CURRENT LITERATURE

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

[Fiji] Annual Report of the Medical Department, Colony of Fiji, 1959. Suva, Government Press, 1961.

The comprehensive report of the Makogai Central Leprosy Hospital (pp. 27-31) contains an interesting description of the island of Makogai as utilized by the hospital, besides statistical data. During the year 40 patients from the Gilbert and Ellice islands were repatriated, and 131 patients were discharged (only 3 deaths), leaving a record low of 317. It is believed that a balance between admissions and discharges is being reached. A short pilot trial of Etisul on 23 patients was a failure. "All patients reacted most strongly to the smell of the drug and protested vociferously and vehemently against being made to use it." Their fellow patients said they could not sleep in the same ward with them. No improvement, clinical or bacteriological, was seen in 4 months. Ciba-1906 (DPT) was given to 8 inactive but persistently positive lepromatous patients for 9 months, all of whom became negative in 3 months with no side-effects.—H. W. W.

Carranza Amaya, A. Datos sobre la endemia de la lepra en El Salvador, C. A. [Data on the endemicity of leprosy in El Salvador, Central America.] Dermatología **5** (1961) 40-51.

This paper deals with the growing importance of endemic leprosy in El Salvador. The number of cases discovered by the author during his field trips has been increasing annually. The methods of fighting leprosy, namely, ambulatory treatment and the ferreting out of contacts, are discussed briefly. The advantage of integrating leprosy services with the general public health services is stressed. From the study of 185 cases it is concluded that the dangerous threat of constantly-increasing endemic leprosy necessitates adequate measures.—[From author's summary.]

Elliot, G. B., Freigang, B., Brown, N. L. and Wilt, J. Leprosy in Canada. Canadian Med. Assoc. J. **84** (1961) 776-780.

Leprosy does not now exist in indigenous form in Canada, but with the great increase in international travel cases are arriving with which physicians are not familiar, as they would be if they presented the classical leonine face or mutilated extremities. A case report demonstrating failure of the profession to diagnose a typical case of advanced leprosy is presented. A student set off from Calcutta on a motorcycle to tour the world, visiting many countries and making numerous television appearances, interspersed with six hospital admissions, without his condition being recognized. He had clawed hands with glove and stocking anesthesia and various other signs including trophic ulcers of the feet and a soft, circular, reddish bacteriologically-positive plaque. Although he had been seen by doctors of many nations, diagnosis was not made until he was examined by one of the authors who had previously seen a case of leprosy. (It was reported possible to infect amnion and monkey-kidney cells in tissue culture with bacilli from this patient, but attempts at passage failed.) Regarding the origin of the indigenous Canadian cases, two theories are mentioned: (*a*) infected French sailors from the ship "Indienne," wrecked in 1758 at the mouth of the Miramichi, spread the disease to the local fisherfolk; (*b*) infected French settlers from the "leprous district" of St. Malo, Normandy, brought the disease with them. Whatever the origin, the disease has become extinct save for imported cases. Of the 21 cases known in Canada in 1959, 12 were Chinese, 3 were Russian, 2 were French-Canadian, and one each was Japanese, Lithuanian, British-Canadian, and Irish-

Canadian. Sixteen are at home as outpatients. In the last 50 years, no secondary case has ever developed in Canada, with the solitary exception of an immigrant family group.—J. A. ROBERTSEN

MARIANO, J. O desenvolvimento da campanha contra a lepra em Minas Gerais. [The development of the campaign against leprosy in Minas Gerais.] Arq. mineiros Leprol. **20** (1960) 87-278.

This is a report of the campaign against leprosy in Minas Gerais which had been started three years before as a part of the national movement of the same nature. The state is divided into 9 *setors* (sections) each headed by a leprologist, and each of these sections is composed of several subdivisions (GT's). According to a table prepared by the National Service, there were 454 municipalities in the state, with a total of 424,055 sq. km., and a population of 7,409,524. Of these, 90.5% of the municipalities had been brought under the scheme, and 90.9% of the inhabitants. Of 7,128 known cases of leprosy, 6,118 (85.8%) were under observation, and 24,538 contacts. Individual reports from the many subdivisions, with commentaries by the chiefs of the sections, make up the bulk of this massive report.—H. W. W.

DOULL, J. A. Leprosy. *In* Preventive Medicine in World War II, Vol. V: Communicable diseases transmitted through contact or by unknown means, Chapter IV, pp. 25-36. Edited by J. B. Coates and E. C. Hoff, Washington, D. C.: U. S. Government Printing Office, 1960, pp. 530 + xxiii, $5.75.

