languillon, J. and Roux, G. Les marqueurs du virus de l'hépatite B chez les lépreux. (Hepatitis B virus markers in persons with leprosy.) Nouv. Presse Méd. **8** (1979) 659–662. (in French)

Hepatitis B virus markers were studied in 553 leprous sera and 100 control sera. HB_sAg detected by RIA was present in 25.4% of leprous and 12% of control sera. The anti-HB_s by RIA were found in 44.1% of patients and 38% of controls.

The overall picture obtained by studying HB_eAg, anti-HB_e, and anti-HB_c virus markers showed that essentially all the leprosy patients were, or had been, infected with hepatitis B virus. In this vertical study, it would appear that 2.4% of the cases represented recent or acute hepatitis; 23% were chronic carriers; 41.7% had been in times past infected but were cured, and the remaining third had been infected, but since coat markers were absent, it is more

than likely that they are an old infected group.

The study revealed no significant differences in the frequency of chronic forms of hepatitis between lepromatous and tuberculoid patients.—(*Adapted from* authors' summary)

Consigli, C. A. Clasificación de la lepra: ubicación de la forma indeterminada. Importancia capital de este tema. (Classification of leprosy: location of the indeterminate form. The great importance of this idea.) Hansenologia Internationalis **3** (1978) 48–54. (in Spanish)

An historical outline of the classification of the clinical forms of leprosy is presented, emphasizing the introduction of the indeterminate group and its importance in modern leprology. The present classification, based on the maintenance of that group and on the concept of polarity, has been proving satisfactory. It may perhaps be improved, but its essential characteristics must remain.—Author's Summary

Dash, R. J., Kumar, B., Sialy, R. and Rastogi, G. K. LH, FSH responses to GnRH in lepromatous leprosy. Horm. Metab. Res. **11** (1979) 413–414.

A significant increase in serum LH and FSH and a lowered serum testosterone have been reported in lepromatous leprosy, and this is consistent with extensive damage to the tubular and interstitial cells of the testes. This study reports the LH and FSH responses to gonadotropin releasing hormone (GnRH) in lepromatous leprosy. Basal LH and FSH serum levels were higher in lepromatous leprosy patients than in control subjects. Increases in FSH after GnRH were significantly higher in the lepromatous leprosy patients than in controls. Changes in LH were similar in both groups. The study documents responsiveness of the gonadotropins to GnRH in lepromatous leprosy. The degree of response is comparable to that of hypergonadotropic hypogonadism.—(*Adapted from the article*)

Delia, S., Nuti, M. and Soro, S. Rapporti tra HB_sAg e parrassitosi: osservazioni in pazienti con anchilostomiasi e con schistosomiasi. (Observation on the correlation between hepatitis B antigen and parasitic diseases.) Quad. Sclavo Diagn. **13** (1977) 238–243. (in Italian)

This study in Somalia was undertaken in order to determine the incidence of hepatitis B antigen in patients suffering from ankylostomiasis and schistosomiasis, in patients with leprosy, and in normal subjects. The results are set out in this table:

Diagnosis	*No. of cases*	*HBAg+*	*% +*
Ankylostomiasis	27	9	33.33
Schistosomiasis	54	14	25.92
Lepromatous leprosy	31	3	9.67
Tuberculoid leprosy	29	2	6.89
Leprosy + schistosomiasis	5	2	40.00
Normal	9	1	11.11

These results seem to indicate a correlation between the presence of HBsAg in the serum and some parasitic infections in which the parasite penetrates the skin. The two hypotheses advanced are: a) direct transmission, as has been proved with some insects and crustaceans, and b) indirect transmission in which the infection occurs through an already existing skin lesion.

This transcutaneous infection is of particular importance in tropical countries where insect bites, native medicine, circumcisions, infibulations, and tatooing are common.—S. Caruana (*from* Trop. Dis. Bull.)

Edelman, R. Malnutrition and leprosy—an analytical review. Lepr. India **51** (1979) 376–388.

I agree with Skinsnes (1964) that the long incubation period of leprosy and its chronicity, once established, do enhance the possibility that acquired factors, such as malnutrition, could interpose and modulate the immune response. However, with all facts assembled, no convincing evidence exists for a strong modulating effect of malnutrition in human leprosy. A few observations show effects on morbidity of leprosy only under the most extreme condition of nutritional deprivation. Although careful nutrition assessments of leprosy patients have not been done, most leprosy patients seem not to be severely clinically malnourished, and it is not at all clear if mild to

moderate malnutrition, such as growth retardation in children, affects the risk of infection or the course of their disease. My prejudice is that it either does not or that the nutritional effect is overshadowed clinically by other and more forceful risk factors. However, research will be required to settle this issue more definitively.—Author's Summary

Gold, C. H. Renal amyloidosis in Blacks. S. Afr. Med. J. **56** (1979) 715–718.

In a retrospective study of renal amyloidosis in a large general hospital, only 7 cases were found. Patients generally presented with nephrotic syndrome and symptoms of fluid overload; hypertension on presentation was unusual. Renal failure was present in 5 out of 7 patients, and uremia in 3. The disease was secondary in 5 cases (secondary to leprosy in two cases) and primary in 2, and the prognosis was uniformly poor.—(*Adapted from* author's summary)

Malik, S. K., Kher, V., Kaur, S. and Kumar, B. Cough reflex in leprosy. Indian J. Chest Dis. **20** (1978) 149–153.

Cough reflex in response to inhalation of irritant aerosols has been tested in 27 patients with leprosy, and results were compared with 20 healthy controls. The cough response was observed to be impaired in the patient group. It is postulated that vagal afferent fibers mediating the cough reflex are affected in leprosy.—Authors' Summary

Michelson, J. B., Roth, A. M. and Waring III, G. O. Lepromatous iridocyclitis diagnosed by anterior chamber paracentesis. Am J. Ophthalmol. **88** (1979) 674–679.

A 34-year-old man with a three-month history of intraocular inflammation after ocular trauma with a fir branch, had an acute unilateral fulminant iridocyclitis. The iris had a thick, gray, cheesy membrane composed of nodular lepromata. The patient denied a history of Hansen's disease, despite the dermatologic and facial features that suggested the diagnosis. Anterior chamber paracentesis and scleral nodule biopsy demonstrated *Mycobacterium leprae*. The iridocyclitis resolved after treatment with dapsone, corticosteroids, and rifampin.—Authors' Summary

Mocelin, A. J., Ajzen, H., Ançao, M. S., Stabile, N. E., Sadi, A., Maluli, A. M. and Ramos, O. L. Kidney transplantation in leprosy. A case report. Transplantation **28** (1979) 260–261.

A patient with long-standing lepromatous leprosy and secondary renal amyloidosis is described. A three antigen-matched kidney from his brother was transplanted with immediate establishment of normal kidney function. After an early post-operative uneventful course, he experienced one episode of rejection, managed with steroids and azathioprine. At the time of the article, the patient continued to be bacteriologically negative in spite of high doses of steroids and azathioprine. The authors conclude that kidney transplantation should be encouraged in leprosy patients with chronic renal insufficiency.—(*Adapted from the article*)

Nuti, M., Tarabini, G. C., Tarabini, G. C. L. and Thamer, G. L'antigene *e* (HB_eAg) nella lebbra. (The *e*-antigen in leprosy.) Quad. Sclavo Diagn. **13** (1977) 393–403. (in Italian)

From a consideration of all the data so far collected by various workers, it can be said that the occurrence of HB_sAg does not differ between lepromatous and tuberculoid leprosy patients, nor does the occurrence differ from that in the rest of the population, though there is a positive correlation between this incidence and the climatic and environmental conditions of the groups studied, HB_sAg being more frequent in patients mostly deriving from tropical countries and closed communities, on whom most of these observations were made. The investigation here reported deals with the incidence of HB_eAg, this antigen being said to be in direct and close relation with infectivity and with the persistence of the B virus in the circulation.

Sixty-six samples of serum from 42 patients with lepromatous and 24 with tuberculoid leprosy, in Somalia, were examined. HB_sAg and its antibody were radioimmunologically assayed and the Ouchterlony

immunodiffusion method was used for HB_eAg and its antibody. HB_eAg was not found in any case; HB_eAb was found in 3 cases of lepromatous leprosy. HB_sAg was found in 10 cases of lepromatous and in 3 of tuberculoid leprosy. HB_s antibodies were found in 16 cases of lepromatous and in 10 cases of tuberculoid leprosy. The 3 patients with HB_eAb also carried HB_sAg. There was no relation with age or sex. The absence of HB_eAg suggest that these carriers present a low degree of risk or none at all. It appears persons with a depressed cell-mediated immunity reaction tend to acquire the B virus antigen more easily and with more difficulty to show the corresponding antibody.—E. Agius (*from* Trop. Dis. Bull.)