The geographic distribution of leprosy and the relatively small chance of contact with sources of infection, even in highly endemic areas, limit the military importance of this disease. However, 32 veterans, mostly born in nonendemic areas, are known to have developed leprosy after the Spanish-American War. Their ages on admission to the National Leprosarium (average 52 years) also suggested exposure during Army service. Army service in World War I seems to have had no relation to leprosy infection, whereas there are records of 69 cases in individuals who served in the Armed Forces during World War II: 60 from the Army, 7 from the Navy, 1 from the Marine Corps (not including 2 tuberculoid cases reported but not registered at the Federal Leprosarium) and 1 from the Coast Guard Service. Data of these patients, particularly regarding likelihood of infection in service, are discussed at some length. The experience of the Army after the Spanish-American War, it is said, is a strong indication that the leprosy history of World War II is not yet closed, and that sporadic cases among veterans may be expected to appear during the next two decades. During the period of World War II significant progress was made in the therapy of leprosy, particularly important being the discovery that prolonged treatment with sulfones gives favorable results in a large proportion of cases.—[From author's summary, supplied by J. A. Robertsen.]

MONTOYA FERNANDEZ, R. Lepra de Lucio. [Lucio leprosy.] An. Fac. Med. Lima **43** (1960) 551-592.

This is a careful study of the Lucio phenomenon, of which there were 5 cases among 472 lepromatous patients in the San Pablo leprosarium in Peru (where there were 589 patients). The 5 cases had vesicular-ulcerous-hemorrhagic phenomena, presented in 3 primary diffuse lepromatous cases and 2 nodular cases, all in advanced stages of the disease. Two of the cases previously showed a reactional outbreak with ordinary nodules and macules and marked general symptoms, and the general Lucio phenomena were grafted on top of these; the other 3 cases only had the Lucio phenomena. Two of the cases had only one reactional outbreak, two cases had two, and one had only a small cycle of subentrant attacks. The clinical lesions which constitute this syndrome were identical in all cases. The vesicles are irregular in shape, of wine color, some soft, and confined to certain parts of the body. The ulcers, which are superficial and only reach the con-

nective tissue in some cases, generally take the forms and distribution of the vesicles; they are not very bloody. It is indicated that the immunologic phenomenon of Medina was present. The essential histologic element of the Lucio phenomenon was found by the author to be a nonspecific necrotizing acute vascularitis which accompanies a leprotic periarteritis. Although it is generally believed that the Lucio phenomenon indicates extreme gravity, in the author's experience these phenomena presented in advanced lepromatous cases and varied from fairly grave to fairly benign. For therapy he used the sulfones and INH, with satisfactory results on the specific lesions, disappearance of the Lucio phenomenon and the lepra reaction itself, partial reabsorption of the infiltrations, progressive attenuation of the successive reactional outbreaks, even up to the point of the loss of the ulcerous-necrotic character, and improvement in the general condition. The author thinks that these cases seen among lepromatous patients fit into the picture of Lucio leprosy, for various reasons, and he speculates regarding the causation of the phenomenon. Sulfone therapy has altered for the better the evolution of the Lucio phenomenon, restoring the cases to normal progress.—[From abstract in *Leprosy Rev.* **32** (1961) 297-298.]

RAMU, G. and NAGARAJAN, V. Biochemical investigations in reactive states in leprosy. Licentiate **11** (1961) 89-98.

The authors studied the levels of serum total lipids, cholesterol, and copper (erythrocytic and plasma) in 19 reactive cases of leprosy (13 of which were lepromatous, 4 tuberculoid, 1 borderline and 1 reactional tuberculoid). The levels of lipid and copper were determined both during and after reaction. Twelve healthy individuals were examined as controls. The average findings in the lepromatous cases and controls in mgm./% were as follows:

	Lepromatous cases		
	During reaction	*After reaction*	*Healthy controls*
Serum lipids	872.30	585.85	614.00
Copper			
Erythrocyte	191.62	122.61	101.10
Plasma	100.00	82.00	85.20
Cholesterol	119.62	160.00	186.00

The authors conclude that hyperlipemia and cupremia (erythrocytic) are encountered during reactions, but cholesterol levels do not change appreciably in individual cases.—N. MUKERJEE

RAMU, G. Reaction in leprosy; a study of 79 cases. Licentiate **10** (1961) 369-382.