Ochsner, P. E., Hausman, R. and Olsthoorn, P. G. M. Epithelioma cuniculatum developing in the neuropathic ulcer of leprous etiology. Arch. Orthop. Traumat. Surg. **94** (1979) 227–231.

Epithelioma cuniculatum is a distinctive tumor of the sole of the foot with characteristics of a low-grade carcinoma. A case is presented, the pertinent literature reviewed, and its possibly frequent development in leprous patients discussed.—Authors' Summary

Pernambuco, J. C. de A., Opromolla, D. V. A. and Tolentino, M. M. A artrite na reação hansênica. (Arthritis in Hansen's disease.) Hansenologia Internationalis **3** (1978) 18–29. (in Portuguese)

Twenty-one patients with Virchowian hanseniasis from the Hospital Lauro de Souza Lima (Bauru-SP), were clinically studied in order to establish the type of arthritis that occurs in erythema nodosum hansenicum (ENH). For this form of joint involvement in hanseniasis, the authors suggest the name "reactional arthritis." Patients with evidence of other rheumatic diseases were not included in their investigation.

Reactional arthritis may precede, accompany, or follow the appearance of ENH or polymorphous lesions, but in approximately half of the cases studied they were absent. Arthritis generally has an acute beginning and may be monoarticular, oligoarticular or polyarticular, symmetrical, or asymmetrical. Relapses of articular manifestations occur frequently. Arthralgia, constitutional symptoms, hepatomegaly, generalized painful lymph node enlargement, peripheral neuritis and other clinical manifestations were observed. The laboratory and radiological findings, however, were not specific. During the period of this study (maximum—30 months), relapses of articular manifestations were common, with a tendency for the ENH lesions to become more discrete or no longer present. In no case did the articular manifestations continue nor did they provoke sequele.

The paper discusses the differential diagnosis of reactional arthritis with gout, traumatic arthritis, septic arthritis, osteomyelitis, osteoarthritis, sickle-cell anemia, rheumatic fever, and diffuse connective tissue diseases. It emphasizes that in any study of articular involvement in hanseniasis, the possibility of its association with other rheumatic diseases should be excluded. On the other hand, reactional arthritis should be considered in the differential diagnosis of rheumatic diseases.—Authors' Summary

Reza, K., Talib, S. and Imam, S. K. o-Diphenoloxidase concentrations in leprosy. Br. Med. J. **2** (1979) 900–901.

o-Diphenoloxidase activity was studied in 15 patients with lepromatous leprosy, 15 with tuberculoid leprosy, and 15 controls. o-Diphenoloxidase isolated from skin and serum samples of patients with lepromatous leprosy had the specificity of a bacterially derived enzyme and not that of a mammalian-derived enzyme. Only the patients who had had lepromatous leprosy for over two years showed enzyme activity in serum though all showed it in skin tissue.

o-Diphenoloxidase activity in serum may be a useful diagnostic marker of lepromatous leprosy.—Authors' Summary

Rostant, M. Dégénérescence épithélioma-teuse des plaies, ulcères et maux perforants plantaires chez les lépreux. (Epitheliomatous degeneration of sores, ulcers, and plantar ulcers in persons with leprosy.) Acta Leprol. **73** (1978) 29–38. (in French)

Six cases of epitheliomatous degeneration, of which five were spino-cellular and one was baso-cellular, occurred in leprosy patients showing sores, ulcerations, and plantar ulcers and are quoted in this study.

The authors underline the favorable part of the defects of cellular immunity for leprous pathogenesis and the need of using histological exams systematically when noticing any continued delay of cicatrization. An immuno-stimulating medication should be used for any leprosy patient showing obstinate trophic ulcerations.—Author's Summary

Sengupta, U., Ramu, G. and Desikan, K. V. Assessment of Dharmendra antigen. II. Standardization of the antigen. Lepr. India **51** (1979) 316–322.

Dharmendra antigen with different bacterial counts (16, 12.5, 10, 7.5, 5 and 2.5 million/ml) have been utilized for determination of skin delayed hypersensitivity in leprosy patients. It has been noted that antigen with 10 million acid-fast bacilli (AFB)/ml mounts a standard early (24 hr) as well as late (3 weeks) reaction in patients. Lepromatous patients do not show any skin reaction with this dilution. Thus, a standard Dharmendra antigen has been prepared using a considerably smaller number of organisms as compared to the international standards for Mitsuda antigen.—Authors' Summary

Sheskin, J. and Yaar, I. Motorische Leitungsgeschwindigkeit der Kubitalnerven bei Patienten mit Leprareaktion. Zusammenfassung einer dreizehnjährigen Beobachtungsreihe während der Thalidomidbehandlung. (Motor transmission velocity of the cubital nerves in patients with lepra reaction. Compilation of a 30-year series of observations during treatment with thalidomide.) Hautarzt **30** (1979) 376–379. (in German)

The motor conduction velocity of the ulnar nerves was examined repeatedly in 34 patients with lepromatous leprosy. In patients with active lesions the reduction in velocity paralleled clinical deterioration.

In "burned-out" control patients, who had never suffered from leprosy reaction, the conduction velocity remained slow and unchanged over many years.

Twenty-six of 34 patients suffering from leprosy reaction received thalidomide treatment over a period of 6 to 13 years in order to suppress the reaction, with good effect. In none of these 26 patients were neurotoxic disturbances found.—Authors' Summary

Sinha, S., Sengupta, U., Ramu, G. and Desikan, K. V. Assessment of Dharmendra antigen. III. Comparative study with Mitsuda antigen. Lepr. India **51** (1979) 323–329.

Four fractions each from Dharmendra and Mitsuda antigen have been obtained by step-wise centrifugation and sonication of the antigen. These fractions have been assessed for their capacity of inducing skin delayed hypersensitivity responses. While it has been noted that all fractions of both types of antigens can induce a good early reaction, the late skin reaction is only mounted by intact bacilli of both types of antigen. When compared at a constant bacillary concentration, Dharmendra antigen has produced better early skin reaction than Mitsuda antigen whereas the intensity of late skin reaction is almost equal with both antigens. The hypothesis has been put forward that the early as well as the late reaction are produced by the same antigen, and this antigen is located in the protoplasm of *M. leprae*.—Authors' Summary

Smith, D. G. and Guinto, R. S. Leprosy and fertility. Hum. Biol. **50** (1978) 451–460.

There is evidence that infection with *Mycobacterium leprae* lowers fertility of some leprosy patients. To test this hypothesis, age-specific birth rates of leprous and healthy individuals were compared in a completely ascertained Philippine population in which leprosy is endemic. The fertility of lepromatous males and females after, but not before, and of females during the five years preceding the onset of leprosy was significantly lower than that of the healthy population. These differences were not seen when the fertility of those with tuberculoid leprosy was compared with that of the healthy population. The implications of these findings for discovering causes and significance of reduced fertility

of male and female victims of lepromatous leprosy are discussed.—Authors' Summary

What is your diagnosis? Indian J. Dermatol. Venereol. Lepr. **45** (1979) 229–230.

A forty year old male patient with lepromatous leprosy who was on antileprosy treatment for 8 years complained of itching on the body and scalp of 1 year's duration. There was no seasonal variation in the symptoms.

Examination revealed thick scaly lesions on palms, soles, elbows, wrists, knees, and scalp. There was a superficial generalized scaling on the rest of the body. Resorption defects of fingers and toes were also present.

A series of photographs follows.

Final diagnosis: Norwegian scabies

Norwegian or crusted scabies is well known to occur in association with lepromatous leprosy. In these patients a nonspecific lowering of immunological status is thought to be mainly responsible for this very widely disseminated infection with *Acarus scabies* var *hominis*. Large numbers of parasites can be readily demonstrated by direct microscopic examination of crusts dissolved in saline.