In this article the author studied the general incidence of reaction, its frequency with respect to age, sex, season, diet, concomitant infections, and sulfone therapy of the patient. Signs and symptoms and the pathology of reaction in different types of leprosy are described. Laboratory findings with respect to serum proteins (albumin, globulin, lipoprotein), blood cholesterol, lipoids, phosphatides, erythrocytic cholinesterase and copper, histamin (in skin and blood) are briefly mentioned. Treatment of the condition with drugs like potassium antimony tartrate, calcium gluconate, ACTH, cortisone, phenylbutazone, Sandostein, Benedryl, vitamin C, B_1, D, Camoquine, Chloroquine, Diamox are briefly described. Various complications that may arise during reaction are listed. Regarding his own study, out of 418 cases reactions were encountered in 79 (18.8%); the largest number, 52 cases, occurred in the 161 lepromatous cases. The incidence was decidedly lower in younger age groups than in older ones. In 15 cases reactions were found before sulfone therapy was instituted, and in 62 after it. They were encountered most commonly during the first 18 months of treatment. In summarizing, the author suggests the possible role of metabolic disturbance of lipids in the causation of reaction.—N. MUKERJEE

Walzer, R. A. and Nataro, F. R. Lepromatous panniculitis. Arch. Dermat. **84** (1961) 960-963.

In a report in which it is said that "true erythema nodosum is not uncommonly associated with lepromatous leprosy," the authors report a case in which lesions of lepromatous panniculitis were the presenting symptoms of the disease, without other skin lesions. The patient, an adult white male from Colombia, febrile (101°F), was hospitalized with many discrete and confluent tender, erythematous, indurated nodules on the extensor aspects of the thighs, the flexor surfaces of the legs, and a few smaller but similar lesions on the forearms. A biopsy of one on the knee revealed in the dermis edema, with patchy areas of fibrosis and acute inflammatory cellular reaction. There was a granuloma at the border of the dermis and subcutis, the description of which is consistent with lepromatous leprosy, which extended into the subcutis in perivascular distribution. Acid-fast bacilli were demonstrated in this tissue, and also in scrapings from the earlobes and the nasal mucosa. A patch of hypoesthesia was found on the left foot, and slit-lamp examination of the eyes revealed tiny nodules along the course of the corneal nerves. About two months after he was started on Diasone treatment he presented several new nodular lesions, and a month later was again hospitalized in lepra reaction. Several of the "cutaneous" nodules on the thighs were then soft and fluctuant, and ropy, yellowish material with bacilli was aspirated from one of them. The acute condition rapidly subsided under prednisone treatment, but subsequently reactions recurred and the patient was sent to Carville.—H. W. W.

Canizares, O., Costello, M. and Gigli, I. Erythema nodosum type of lepra reaction. Arch. Dermat. **85** (1962) 29-40.

The authors report 3 typical cases of persistent, repeated ENL reactions seen in New York in patients from Puerto Rico, Portugal and the Dominican Republic, and then explore some aspects of the nature and the pathomechanism of the condition, its prognostic significance and management, with special reference to long-term treatment with corticosteroids. The cases described were chronic, and were followed-up for some years, during which time they had repeated reactional attacks which were controlled with difficulty and sometimes only with corticosteroids. It is remarked that the reaction cases seen had usually been given "rather high doses" of sulfones at the beginning of treatment. Case 1, who had had a series of reactions, and had spent some 5 years at Carville where she had cleared up under 1 tablet of Diasone a day, promptly developed a new reaction when a New York dermatologist gave her 3 tablets of DDS a day. Case 2 had his first reaction after his dosage of Diasone had been increased to 3 tablets a day. The authors believe that long-continued treatment with the corticosteroids is harmful, decreasing the patients' ability to react to other medications and aggravating their leprosy. At the end of an interesting discussion, the senior author said that their use is justified as a means of continuing the antileprosy therapy, and not as a type of "appeasement medication" just to control the reaction.—H. W. W.

Heldeman, M. D., and Skolnick, M. Erythema nodosum and pulmonary tuberculosis in two sisters. Arch. Dermat. **84** (1961) 402-403.

While an association of tuberculosis with erythema nodosum is recognized in Scandinavia and Britain, the relationship is not frequently noted in the United States. "Of late, however, as the ethnic make-up of the East Atlantic states has changed with the increase of Puerto Rican immigration, there are occurring changes in disease states not previously noted." The authors then describe the occurrence of ENL in two sisters of Puerto Rican origin who were diagnosed as having pulmonary tuberculosis, although neither was bacteriologically positive and both showed only low-grade tuberculin reactivity. Trial periods on sulfonamides and salicylates did not cause an exacerbation of the

nodules; on bed-rest and antituberculosis therapy the nodules slowly regressed and none remained after a 7-week period. Histologically the lesions showed hyperkeratosis and acanthosis of the epidermis, moderate inflammatory reaction in the deep corium and subcutaneoues layer, and edematous blood vessel walls with thickened endothelium. There was an infiltrate of round cells, histiocytes, and occasional Langhans giant cells, plus areas of beginning necrosis. In their comments the authors state that in all diseases in which the erythema nodosum syndrome is produced, it seems to be an antigen-antibody reaction of the delayed type, i.e., due to cell-fixed antibodies as opposed to a circulating type of antibody. With respect to its pathology, "erythema nodosum appears to be a vasculitis in the subcutaneous tissue, and [it] may in a broad sense be considered as an allergic vasculitis due to an antigen-antibody reaction of the delayed type."—J. A. ROBERTSEN

PRICE, E. W. Plantar ulcer in leprosy: A review of the literature, 1890-1960. Leprosy Rev. **32** (1961) 108-116.

This article is a summary review of the literature on the subject, about which little was written before 1930; the modern literature begins with a clinical study by Bechelli and Guimaraes in 1938. It is stated that the condition is found mainly in the tuberculoid and borderline kinds of leprosy. The recent conference at Vellore stated that "If the present state of knowledge is properly applied, plantar ulcer need not occur in leprosy." Appended is a bibliography of some 100 references.—H. W. W.

RAMU, G. Diabetes and leprosy. Licentiate **11** (1961) 316-317.

The association of the two diseases is dealt with from the aspects of clinical features, complications, and management. The author says that secondary infection of trophic ulcers may activate a latent diabetic condition. In a limited study of 6 cases, the mean fasting blood sugar level (in mgm./100 cc.) was found to be 81 in untreated leprosy cases, 69 in cases under prolonged sulfone therapy, and 75.5 in control cases. Clinically, neuritic pain, paralysis of individual nerves without thickening and tenderness of regional nerves, trophic ulcer not healing with routine treatment, and unfettered and frequent lepra reaction should raise a suspicion of diabetes as a complicating factor. Complications like osteoporosis, secondary glaucoma, ischemic neuropathies, and pulmonary tuberculosis may be encountered in both diseases. Regarding management, dietetic regulation and insulin for diabetes and chemotherapy for leprosy are advocated. In case of lepra reaction, the chemotherapy for leprosy is to be stopped but treatment for diabetes continued. Corticosteroid is not to be used for the control of reaction under such circumstances. Secondary infection, if any, is to be controlled by streptomycin.—N. MUKERJEE

LANDAU, J. Vasculitis retinae in leprosy. American J. Ophthal. **51** (1961) 831-833.

A 25-year-old man with long-standing lepromatous leprosy which had affected the eyes but had long since been bacteriologically negative, suffered from vasculitis retinae (Eales' disease). That condition is an ophthalmologic entity regarded as a clinical sign occurring in such diseases as tuberculosis, sarcoidosis, Buerger's disease, syphilis, diseases of the hemopoietic system, allergy and local infections. It had not previously been described in leprosy. A thorough search for other causes in this patient did not reveal signs of any of the above-mentioned conditions, only those of leprosy. It was therefore thought not unlikely that the eye condition was "associated with the leprosy," presumably because of the local presence of bacilli or allergy to their presence elsewhere.—F. SAGHER

TERENCIO DE LAS AGUAS, J. Lesions cutáneas de estructura tuberculosa en enferma de lepra. [Cutaneous lesion of tuberculous structure in a leprosy patient.] Rev. Leprol. Fontilles **5** (1960) 113-126.

Report of a case of a cured female lepromatous patient who was vaccinated with

BCG twice and who now presents on the forearms a few lesions clinically of tuberculous aspect and texture. The patient was Mantoux positive, and presented a general picture of *febrícula,* asthenia and anorexia. The diagnosis was based on clinical and histopathologic findings, and confusion with various other diseases is ruled out. The questions of interrelationships and biologic correlationships between leprosy and tuberculosis are discussed, especially from the immunoallergic point of view, including the use of BCG as an auxiliary element in the prophylaxis of leprosy. This leads to the conclusion that "tuberculosis, or tuberculosis vaccination, elicits a positive Mantoux reaction which can be considered as paraspecific, but which probably is useful only in the sense of demonstrating a more or less complete immunity against the leprosy bacillus." It is possible that BCG vaccination may revive some latent tuberculous focus. Coincidence of both diseases in one individual has been observed, and a consequence of this coincidence is the relatively benign character of the tuberculosis, as if side by side with leprosy, tuberculosis will assume a secondary character. Treated with a combination of streptomycin and isoniazid, the sulfone suspended, the ulcerous lesions healed, the inguinal adenitis and the *febrícula* disappeared, the patient gained weight and her appetite increased.—F. Contreras