Involvement of scalp, face, palms, and soles are peculiarly common in this form of scabies even when it affects adults. Conventional short term therapy with scabicidal agents is inadequate for cure of this condition. Long term vigorous antiscabetic applications are necessary to eradicate the infection.—(*Adapted from the article*)

Immuno-Pathology

Alonsó, J. M., Mangiaterra, M. L. and Szarfman, A. La reacción de inmunoperoxidasas indirecta aplicada a la lepra humana. (Indirect immunoperoxidase technique in human leprosy.) Medicina (B. Aires) **38** (1978) 541–544. (in Spanish)

We report here the indirect immunoperoxidase technique adapted to the diagnosis of human leprosy (IPI-leprosy). Sera of 41 leprosy patients (33 lepromatous, 6 tuberculoid, and 2 indeterminate) and 42 blood donors were studied by this method, using 17 normal newborn sera as negative controls. A suspension of *M. leprae* was prepared from human lepromas and employed as antigen. Prior to use, the bacilli were treated for 24 hr with citrate-HCl buffer at pH 3.2 to release the gammaglobulins that may be adhered to their surface. Sera were diluted from 1/2 to 1/4096 in buffered saline at pH 7.2 with 0.3% bovine albumin, and incubated on slides for 30 min at 37°C. After three washings with saline, anti-human Ig and anti-human IgM peroxidase labelled immunosera were incubated on the slides and then revealed with diaminbencidin-H_2O_2 (sic). No peroxidase activity was detected by this method in *M. leprae*. In order to evaluate the specificity of the test, sera of various infectious diseases were studied. The cross-reaction between leprosy and tuberculosis was measured, using the IPI-leprosy and IPI-BCG tests with tuberculosis and leprosy sera, respectively. The results obtained indicate that this method is adequate for serological diagnosis and prognosis in human leprosy since good serological titers of specific antibodies were obtained without cross-reaction with tuberculosis, and specific IgM antibodies could be detected in lepromatous leprosy.—Authors' Summary

Carayon, A. Les névrites microangiopathiques dans la lèpre. (Microangiopathic neuritis in leprosy.) Hansenologia Internationalis **2** (1977) 15–23. (in French)

Besides the typical hansenic neuritis characterized by a hypertrophic nerve associated with the already well known wide range of neural impairment, there are also microangiopathic lesions. Microangiopathic neuritis has been described by the author together with Camain and Maydat in borderline and reactional (ENL) cases (1966–1969).

From the author's observations in the years 1970–1976, *primary* and *secondary*, *acute*, and *slow* varieties of microangiopathic neuritis could be identified and sys-

tematized both in borderline and ENL cases.

The clinical, immunological, pathological, and therapeutical aspects of these forms of microangiopathic neuritis are presented.—(*from* Trop. Dis. Bull.)

Convit, J., Aranzazu, N., Pinardi, M. and Ulrich. M. Immunological changes observed in indeterminate and lepromatous leprosy patients and Mitsuda-negative contacts after the inoculation of a mixture of *Mycobacterium leprae* and BCG. Clin. Exp. Immunol. **36** (1979) 214–220.

This investigation was carried out to study the possibility of eliciting favorable immunological changes in small groups of Mitsuda-negative patients with indeterminate leprosy, lepromatous patients who were bacteriologically negative after prolonged treatment with sulfones, and in Mitsuda-negative contacts by means of stimulation with a mixture of autoclaved tissues from *Mycobacterium leprae*-infected armadillos and living BCG.

A radical change was observed in the specific immunological activity of the indeterminate group, all of whom initially had occasional bacilli in cutaneous nerves in biopsies taken from hypopigmented spots, and in the persistently Mitsuda-negative contacts. The 48 hr and 30 day reactions to lepromin, the 48 hr reaction to supernatant antigen from lepromin, the test for bacillary clearance and *in vitro* lymphocyte transformation (LTT) to *M. leprae* from human and armadillo lesions all became positive.

Of the lepromatous patients studied, only one became positive to all the criteria mentioned above. In the others, the 48 hr reaction to supernatant antigen, the LTT to antigen from a human source, and the clearance test remained negative, while the Fernandez and Mitsuda reactions became positive.

These results are discussed in terms of the possible use of this stimulation procedure in the prevention and immunotherapy of leprosy.—Authors' Summary

Fliess, E. L., Herrera, M., Carosella, E. D., Baliña, L. M., Cardama, J. E. and Gatti, J. C. Estudios inmunológicos en pacientes de lepra indeterminada. (Immunlogical studies in patients with indeterminate leprosy.) Hansenologia Internationalis **3** (1978) 42–47. (in Spanish)

A longitudinal study was made in a group of indeterminate hanseniasis patients; immunological tests (Mitsuda's reaction and E rosettes formation) and clinical observations were performed in 1973 and in 1977 respectively. A significant difference was observed in the E rosettes formation between lepromin positive and lepromin negative patients ($p < 0.001$) in 1973; this difference increased ($p < 0.01$) in 1977.

The immune response was related to the evolution of the polar types of the disease, depending on specific treatment. Patients presenting normal values of E rosettes in 1973 showed reversal of the Mitsuda reaction, suggesting that this test could be used for prognosis.—Authors' Summary

Garcia Gonzalez, J., Almeida, J. D., Milian, L. M. and Castillo, F. de la C. Estudio de la inmunidad mediada por células a un grupo de enfermos de lepra (test de inhibición de migración de leucocitos). (Study of cell-mediated immunity in a group of leprosy patients. The leukocyte migration inhibition test.) Rev. Cub. Med. Trop. **30** (1978) 53–58. (in Spanish)

Ten leprosy patients with the lepromin-negative lepromatous form and ten leprosy patients with the lepromin-positive tuberculoid form who underwent the leukocyte migration inhibition test were studied. A marked impairment of cell-mediated immunity in the lepromatous group as well as significant differences of the average inhibition rates between both groups of patients were found. Results from this *in vitro* test were correlated to those from the lepromin skin test, and a correspondence in 18 out of the 20 patients was obtained.—Authors' Summary

Lai A. Fat, R. F. M., Chan Pin Jin, J., Diesselhoff-Den Dulk, M. and van Furth, R. *In vitro* synthesis of humoral factors (immunoglobulins and complement) in lesional skin of leprosy patients. Infect. Immun. **25** (1979) 891–895.

An *in vitro* culture technique was used to demonstrate the synthesis of immuno-

globulins and complement in lesional skin of patients representing the entire clinico-histopathological spectrum of leprosy. The results indicate that immunoglobulin G is produced in different amounts in the various forms of leprosy. Classification of the patients according to the three main groups shows that a small amount of immunoglobulin G synthesis occurred in tuberculoid leprosy, a distinct amount occurred in borderline leprosy, and a large amount occurred in lepromatous leprosy. Contrary to expectation, synthesis of C3 was found only in some of the cultures of these three forms of leprosy. The function of the locally synthesized immunoglobulin G and the findings concerning C3 synthesis are discussed.—Authors' Summary

Linder, E., Lehto, V.-P., Stenman, S., Lindqvist, K., Bjorvatn, B. and Bergquist, R. Circulating antibodies to connective tissue microfibrils and dermal immunoglogulin deposits in leprosy. Clin. Immunol. Immunopathol. **13** (1979) 1–8.

Subepidermal fibrillar deposits containing IgM immunoglobulin occur in apparently normal skin from leprosy patients. The distribution of the deposits is similar to that of the microfibrillar epidermis anchoring system, which consists of elastic fibers. The deposits may be related to the presence of a novel autoantibody reacting with connective tissue microfibrils and the microfibrillar part of elastic fibers. The antibodies were of IgM class and were found in 67 of 97 leprosy patients. They occurred in higher titer in patients classified as borderline lepromatous as compared to borderline tuberculoid patients.—Authors' Summary

Mehra, V., Mason, L. H., Fields, J. P. and Bloom, B. R. Lepromin-induced suppressor cells in patients with leprosy. J. Immunol. **123** (1979) 1813–1817.

The possibility of an active mechanism of immunologic suppression in leprosy was explored by assessing the *in vitro* lymphocyte responses of 61 leprosy patients and 30 normal individuals to the mitogen Con A in the presence or absence of Dharmendra lepromin. Lepromin-induced suppression of Con A stimulation was found in 32 of 35 lepromatous patients and 15 of 15 borderline patients but only 2 of 15 tuberculoid patients and 2 of 30 normal controls. Cell fractionation studies indicated at least two cell populations involved in the *in vitro* lepromin-induced suppressor activity, adherent cells, and Tγ-cells.—Authors' Summary

Parvez, M., Sharda, D. P., Jain, A. K., Bhargava, N. C. and Misra, S. N. A study of platelet adhesiveness in leprosy. Lepr. India **51** (1979) 363–368.

Platelet adhesvieness was studied in fifty patients with leprosy and fifteen health individuals who served as a control group. Platelet adhesiveness as determined by glass bead apparatus showed a trend towards elevation in patients with leprosy, being maximum in the reactional phase, statistically also the increase being highly significant ($p < 0.001$). The observed increase in platelet adhesiveness may be due to marked tissue destruction and vasculitis seen in leprosy patients.—Authors' Summary

Stoner, G. L. Importance of the neural predilection of *Mycobacterium leprae* in leprosy. Lancet **2** (1979) 994–996.