[In the foregoing abstract the diagnosis of skin tuberculosis in the new lesions is accepted without substantiating details, without confirmation by culture or animal inoculation, and without mention for differential diagnosis of the "reversal reactions" with tuberculoid lesions known to occur in cured lepromatous patients; and for these reasons the original article has been examined. It appears that the first BCG vaccination (1957) was oral, and did not cause change in the negative Mitsuda and Mantoux reactions. The second vaccination (1958), which caused both reactions to become positive, was intradermal and produced a large, deep ulcer (photograph) which took three months to heal. A full year later, there appeared high on the forearms—almost as high as the cubital fossae—small, ulcerating lesions without any aspect of tuberculoid leprosy recognizable in the photograph. The biopsy report described in the dermis: "a dense infiltration of epithelioid cells and Langhans giant cells, disposed in follicles surrounded by lymphocytes, with abundant caseation necrosis" and without acid-fast bacilli. (This condition is supposed to be demonstrated by a low-power photomicrograph which, actually, is so out of focus that it is only a blur.) On the basis of the morphology of the lesions, and the description of the histopathology, it must be conceded that in all probability the condition was tuberculous.—Editor.]

Terencio de las Aguas, J. and Contreras Rubio, F. Un caso de enfermedad de Hodgkins simulando lepra. [A case of Hodgkin's disease simulating leprosy.] Rev. Leprol. Fontilles **5** (1960) 151-156.

The authors present a case of a Gypsy woman with Hodgkin's disease simulating leprosy, with alopecia of the eyebrows and eyelashes, marked infiltrations of the face, presence of nodosities some of which ulcerated, resembling the aspect of leontine facies of the advanced lepromatous condition. Tests for sensory changes and bacteriologic examinations of the nasal mucosa and of the skin were all negative, and the histopathology permitted diagnosis of the condition as a form of malignant lymphogranuloma of cutaneous origin.—F. Contreras

Getzler, N. A., Linton, W., and Jegyud, A. T. Atypical cutaneous tuberculosis. Arch. Dermat. **84** (1961) 439-443.

A case of "cutaneous tuberculosis" in a 39-year-old French Canadian is described, noteworthy because it began at the age of 2 years and remained undiagnosed and untreated for more than 25 years, and because the organism although cultivated remains unclassified. Following an automobile accident in 1955 there was rapid progression of

the skin disease, with the appearance of scalp lesions, and the patient lost 40 lbs. in the year before hospital admission. The skin of arm and thigh showed areas of psoriasiform desquamation, and numeroues verrucous granulomatous lesions had in some places grown to tumor-like excrudescences; some of these showed necrosis and were crusted. Typical lupus vulgaris nodules were absent. The liver was enlarged, the spleen hard, and there was some lymphadenopathy. X-rays revealed diffuse involvement of both upper lung fields, and the Mantoux test was positive to 1:1,000,000 OT; tests with histoplasmin, coccidioidin, and torulin were negative. Biopsy showed granulomatous infiltrates of the midcutis composed of histiocytes, epithelioid cells, lymphocytes, and numerous giant cells with small foci of necrobiosis, the structure being tuberculous in character. Acid-fast organisms were cultivated from skin specimens on tubercle-bacillus media, but could not be correlated with any known type. Guinea-pigs which had received 1 mgm. of bacilli subcutaneously became tuberculin positive in 24 days, but no sign of disease was noted at autopsy. Fifteen weeks after institution of therapy (details given), the deeply infiltrated areas and nodular masses regressed, abundant hair regrowth occurred, the patient gained in weight, and all signs of disease activity disappeared.—J. A. Robertsen

Knox, J. M., Gever, S. G., Freeman, R. G. and Whitcomb, F. Atypical acid-fast organism infection of the skin. Arch. Dermat. **84** (1961) 386-391.

A case of a granuloma of the skin of the elbow is described in which cultures revealed an "atypical" acid-fast organism belonging to the scotochromogen group. The problems and the present status of cutaneous infections due to atypical acid-fast organisms are reviewed. Specific granulomatous skin infections due to *M. balnei* and *M. ulcerans* are recognized. It is held possible that some granulomatous lesions of the skin which ordinarily are attributed to the tubercle bacillus may actually be caused by other mycobacteria. The increasing importance for consideration of such a possibility, and the necessity for accurate bacteriologic identification of the etiologic agent in such lesions, are stressed.—[From authors' summary.]

Rosenthal, A. M. Electrodiagnostic testing in neuromuscular disease. J. American Med. Assoc. **177** (1961) 829-833.

[With increasing use of surgical correction for loss of function in leprosy (tendon transfers, nerve transplants, etc.), the leprologist must become familiar with modern procedures used in assessing neuromuscular function. Electrodiagnostic tests have been exceedingly helpful to the clinician, but unfortunately there has been little dissemination of information on standard methods except in specialty journals. The paper here dealt with can be of service in gaining this familiarity.]

Electrodiagnostic tests may be classified as (1) stimulating tests, (2) recording tests, and (3) stimulating and recording tests. *Chronaxy determination*, discussed as an example of a stimulating test, is simple: An electric muscle stimulator so constructed that the strength of the stimulus and its duration may be varied through wide limits is used to determine first the "rheobase," which is that strength of electric stimulus acting over an infinite period of time which results in a mechanical muscle twitch. In practice, an interval of 300 milliseconds is long enough to be considered "infinite in time." Once the rheobase for a particular nerve-muscle combination has been found, the "chronaxy" can be determined. Chronaxy is defined as the duration of a stimulus twice rheobasic in strength which is necessary to produce the same muscle twitch, and is essentially an indication of the condition of the nerve-muscle pathway. Any pathologic process which impairs the ability of the lower motor neurone to conduct an impulse will produce an abnormal chronaxy. This is a gross test, indicating only substantial amounts of damage, but it has prognostic as well as diagnostic value when serial tests are made. The second type of test includes *electromyography*, not involving external stimulation. By means of

needle electrodes and accessory equipment, electropotentials of muscles are amplified, visualized with an oscilloscope (where photographic records may be made, and made audible by means of a speaker. The procedure is simple: a given muscle is tested at rest, on slight voluntary contraction, and on maximal voluntary contraction. Two important questions can be resolved, namely, is the muscle denervated? and is intrinsic muscle disease present? Changes can be detected before there is clinical evidence, and an electromyogram can provide considerable useful information. The third type of testing involves *stimulation with recording*, and is used primarily to determine nerve conduction velocity. Five nerves peripherally situated can be stimulated: the median, ulnar, peroneal, tibial, and facial. By this method, one can differentiate between disease of the axone and disease of the anterior horn cells, and one can locate any block which may exist. Thirteen references are included for those who desire to obtain details of the procedure.—J. A. Robertsen

Quagliato, R., Berquó, E. and Leser, W. Lepromatosos em tratamento sulfônico. 1. Reativações bacterioscopicas. 2. Tempo para negativação. [Lepromatous patients under sulfone treatment. 1. Bacteriologic reactivations. Time for negativization.] Rev. brasileira Leprol. **29** (1961) 19-30.

At the Campinas Dispensary, the authors studied lepromatous patients discharged bacteriologically negative from sanatoria, sulfone treatment being continued for 6 months after discharge. It was found that bacteriologic reactivation in patients registered from 1949 to 1952 and observed for 3½ to 6½ years was significantly more frequent than in those registered from 1953 to 1959. In the latter period the cumulative coefficient of reactivation ran from 0.7% in the first half year to 26.4% at 6½ years. Reactivated patients soon became negative again.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **58** (1961) 1250.]

Browne, S. G. and Davey, T. F. Diamino-diphenyl sulphoxide in the treatment of leprosy: a definite report on expanded trials. Leprosy Rev. **32** (1961) 194-202.

Since 1957 DDSO has been used at the Uzuakoli Research Unit, Eastern Nigeria, and in several neighboring leprosaria. A total of 122 patients were treated, of whom 64 were lepromatous; the dosage was about 300 mgm. twice weekly by mouth, or 100 mgm. daily. DDSO has a definite antileprosy action, giving clinical improvement in all varieties of the disease, a consistent pattern of reduction in the bacterial index, and the disappearance of morphologically normal bacilli. This improvement is similar in all respects to that obtained with DDS therapy. The side effects were also similar, namely anemia, psychosis, lepra reaction, erythema nodosum, and hepatitis; but the incidence of dermatitis was higher. Unfortunately, in a high proportion of patients who receive standard doses of DDSO over prolonged periods, a direct nephrotoxic action is seen in the occurrence of albuminuria, hematuria, and the passage of casts. This effect renders the further use of DDSO inadvisable.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **58** (1961) 1250-1251.]

Buu-Hoi, N. P., Bant, T. V., Kim Mong-Don, T. T. and Xuong, N. D. Résultats à court terme d'un traitement de la lèpre par le 4,4'-diisoamyloxythiocarbanilide. [Short-term results in the treatment of leprosy with 4,4'-diisoamyloxythiocarbanilide.] Chemotherapia (Basel) **2** (1961) 122-128.