It is suggested that continuous leakage of bacilli into the circulation from a primary focus of intraneural infection may simultaneously initiate bacillary dissemination and the suppression of cell-mediated immunity. Both these features are essential for the development of lepromatous leprosy. Nerve involvement in leprosy, previously thought of as a diagnostic feature of the disease and as a complication of therapy, may represent an essential phase in the cycle of infection and reinfection by *Mycobacterium leprae*.—Author's Summary

Veliath, A. J., Bedi, B. M. S. and Balasubrahmanyam, M. Behaviour of macrophages to *Mycobacterium leprae*. A tissue culture study. Lepr. India **51** (1979) 330–335.

Macrophage culture was performed on 45 healthy adults who were initially categorized on the basis of their lepromin reactivity using Dharmendra antigen. There were

25 individuals in the lepromin positive group and 20 in the lepromin negative group. The cultures were challenged with *M. leprae* and the macrophages studied at varying time intervals of culture. No difference was evident in the behavior of cultured macrophages to *M. leprae* in both the groups. The lepra bacilli were phagocytosed by the macrophages and retained essentially intact until the termination of culture. The lepromin reactivity of a healthy individual was not reflected on the macrophage function *in vitro*. The observations suggested against the possibility of an intrinsic genetically determined macrophage defect in dealing with *M. leprae*.—Authors' Summary

Wager, O., Penttinen, K., Almeida, J. D., Opromolla, D. V. A., Godal, T. and Kronvall, G. Circulating complexes in leprosy studied by the platelet aggregation test. The platelet aggregation test and its relation to the Rubino test and other sero-immunological parameters in 135 patients with leprosy. Clin. Exp. Immunol. **34** (1978) 326–337.

Sera from 135 patients with leprosy were tested by the platelet aggregation test (PAT), by the Rubino test, and by other sero-immunological assays. PAT positivity (titre ≥ 10) was 53% in the lepromatous subgroups and 5% in the tuberculoid subgroups ($P < 0.005$). The higher PAT titres and Rubino titres clustered significantly ($P < 0.0005$) toward the lepromatous end of the disease spectrum. A statistically significant correlation was found between the PAT and the Rubino titres ($0.05 > P > 0.025$). Removal of the effect of the disease spectrum, however, resulted in a partial correlation between the PAT and the Rubino titres that was not significant ($P > 0.1$), suggesting different basic mechanisms for the platelet aggregation (PA) and the Rubino activity of the lepromatous sera. The correlation between the PAT titres and twenty-nine other sero-immunological parameters was calculated, and a highly significant correlation was found between the PAT and the IgG level ($P < 0.005$) and between the PAT and the antistaphylolysin-α titre ($P < 0.005$).

The PA activity in most lepromatous sera studied sedimented in the heavy (>19S) fractions and was inhibitable by IgM rheumatoid factor. It thus fulfilled the criteria for IgG complexes as defined in previous studies with known model Ag/Ab complexes and with sera from patients with immune complex states. The addition of an excess of soluble mycobacterial antigens affected the PA activity of some lepromatous sera, which suggests that the putative complexes were composed of mycobacterial antigens complexed with corresponding IgG antibody.

It was concluded that the PAT is a sensitive detector of IgG complexes peculiar to lepromatous leprosy. In leprosy the discriminatory power of the PAT seems to be superior to that of other immune complex tests recently applied for the analysis of leprosy series.—Authors' Summary

Wall, J. R., Walters, B. A. and Lessof, M. H. Studies on PBL transformation to testis in patients with lepromatous leprosy. *In: Immunological Influence on Human Fertility*, B. Boettcher, ed., Sydney: Academic Press, Inc., 1977, pp. 303–310.

Progressive testicular disease is common in patients with lepromatous leprosy. Direct invasion of germinal cells by *M. leprae* probably occurs in all cases, and acute orchitis occurs in association with lepra reaction in about 10% of patients. The authors' previous findings of serum testicular germinal cell antibodies in lepromatous leprosy patients raised the possibility of immunological mechanisms. They investigated a possible role of cell-mediated immunity to testis, as assessed by peripheral blood lymphocyte transformation in response to testis antigens, in the pathogenesis of leprous orchitis. Levels of peripheral blood "activated" T cells were also measured. Peripheral blood lymphocyte transformation to testis antigens occurred in patients with lepromatous leprosy. This finding was correlated with the clinical evidence of testicular disease. There was a small but significant reduction in the percentages of "activated" T cells in lepromatous leprosy patients compared to normal subjects. These data suggest that immune reactions against testis may play a role in the pro-

gressive testicular disease of lepromatous leprosy, and these findings raise the possibility that other tissue reactions in lepromatous leprosy, such as nerve disease, may similarly be immunologically mediated.—(*Adapted from the article*)

Microbiology

Goyle, S. and Virmani, V. *In vitro* studies on biopsies from leprosy cases. Indian J. Med. Res. **69** (1979) 919–925.

Organotypic cultures of skeletal muscle, skin, and subcutaneous fat were set from biopsies obtained from leprosy patients. This culture technique permits the growth, maturation, and survival of all the cellular elements from the respective tissues. Macrophages grew profusely in all the cultures. Intracellular acid-fast bacilli (AFB) were observed in the spindle cells and macrophages. The behavior of AFB was studied by means of subcultures. When subcultured on Löwenstein Jensen medium up to a period of 5 months, these bacilli did not show any growth.—Authors' Summary

Prabhakaran, K., Harris, E. B. and Kirchheimer, W. F. Metabolic inhibitors of host-tissue origin in *Mycobacterium leprae*. Lepr. India **51** (1979) 348–357.

It is not clear why host-derived bacteria are metabolically inert compared to organisms grown *in vitro*. o-Diphenoloxidase is the only metabolic property proven to be present in *Mycobacterium leprae* separated from infected human as well as animal (mouse and armadillo) tissues. However, highly concentrated suspensions of *M. leprae* obtained from the organs of experimentally infected armadillos showed little or extremely low o-Diphenoloxidase while the organisms bound ^{14}C-labeled dopa. When these preparations were diluted, they readily oxidized D-dopa to pigment. The activity remained unaltered by washing the suspensions with dilute alkali or acetone and ether, indicating that it is an intrinsic property of the bacilli. Treatment with different proteases relieved the inhibition and resulted in a 100% stimulation of o-Diphenoloxidase in the bacilli. Evidently, the *M. leprae* suspensions obtained from infected tissues contain an inhibitory material which is protein in nature, and the metabolic inertness sometimes observed in host-grown bacteria may not be due to loss of enzymes or metabolites from the organisms.—Authors' Summary

Ramu, G. and Desikan, K. V. A study of scrotal biopsy in subsided cases of lepromatous leprosy. Lepr. India **51** (1979) 341–347.

Scrotal biopsies were obtained from 38 cases of lepromatous leprosy who were clinically subsided and had negative skin smears. Twenty-six (68.4%) of these cases revealed bacilli in the dartos muscle. None except one showed a specific lesion in the dartos. Bacilli obtained from 2 out of 7 cases multiplied in the mouse foot pad.

Bacilli were found to be persisting in the dartos muscle despite prolonged treatment before as well as after clinical subsidence of the disease. The persisting bacilli in this situation could be a cause of relapses.—Authors' Summary

Experimental Infections

Kawaguchi, Y., Matsuoka, M., Kawatsu, K., Sushida, K. and Tanemura, M. Pathogenicity of cultivated murine leprosy bacilli of Hawaiian-Ogawa strain in mice. 4. Visceral lesions in mice produced by intraperitoneal infection. Jap. J. Exp. Med. **49** (1979) 265–271.

The pathogenicity of two substrains (HO-R and HO-S) of cultivated murine leprosy

bacilli was examined by intraperitoneal inoculation to various strains of mice (C3H, KK, BALB/c, DDD, and C57BL/6).

HO-R (Rough Form) was first isolated on 1% Ogawa's egg yolk medium from the leprous lesions produced by original Hawaiian strain (H bacilli). HO-S (Smooth Form) was dissociated *in vitro* during the 9th to 15th subculture of HO-R on the same kind of medium.

In all the mice tested, intraperitoneal inoculation with HO-R bacilli produced progressively severe visceral lesions in the manner similar to H bacilli harvested from subcutaneous leproma. The only exception was, however, in DDD strain of mice. H bacilli produced only slight visceral lesions even in the later stage of infection.

HO-S was much lower in pathogenicity than the above two strains of murine leprosy bacilli. Visceral lesions produced by intraperitoneal inoculation with HO-S were very slight in all the strains of mice except BALB/c. BALB/c strain mice were highly susceptible to intraperitoneal as well as subcutaneous infection with HO-S.

From the above observations, it is concluded that the characteristic features of pathogenicity of cultivated murine leprosy bacilli, such as mouse strain differences, are all the same regardless of infection route.—Authors' Summary

Klingmüller, G. and Sobich, E. Übertragung menschlicher Leprabakterien auf den Igel. (Transmission of human leprosy bacilli to the European hedgehog.) Naturwissenschaften **64** (1977) 645–646. (in German)

Based on P. W. Brand's clinical experience that multiplication of *M. leprae* is more pronounced in the cooler parts of the body, Shepard successfully obtained multiplication in the mouse foot pad. Kirchheimer and Storrs achieved disseminated leprosy of the multibacillary type in the nine-banded armadillo. Unfortunately, controlled breeding of this mammal in captivity has not yet been accomplished.

It seems warranted to find indigenous mammals which, like the nine-banded armadillo, develop lepromatous leprosy. This has been attempted by Lew, *et al.*, with the Asiatic chipmunk. The authors have proposed the European hedgehog (*Erinaceus europaeus*) because this species has a core temperature between 35°C and 36°C in the summer, which falls during winter hibernation to +1°C. The authors have succeeded in propagating hedgehogs for 2 generations. Two of these hedgehogs were experimentally infected with human *M. leprae*. One of them had a granuloma at the injection site 13 months afterwards, consisting of closely packed histiocytes and epithelioid cells of a dimorphous nature which contained both degenerated and intact acid-fast bacteria. In the skin surrounding the granuloma, one could see with the light and electron microscope numerous intracellular mycobacteria. No mycobacteria were seen in the lymph nodes. Due to lack of material these mycobacteria could not be identified as *M. leprae* by D-dopa oxidation, pyridine extraction, or mouse foot pad multiplication. The second hedgehog had a few acid-fast bacteria in the spleen. The authors hope that these findings might indicate incipient dissemination, but this must await future findings.—W. F. Kirchheimer

Lagrange, P. H. Active or passive acquired resistance after *Mycobacterium lepraemurium* infection in C57BL/6 and C3H/HeN mice. Ann. Immunol. (Inst. Pasteur) **130 C** (1979) 561–579.

Varying doses of living *Mycobacterium lepraemurium* (MLM) injected intravenously were able to modify to some extent the local granulomatous reaction which was induced after local challenge with the same microorganism in C57BL/6 and C3H mice. Intravenous injection with 10^6 or more living bacteria was able to facilitate the local infection in both strains. Subcutaneous immunization with 10^7 living MLM was able to limit the early phase of multiplication of a secondary challenge in C57BL/6 mice. Local and systemic transfers with lymphoid cells from immune donors were associated with an early local reaction, equivalent to a delayed-type hypersensitivity reaction and with a delay of growth of the challenge inoculum in the draining node. Later on, nevertheless, the same number of acid fast bacteria were found in controls and in adoptively immunized recipients. When these recipients were pretreated with cyclo-

phosphamide prior to the adoptive transfer, a significant reduction in multiplication was observed. Spleen or lymph node cells from MLM infected C3H mice, harvested 5 weeks after intravenous or subcutaneous infection respectively, were able to transfer an early local cellular hypersensitivity reaction but unable to modify the growth of the challenge inoculum in the draining node. Also cyclophosphamide pretreatment did not influence the onset of the granulomatous reaction or the multiplication rate of C3H mice preimmunized with 10^7 MLM injected intravenously.

Macrophage activation, measured by testing the increase of resistance to *Listeria monocytogenes*, and immunopotentiation of delayed-type hypersensitivity to sheep erythrocytes after MLM infection, given either subcutaneously or intravenously, were observed in C57BL/6 but not in C3H mice.

Thus, it is concluded that after subcutaneous injection with an optimal dose of MLM, responsive C57BL/6 mice are able to mount a specific acquired resistance associated with hallmarks of cell-mediated immunity such as macrophage activation and cellular hypersensitivity. On the other hand, C3H mice receiving the same immunizing dose are able to mount a cellular hypersensitivity but unable to acquire a specific and a non-specific resistance. Thus the form of cellular hypersensitivity in these two strains of mice after MLM infection are different in nature.—Author's Summary

Rea, T. H., Lieberman, J., Carmel, R. and Walsh, G. P. Serum angiotensin-converting enzyme, transcobalamin and lysozyme in normal and lepromatous armadillos. J. Reticuloendothel. Soc. **26** (1979) 367–372.

Serum angiotensin-converting enzyme, unsaturated vitamin B_{12}-binding capacity, and lysozyme values were measured in 8 healthy armadillos, 2 with *Mycobacterium ulcerans* infections, and 15 with lepromatous leprosy. Mean angiotensin-converting enzyme values were significantly elevated in animals with lepromatous leprosy, and the degree of the elevation roughly paralleled the extent of the infection. Unsaturated B_{12}-binding capacity values were higher than those previously reported for any mammalian species but were unrelated to the presence or extent of lepromatous leprosy. Only negligible amounts of lysozyme activity could be found. Serum angiotensin-converting enzyme assay may be of value for evaluating armadillos for natural or experimentally induced lepromatous leprosy.—Authors' Summary

Epidemiology and Prevention

Argellies, J. L. Incidence de la maladie de Hansen en Martinique. Analyse épidémiologique critique des modes de dépistage. (The incidence of leprosy in Martinique. An epidemiological analysis of case-finding methods). Bord. Méd. **11** (1978) 2775–2786 (in French)

This useful paper is based on a critical analysis of case-finding statistics in the West Indian island of Martinique and attempts to draw conclusions concerning the most effective measures that ensure a maximum detection rate in a population of relatively low leprosy incidence. The situation is complicated by the release from in-patient treatment in a leprosarium of numbers of patients who were subsequently responsible for a real increase in the number of new cases.

The value of clinical examinations of selected groups of schoolchildren for signs of early leprosy is unquestioned, but is it worth the expenditure of time? The answer is that this procedure may disclose about a quarter of those suffering from leprosy in the same and comparable groups but that the patients discovered in this way will be suffering from indeterminate rather than from lepromatous leprosy.

The author names and defines indices of success in case-finding and shows that active case-finding surveys will bring to light patients with very obvious signs of leprosy

who would otherwise not report themselves to clinics or seek treatment for their leprosy.

[In several respects the situation in Martinique is far from typical (for instance, the increased incidence of new cases in older people and the two-humped curve of incidence), but the conclusion that many undetected sources of contagion exist is undoubtedly true elsewhere. It may be that three-quarters of the cases of active leprosy remain undiagnosed, unregistered, and untreated in a stable population like that of Martinique despite costly efforts at case-finding in a sizeable proportion of the population.]—S. G. Browne (*from* Trop. Dis. Bull.)

Chiewsilp, P., Athkambhira, S., Chirachariyavej, T., Bhamarapravati, N. and Entwistle, C. The HLA antigens and leprosy in Thailand. Tissue Antigens **13** (1979) 186–188.

HLA—A and —B locus antigens were determined in 170 unrelated patients with leprosy and 100 healthy controls. There were no statistically significant deviations from expected antigen distribution in patients with any of the various forms of leprosy though the number of patients studied is relatively small. There were some interesting trends, particularly a possible decrease in the number of tuberculoid patients with A9, and an increase in the proportion of lepromatous patients with B18 and B40.

Limited evidence of a genetically controlled predisposition to the clinical manifestations of leprosy suggests that further studies with extended typing should be carried out on the HLA haplotype segregation in informative leprosy families. These should provide a clearer indication of the relevance of the HLA (including DR) and possibly of other non-HLA loci to the possible mechanism(s) of disease susceptibility.—Authors' Summary

de Vries, R. R. P. and van Rood, J. J. HLA and infectious diseases. Arch. Dermatol. Res. **264** (1979) 89–95.*

The sum total of these studies is then compatible with the assumption that the immune response both humoral and cellular to viral, bacterial, and parasitic infections, and the incidence or severity of the ensuing infections is at least in part controlled by genes in the MHC. How these genes exert this influence is, however, only partly elucidated. Thus, although the existence of Ir genes in the MHC and their relevance for infectious disease seems to be highly likely, the mechanisms by which they do so to a large extent elude us.