The thiocarbanilides (thioureas) have been used in Vietnam since 1953, and later in Nigeria by Davey and his colleagues, and in both cases good results and freedom from toxicity were reported with drugs of this type. Dialide is the thiourea most used in Vietnam because of its convenience and low cost. However, its antimycobacterial activity, measured by its tuberculostatic power, is markedly inferior to one of its homo-

logues, the 4,4'-diisoamyloxythiocarbanilide. The relatively high cost of this compound caused its clinical study to be neglected, but the recent ease of obtaining it (under the name Isoxyl) has encouraged investigation by the authors. The present paper gives results of a preliminary study in 8 lepromin-negative cases over a period of six months; in a 9th case it was used for four months more and then stopped because of an attack of ENL. The dose, beginning with 100 mgm. daily, was stepped up to 400 mgm. daily. In all the cases there was marked clinical improvement, accompanied in 6 cases by bacteriologic improvement. Tolerance was excellent; 2 patients showed a pruritus in the lepromata during the treatment, and in 2 other cases there was ENL which yielded to corticosteroids, to Nivaquin, and to diminution of the dose or temporary suspension of the drug. The results have been good in both lepromatous and tuberculoid cases, regardless of whether the subjects had early or late leprosy. The action is similar to that of Dialide, and it is difficult to say which compound is the more active.—[From abstract in *Leprosy Rev.* **32** (1961) 290-291.]

ELLARD, G. A. The absorption, metabolism and excretion of 1-(p-dimethylaminophenyl)-3-(p-butoxyphenyl)-2-thiourea in man. Part 1. A study using colorimetric methods. Leprosy Rev. **32** (1961) 233-248.

Details are given of a colorimetric method for the estimation of 1-p-dimethylaminophenyl)-3-(p-butoxyphenyl)-2-thiourea (DPT) and other p-dimethylamino diphenylthioureas, and its application to the measurement of DPT and its metabolites in the urine and feces of patients receiving the drug orally. Only about 10% of an oral dose of 1.5 gm. or less is absorbed, and about 75% is eliminated unchanged in the feces. Over 99% of that part of the dose which has been absorbed is rapidly excreted in the urine in the form of benzene-insoluble metabolites. Maximal absorption of DPT occurs after a dose of 1.5 gm., and further increase in dosage does not result in a significant increase in the amount absorbed. The amount absorbed each day can, however, be increased by giving 1.5 gm. of the drug twice or thrice daily. Further increase or subdivision of the daily dose does not result in any further significant increase in the amount absorbed. The clinical importance of these findings is considered, and the implication of the extensive metabolism of DPT by man is discussed. It is suggested that for optimal therapeutic effect 1.5 gm. of DPT should be given thrice daily.—[From author's summary.]

ELLARD, G. A. and NAYLOR, R. F. The absorption, metabolism and excretion of 1-(p-dimethylaminophenyl)-3-(p-butoxyphenyl)-2-thiourea in man. Part 2. A study using ^{35}S-labelled drug. Leprosy Rev. **32** (1961) 249-258.

DPT and its metabolites have been estimated in urine and feces by radioactivity (using S^{35}-labelled drugs) and by colorimetric methods in parallel. Between concentrations of 20μgm./cc. and 500 μgm./cc., good correlation was obtained between the two methods. The radioactive method could be used to detect drug concentrations down to 2 μgm./cc. These studies have confirmed the finding that after oral administration of DPT to man only 10% of the drug is absorbed, and that that part is metabolized to benzene-insoluble compounds which are rapidly excreted in the urine.—[From authors' summary.]

GOLDMAN, L. Side effects of Ciba-1906. American J. Trop. Med. & Hyg. **10** (1961) 382.

In a trial of Ciba-1906 (diphenylthiourea) on 286 patients with various skin disorders, the treatment consisting of an average dose of 1.5 gm. daily, given for about 6 weeks, no reactions were noted at first but later generalized morbilliform eruptions, with fever, were seen in 8 out of 68 patients. These were not severe, were independent of the skin lesion, occurred during the second week of treatment, and subsided rapidly when the drug was withdrawn. Other side-effects were diarrhea, nausea and a bad taste in the mouth. No severe blood dyscrasia or visceral toxicity was noted. Although the drug was not used as extensively in this series as it has been used in leprosy, a significant number

of reactions of minor drug-allergy type occurred, and such allergy should be considered when moribilliform eruptions occur.—[From abstract by H. J. O'D. Burke-Gaffney in *Trop. Dis. Bull.* **58** (1961) 1252.]