Information on this point might provide us with a new insight not only into the factors which determine the outcome of an infectious disease but also into the pathogenesis of non-infectious diseases, including skin diseases.—(*Adapted from the article*)

* Editor's Note: The article reviews the authors' extensive work with leprosy as well as other diseases.—RCH

Hitzeroth, H. W., Walter, H., Hilling, M. and Munderloh, W. Genetic markers and leprosy in South African Negroes. II. Erythrocyte enzyme polymorphisms. S. Afr. Med. J. **56** (1979) 507–510.

The phenotype frequencies of the erthrocyte enzyme polymorphisms acid phosphatase (aP), phosphoglucomutase loci 1 and 2 (PGM_1 and PGM_2), adenylate kinase (AK), adenosine desaminase (ADA), esterase D (EsD), and 6-phosphogluconate dehydrogenase (6-PGD) were determined on a sample of 234–248 South African Negroes with leprosy. These results were compared with data of 841–997 healthy Negro controls of similar geographical and ethnic origin in order to determine whether or not any association exists between specific phenotypes and the manifestation of leprosy. A part of the data included in the present study was compared with the data of a similar comparative analysis on Mozambican Negroes. With regard to the polymorphisms aP, PGM_1 and PGM_2, the results derived from South Africa and Mozambique exhibit reverse patterns of deviations from the null hypothesis. From this it does not appear justified to postulate an association between these genetic markers and the occurrence of leprosy. For the enzyme polymorphisms ADA, AK and EsD (data are confined to South African Negroes only) the distribution of phenotypes between patients and controls was very

similar. The differences were not statistically significant. However, observations on the 6-PGD polymorphism (data are confined to South African Negroes only) showed an excess of phenotype PGD A among leprosy patients as compared with controls. The difference was statistically highly significant. Further studies based on additional samples are required to substantiate whether or not the statistical outcome reflects a true association between this phenotype and leprosy.—Authors' Summary

Leiker, D. L. Epidemiologie van lepra in Nederland in de periode 1945–1975. I. (Epidemiology of leprosy in the Netherlands during the period 1945–1975. I.) Ned. Tijdschr. Geneeskd. **121** (1977) 1338–1340. (in Dutch)

In the period 1945–1975, two immigration waves, the first mainly in the first decade from Indonesia, the second mainly in the last decade from Surinam, have resulted in a total of nearly 1100 registered patients. In 30% of the patients, the first symptoms appeared during or after the year of immigration. The incidence of new patients developing the first symptoms after immigration rapidly decreased from 254 in the first 4 years after immigration to 48.17 and 7, respectively, in the following 4 year periods.

In the Ambonese (Indonesian) population (number of patients = 47; prevalence = 1.5/1000) who arrived around 1951, in the last 15 years only one new patient was found. In the Indo-European population (number of patients = 267; prevalence = 0.9/1000), who arrived between 1946 and 1964, in the last 5 years only 2 new patients were found. Apparently, leprosy has ceased to be endemic in these populations.

In the immigrants from Surinam, who mainly arrived in the last 15 years (number of patients = 581; prevalence = approximately 4.5/1000), many new patients were found to have the disease after arrival. The first signs of the disease appeared in 55.6% before the age of 15 versus only 20.5% in the Indo-Europeans. No significant shift of the age of onset to higher age groups was found in patients from Surinam in the last 20 years. This suggests that the rate of transmission in Surinam has not significantly decreased. Recently, the anti-leprosy activities in Surinam have increased, and it is expected that results will become noticeable in the next 5 years. It is expected also that the course of leprosy in the immigrants from Surinam living in the Netherlands will become similar to other immigrant groups and that within the next 10–15 years leprosy will become a rare disease.

Of the Dutch patients (number = 101; prevalence = 1.4/100,000), all but one were infected abroad in endemic countries. The origin of infection in the single patient who had never left the Netherlands could not be traced.

In the other groups, two children of patients born in the Netherlands developed leprosy. In 5 patients who had lived abroad, the first symptoms of the disease developed 15–20 years after immigration, and in 2 patients this period was 23 and 35 years, respectively. In these patients, infection occurring in the Netherlands is possible but not certain.

It is concluded that in the Netherlands leprosy behaves as a virtually non-contagious disease.—Author's Summary

Leiker, D. L. Epidemiologie van lepra in Nederland. II. (Epidemiology of leprosy in the Netherlands. II.) Ned. Tijdschr. Geneeskd. **121** (1977) 2098–2102. (in Dutch)

The lepromatous rate in Dutch, Indo-European, Ambonese, and Surinamese patients was 35.6%, 34.6%, 28%, and 18.8%, respectively. The percentages of borderline patients do not differ greatly (range: 16%–20%).

The prevalence of leprosy in patients from Surinam is about 5 times as high as in Indo-Europeans, but the prevalence of lepromatous leprosy is only two and one-half times as high. The difference in prevalence is largely a difference in tuberculoid leprosy, mild forms in particular. This may have to be explained by differences in the incidence of tuberculosis.

The paucity of secondary cases in the Netherlands cannot be explained by lack of sources of infection. Of the 273 lepromatous and 196 borderline patients, many were infectious due to lack of treatment, relapse due to abstention from treatment, or to drug resistance.

Segregation of patients was not practiced. In the very densely populated Netherlands, numerous infectious patients have moved freely in crowded streets, public transport, factories, etc.

These facts are a strong argument against the hypothesis of primary foci in the respiratory tract after droplet infection. It does not exclude, however, the nasal and throat mucosa as the most important site of exit of *M. leprae*. Undoubtedly, countless bacilli have spread in the environment after coughing and sneezing.

Better hygiene in general and better nasal hygiene in particular are important. Fortunately, handkerchiefs are normally used, and spitting is regarded as ill behavior. Better hygiene of the body, house, clothes, tools, floor, and streets and more constant protection of the body through the use of clothes and shoes, as compared with most endemic countries, are important factors for the prevention of penetration of *M. leprae* into the body—Author's Summary

McNeeley, D. F. A case of leprosy at Charity Hospital, New Orleans. South. Med. J. **72** (1979) 758–759.

A 63-year-old black woman, admitted to Charity Hospital, New Orleans, for treatment of hypertension and congestive heart failure, was found clinically and histopathologically to have Hansen's disease. She had lived most of her life in Orleans Parish and had no known contact as a source of her infection.—Author's Summary

Nobrega, R. C. and Mascani, M. Aspectos epidemiológicos da hanseníase na região do Vale do Paraíba—São Paulo. (Epidemiological aspects of hanseniasis in the region of the Paraíba Valley—São Paulo.) Hansenologia Internationalis **3** (1978) 62–75. (in Portuguese)

The "Paraiba Valley," a Division of the Public Health Service of the State of S. Paulo, Brazil, corresponds to the Third Administrative Region of the State. Its surface area is 14,291 square kilometers, and its population is estimated at 1,000,000 inhabitants. All data referring to hanseniasis patients since the beginning of the Service in 1929 are given. The present prevalence is high (2:1000). A study was made in detail of the Sanitary District of the municipality of Taubaté from 1967–1976, focusing on the increasing yield of indeterminate cases through examination of contacts. The significant increase of the percentage of patients who spontaneously seek out the Service is also noteworthy. Those facts are attributed to the end of compulsory isolation and to the results of destigmatizing activities, especially through the use of a new terminology.—Authors' Summary

Smith, D. G. The genetic hypothesis for susceptibility to lepromatous leprosy. Hum. Genet. **50** (1979) 163–177.

Evidence for genetic influence of the host response to infection with *Mycobacterium leprae* is reviewed. A complex segregation analysis is performed on data for 91 families from Mactan, Philippines, in each of which at least one offspring developed lepromatous leprosy. The data are not found to be inconsistent with an autosomal recessive hypothesis for susceptibility to lepromatous leprosy. Heritability estimates in the range of 80% were calculated for sib-sib pairs under the multifactorial hypothesis for susceptibility. It is argued that the multifactorial hypothesis is more in keeping with available immunologic, epidemiologic, and demographic data than is the single gene hypothesis.—Author's Summary

Vinet, J. La lèpre dans l'Empire Centrafricain. (Leprosy in the Central African Empire.) Afrique Méd. **16** (1977) 365–367. (in French)

The anti-leprosy campaign started in 1953. The prevalence rate reached a peak in 1958 (6.53/1000), thereafter declining rapidly till 1966 (2.94/1000) and regularly since (about 1.00 in 1975). While the endemic is widespread, the prevalence rates vary in different parts of the country, being high (6.28 to 9.97) in the east and central area, moderate (4.37 to 5.12) in the west-central area, and low (under 4.7) in the west and north.

Children account for about 15.68% of the cases. Since 1953, 74,485 patients have been registered, and of these 37,927 have been released from treatment and control.

It is considered that while the numbers of patients no longer requiring treatment

are very satisfactory, the newly registered cases (over 1000 annually) indicate that transmission is still occurring. More intensive case-finding is advocated, with admission to one of the five hospitals of all patients with lepromatous or reactional tuberculoid disease. A long-acting sulfonamide (sulphamethoxypyridazine, or Fanasil) is the drug of choice at present, but rifampin and clofazimine are being introduced.—S. G. Browne (*from* Trop. Dis. Bull.)

Rehabilitation

Brown, H. and Getty, P. Leprosy and thumb reconstruction by opponensplasty or phalangizing the first metacarpal. J. Hand Surg. **30** (1979) 432–438.

The article discusses management of two patients with thumb complications of leprosy. The two methods of treatment used were: 1) opponensplasty, in which the extensor indicis proprius tendon replaces opposition function in median and ulnar palsy; and 2) replacement of thumb loss by phalangizing the first metacarpal.—(*Adapted from the article*)

Campos, M. P. Contribuição para o tratamento do mal perfurante plantar na hanseníase. (Contribution towards the treatment of plantar ulcers in hanseniasis.) Hansenologia Internationalis **3** (1978) 59–61. (in Portuguese)

The structure and functions of the normal and of the hansenic foot are described. The pathogenesis of plantar ulceration is discussed as well as its conservative and surgical treatments.—Author's Summary

Campos, M. P., Margarido, L. C. and Rodriguez, F. N. Incidência das deformidades da mão na hanseníase. (Incidence of deformities of the hand in hanseniasis.) Hansenologia Internationalis **3** (1978) 55–58. (in Portuguese)

A study of the hands of 360 hanseniasis patients of the Virchowian type showed that muscular atrophy is the most common deformity and that reabsorption of the left minumus is the rarest. Reconstruction and plastic surgery are effective only in early cases. A continuous and systematic education of patients still is the basic measure.—Authors' Summary

Enna, C. D. and Dyer, R. F. The histomorphology of the elastic tissue system in the skin of the human hand. Hand **11** (1979) 144–150.

This study compares the effectiveness of the Verhoeff and Puchtler-Sweat resorcin fuschin methods of staining the elastic tissue of palmar and dorsal skin specimens of the human hand.

The resorcin fuschin stain demonstrates the "oxytalan" fibers of the elastic tissue system in the dermal papillary layer of the palmar skin. Oxytalan fibers are not generally demonstrated by the Verhoeff method and are not demonstrated in the dorsal skin specimens.

These studies substantiate the existence of a system of elastic tissue fibers in the skin of the hand. The interrelationship of the elastic and collagenous fibers appears to complement each of their functions; namely, in anchoring the dermo-epidermal junction, absorbing the stresses of stretch and compressive forces and returning the tissues to their original state of tension, and providing protection to the dermal appendages in addition to lending a gradient mobility transmitted through the dermis to the subcutaneous layer to give suppleness and mobility to the skin.—Authors' Summary

Gupta, R. C., Nathani, D. and Gupta, K. K. Modified water-air mattress in the management of bedsores. Indian J. Med. Res. **70** (1979) 289–298.*

A water filled air mattress has proved to be very effective and useful in the prevention as well as treatment of bedsores. It provides flotation, thus reducing the contact pressure on the susceptible areas of the body such as the occiput, shoulders, sa-

crum, greater trochanter, and the heels. Deep breathing, coughing, or slight movement performed by the patient generates a rippling effect in the mattress and changes the pressure distribution of the entire body surface in contact with the water mattress. The mattress is easily available, economical, comfortable, and simple to use. It has only a few mechanical failures, which are easily repairable. As turning in bed is hardly required, it reduces the load on the nursing staff and ward attendants.—Authors' Summary

* Editor's Note: This is of interest for leprosy patients with skin anesthesia who frequently experience bedsores at bed rest.—RCH

Kuppusamy, P., Richard, J. and Selvapandian, A. J. A study of causes of unemployment among agricultural labourers afflicted by leprosy. Lepr. India **51** (1979) 369–375.

One hundred sixteen patients, consisting of 54 males and 62 females, all engaged in agriculture, were interviewed to find out the cause of their unemployment. Deformity seemed to be the major factor responsible for the loss of job among them, which was prevalent in the advanced age group (males—age 50, females—age 53.5). Since the measures to rehabilitate them are rather difficult, it is essential to educate them on the methods of prevention of deformities and their importance. If not, they invariably lose their job at an age when they cannot train themselves for a suitable alternative job to earn their livelihood.—Authors' Summary

Oommen, P. K. Ulnar nerve decompression by medial epicondylectomy of the humerus and a method of assessing muscle power status by totalling the muscle grading. Lepr. India **51** (1979) 336–340.

This paper advocates the principle of ulnar nerve decompression by medial epicondylectomy of the humerus in leprosy patients presenting with ulnar nerve neuritis and early muscle weakness of ulnar nerve supplied muscles. Sixteen medial epicondylectomies were done on 14 patients and a follow-up showed relief of nerve tenderness and an improvement in the motor power status of the muscles as shown by total grading.—Author's Summary

Teixera, A. C. Correção do perfil facial nos hansenianos. (Correction of facial profile in persons with leprosy.) Rev. Assoc. Med. Bras. **21** (1975) 124–126. (in Portuguese)

The author relates the modifications of the facial profile of leprosy patients caused by deformity of the nose associated to the absorption of the anterior part of the upper jawbone. The reconstruction of the nose was carried out with the flaps recommended by R. Fariña. During the same surgery it is possible to increase the advancement of the maxilla either by silastic or Gillies' epithelial inlay method, which may also be very successful if we have a good prosthesis that would be able to substitute the mold for a definite prosthesis one month after the surgery.—Author's Summary

Other Mycobacterial Diseases and Related Entities

Dias, M. H. de P. and Hayashi, A. Prova tuberculínica, BCG oral e infecção tuberculosa em crianças menores de 5 anos. (Tuberculin test, oral BCG vaccine, and tuberculosis infection among children aged under 5 years.) Rev. Saúde Pública **12** (1978) 443–454. (in Portuguese)

Results of tuberculin reaction from PPD Rt 23, 2UT are reported on children under one year of age and children from one to four years of age who were registered in the Pediatric Clinics of the Hospital das Clinicas of the College of Medicine of the State University of São Paulo. The study was carried out from 1971 through 1975. In a group of 665 children under one year of age, 3.15% were weak reactors while 6.62% were strong reactors, and in a group of 1298 children between one to four years of age, 0.69% were weak reactors while 5.5% were strong reactors. The relationship between prior BCG oral vaccination and positivation to the tuberculin test in the two age groups

was studied, thus obtaining information about the previous oral BCG vaccination. Likewise, in 575 children under one year of age and 1113 children one to four years of age, a positive relationship between the previous oral administration of BCG and the positivation to the tuberculin test was found. In analyzing the relationship between the number of doses of previous oral BCG administration and the results of the tuberculin test by the Goodman method, it was found that the proportion of children who had taken three or more doses of BCG by oral administration and showed strong reaction to the tuberculin test is significantly greater than that observed for the non-reactors, a fact which does not hold true for the one to four age group. For the children who had taken one or two doses there was no significant statistical difference.—(*from* Trop. Dis. Bull.)

Erickson, S. B., Kurtz, S. B., Donadio, J. V., Jr., Holley, K. E., Wilson, C. B. and Pineda, A. A. Use of combined plasmapheresis and immunosuppression in the treatment of Goodpasture's syndrome. Mayo Clin. Proc. **54** (1979) 714–720.*

Five consecutive patients with well-documented Goodpasture's syndrome were treated with plasmapheresis and immunosuppression. In all patients, the antiglomerular basement-membrane antibody titers decreased with treatment. In three patients, hemoptysis responded promptly to plasmapheresis. Two patients presenting with severe renal failure required chronic dialysis, and three patients who had serum creatinine levels less than 2.1 mg/dl before treatment improved or had stabilization of their renal function. We confirm that the use of plasmapheresis and immunosuppression is a promising method of treatment in some patients with Goodpasture's syndrome.—Authors' Summary

*Editor's Note: Such treatment in ENL or Lucio's phenomenon would be of considerable interest. See also Bourgeois-Droin, Ch., *et al.*, Nécroses cutanées étendues au cours d'une lèpre lépromateuse en pousée réactionelle. (Extensive skin necrosis in lepromatous leprosy in reactive exacerbation), an abstract of which is on p. 87 of this issue.

Fonseca, L. de S. and Gontijo Filho, P. P. Micobactérias atípicas isoladas de material humano na cidade do Rio de Janeiro. I. Identificação preliminar pela morfologia colonial. (Atypical mycobacteria isolated from human sources in Rio de Janeiro I. Preliminary identification of colony morphologies.) Rev. Microbiol. (São Paulo) **9** (1978) 125–130. (in Portuguese)

Colony characteristics of 144 strains of atypical mycobacteria isolated by the Laboratório Centrale de Tuberculose do Rio de Janeiro, mainly from sputum of patients suspected of having tuberculosis, were analyzed. The colony morphologies on transparent albumin oleic agar medium have shown 72% correlation with biochemical identification, suggesting this procedure as an aid in presumptive identification of mycobacteria.—Authors' Summary (*from* Trop. Dis. Bull.)

Fonseca, L. de S. and Gontijo Filho, P. P. Micobactérias atípicas isoladas de material humano na cidade do Rio de Janeiro. II. Identificação bioquímica e espectro de resistência aos tuberculostáticos. (Atypical mycobacteria isolated from human sources in Rio de Janeiro. II. Bacteriological study and drug susceptibility test). Rev. Microbiol. (São Paulo) **9** (1978) 149–155. (in Portuguese)

One hundred forty-four stains of atypical mycobacteria isolated by the Laboratório Centrale de Tuberculose do Rio de Janeiro, mainly from sputum of patients suspected of having tuberculosis, were analyzed by biochemical tests and drug susceptibility testing. The majority of atypical strains were identified as Runyon's group II strains (36.1%). Next in frequency came group III organisms (32.7%) and rapid growing mycobacteria (25.7%). Other isolates were photochromogens (5.5%). About half the strains studied appeared to be potential pathogens belonging to the species *Mycobacterium fortuitum* (18.0%), *Mycobacterium scrofulaceum* (16.6%), *Mycobacterium avium-intracellulare* (11.1%), *Mycobacterium kansasii* (5.5%), and *Mycobacterium tuberculosis* (0.7%). Of 73 strains checked for drug resistance, 53 (73%) were found to be multiple drug resistant (INH, SM, and PAS), which is similar

to the findings of other workers.—Authors' Summary (*from* Trop. Dis. Bull.)

Hazen, P. G. and Beno, M. Management of necrotizing vasculitis with colchicine. Arch. Dermatol. **115** (1979) 1303–1306.*

Six patients with necrotizing vasculitis were treated with oral colchicine as part of an open study. Four patients with cutaneous vasculitis and normal levels of serum complement and one patient with vasculitis associated with Behçet's syndrome demonstrated clinical improvement while receiving colchicine. One patient with cryoglobulinemia, hypocomplementemia, and cutaneous vasculitis showed no response to colchicine therapy. In three patients, clinical improvement persisted after its withdrawal. Colchicine may be effective in controlling cutaneous necrotizing vasculitis and Behçet's syndrome through its effect on polymorphonuclear leukocyte function.—Authors' Summary

*Editor's Note: Colchicine in ENL?—RCH

Mascaro, J. M., Lecha, M. and Torras, H. Thalidomide in the treatment of recurrent, necrotic, and giant mucocutaneous aphthae and aphthosis. Arch. Dermatol. **115** (1979) 636–637.

This Letter to the Editor describes excellent results with thalidomide in the treatment of recurrent and necrotic mucocutaneous aphthae (Behçet's syndrome). Thalidomide was administered in a daily dose of 100 mg, and on the second or third day the aphthae were painless, and they healed in seven to ten days. Most of the patients could stop the medication after 7 to 12 days. Two patients had active arthritis, which showed no improvement while taking thalidomide. The authors state that they have no experience with the efficacy of thalidomide in the noncutaneous symptoms of Behçet's syndrome.—(*Adapted from the letter*)

Mendes, E. Transfer of delayed hypersensitivity to leishmanin (Montenegro reaction). Cell. Immunol. **42** (1979) 424–427.

Delayed hypersensitivity to leishmanin was transferred to 7 out of 12 recipients by the intradermal and subcutaneous injection of lymphocytes from leishmanin-positive donors. After successful transfer, the skin test was still positive 11 to 32 days later.—D. S. Ridley (*from* Trop. Dis. Bull.)

Nagpaul, D. R. Tuberculosis in India—a perspective. J. Indian Med. Assoc. **71** (1978) 44–48.

Tuberculosis is known to have existed in India since time immemorial but very little is known about its nature, distribution, and spread until recent times.

The author quotes the results of surveys made between 1955 and 1968 which show that tuberculosis morbidity is largely confined to older age groups, that prevalence in rural areas is similar to that in urban areas, and that infection and disease rates (18% and 0.4% respectively) are widely divergent from one another. He takes these findings to indicate that the epidemic in India is waning or has become endemic.

Information about mortality rates, although deficient and unreliable, suggests that since the turn of the century they have followed a similar pattern of decline to that reported, for example, in Czechoslovakia since 1880, where the statistics are reliable.

There is evidence that in India, especially in the last 25 years, tuberculosis has changed gradually from being a more acute and extensive disease in the young to a more chronic, less extensive disease in the elderly. Moreover, complications are seen less often. This too is evidence of a declining epidemic.

Surveys from Delhi and Bangalore are quoted from which it is inferred that a gradual but slow natural decline in tuberculosis is going on. This may easily be affected locally by drought or famine, but such adverse effects on morbidity and mortality must not be accepted as evidence of a reversal of the trend of tuberculosis to decline naturally in India.

The question is posed whether the present slow decline of the epidemic can be hastened by tuberculosis control programs. The author believes that they can have little influence over a short period and cannot succeed without an accompanying marked rise in living standards.

The estimated effect of a control program

in an average Indian district would be a 4.8% annual decrease in sputum-positive cases over and above the natural decline. Improved case finding would produce a quicker decline. BCG vaccination to be really useful must be given correctly and constantly cover a high proportion of susceptible persons in the community.—E. G. Caldwell (*from* Trop. Dis. Bull.)

Rey, J. L. and Villon, A. Les mycobactéries d'origine humaine isolées en 1975 et 1976 à Bobo-Dioulasso (Haute Volta). (Mycobacteria of human origin isolated in 1975 and 1976 in Bobo-Dioulasso (Upper Volta). Méd. Afr. Noire **25** (1978) 331–334. (in French)

The authors report the species and antibiograms of mycobacteria isolated from human sources during 1975 and 1976 in Bobo-Dioulasso. The paper should be consulted for details of the laboratory techniques employed and the antibiotic resistance patterns of the strains tested.

In 1975, from 2129 specimens, 429 isolates of mycobacteria were obtained, and 38 were identified. Of these, 26 (68%) were designated *Mycobacterium tuberculosis* and 12 (32%) *M. africanum* (*M. tuberculosis* var. *africanum*). In 1976, from 281 positive cultures, 44 were identified, 29 (67.4%) as *M. tuberculosis* and 15 (32%) as *M. africanum*.

The incidence of resistance to a number of antituberculous drugs was investigated. In 1976, antibiograms of 46 isolates comprised of 27 strains of *M. tuberculosis*, 10 of *M. africanum* and 9 unidentified mycobacteria were determined. Resistance to isoniazid (INH) was found in 19.5%, and to streptomycin in 23.9%, while 21.7% were resistant to both drugs. Resistance to other antibiotics was tested on only 31 strains. Of these, 12.9% were resistant to PAS, 35.4% to ethionamide, 25.8% to thiacetazone and 3.2% to pyrazinamide.

In view of these findings the authors are unable to suggest any new therapeutic regimens, but they believe that the administration of INH and streptomycin should be restricted.—M. J. Marples (*from* Trop. Dis. Bull.)

Trofimov, G. K., Autenshlyus, A. I. and Timofeeva, L. N. Dynamics of T and B lymphocytes in the process of infection according to quantitative cytochemical data. Zh. Mikrobiol. Epidemiol. Immunobiol. (9) (1979) 23–26. (in Russian)

Cytophotometric analysis with the use of autologous erythrocytes showed that T lymphocytes had the lowest RNA content, and poorly differentiated lymphocytes had the highest RNA content while in B cells an intermediate RNA level was observed; thus, the relative content of RNA could indicate to which particular system different peripheral blood cells belonged. In the active infectious process, irrespective of the etiology of the disease, a decrease in both relative and absolute amounts of T lymphocytes and an increase in the amounts of poorly differentiated and B lymphocytes were observed—Authors' Summary