MOLESWORTH, B. D. Preliminary note on a series of cases of lepromatous leprosy treated with Etisul. Leprosy Rev. **32** (1961) 150-152.

The new liquid form of Etisul, which is preferred to the cream, has much reduced the cost of treatment with this drug. In a trial on 22 cases in the Ankaful Leprosarium, Ghana, the usual favorable findings were confirmed. There was a rapid fall in the numbers of solid forms of the leprosy bacillus in the smears, followed by a slower reduction in the bacillus index, which, however, was well in advance of the reduction obtained in similar cases treated with DDS alone (average 40%). Solid forms disappeared in as little as 1 month, and the average time was 3 months. Clinical improvement was definite, and there was a remarkable absence of reactions, even in cases which hitherto had proved intractable. A low blood sulfone did not preclude a good response, but 3 patients showing least improvement had low blood sulfone levels. Etisul is a very useful drug to be used in conjunction with sulfone therapy, with the hope of reducing the total time of treatment.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **58** (1961) 1253.]

JAMISON, D. G. and PALMER, E. The distribution of 35S-labelled Etisul in the skin as indicated by autoradiography. Leprosy Rev. **32** (1961) 135-143.

To map the distribution of Etisul in the skin, the authors applied a preparation of Etisul labelled with 35S (S^{35}) in the treatment of 4 leprosy patients in Katsina, Northern Nigeria. Skin specimens were taken at various intervals after the inunction of the drug, and the position of the radioactive molecules was determined by autoradiography. The skin specimens were all removed from a selected standard area on the back of the forearm. The general result of the study was to show rapid penetration of the radioactive sulphur in the skin and its selective localization in the pathological zones, which parallels the clinical findings of the authors with unlabelled Etisul. In one case, in a specimen taken 3 hours after inunction, there was a large concentration of "exposed" silver particles between the hair shaft and the external root sheath close to the epidermis, possibly by passing down beside the hair shafts emerging through the epidermis. By 6 hours the radioactive particles had become concentrated in mast cells and in the connective tissue elements which composed the infiltrate. In some specimens the concentration of particles was in the position occupied by nerve bundles. Other findings suggest that radioactive particles are partly excreted in the sweat, but some may enter the blood stream to appear on the opposite side of the body after 4 hours.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **58** (1961) 1253-1254.]

VARGAS, S. Tratamiento de los estados reaccionales de la lepra con cloroquinas. [Treatment of the reactional states of leprosy with chloroquin.] Thesis, Universidad Nacional Autónoma de Mexico; Mexico, 1960.

The author discusses, in the first part of his paper, leprosy in general and also the treatment and management of the patients. With regard to lepra reaction, he describes its probable etiology, the frequency of the condition in Mexico and other countries, and its clinical aspects. These include especially the nodular, polymorphous and necrosing erythemas (the Lucio phenomenon), the prognosis and treatment of the acute stages of which are discussed. The means employed in the treatment of lepra reaction are mentioned briefly, with special reference to the chemical and pharmacologic characteristics of chloroquin. The author has treated 22 reaction cases with chloroquin (Nivaquin) for varied lengths of time, with initial dosage of 600 mgm. daily, and found it a useful drug in some cases with acute reactional states.—M. MALACARA

BRECHET, R. and COCHRANE, R. G. A study of Vadrine, alone and combined with Sulphetrone. Leprosy Rev. **32** (1961) 180-187.

The present trial of Vadrine, 2-pyridyl-(4)-1,3,4-oxidiazalone-(5) p-amino salicylate, was conducted in Angola on 40 patients from September 1955 to May 1960, and 20 of these cases wherein the lepromatous element was important are now reported on. These patients had been treated with an average period of 33 months, the average dose being 30 mgm./kgm. body weight. In lepromatous leprosy the drug had a definite action during the first 2 years, similar to or slightly better than that of DDS, but after that period little improvement was seen. In the first 12 to 18 months Vadrine has advantages in its rapid action, its lack of toxicity and side effects (and also when there is intolerance to sulfone therapy), but it is inadvisable to continue it for more than 2 years. It can be combined with parenteral solapsone (Sulphetrone) to advantage. Because drug combinations seem to be advantageous, a course of treatment suggested for an active lepromatous case would begin with Etisul for 3 months, followed by Vadrine combined with one of the sulfones for 2 years, and finally a diphenylthiourea (Ciba-1906).—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **58** (1961) 1251.]

JOPLING, W. H. and RIDLEY, D. S. Vadrine combined with sulfone in the treatment of lepromatous leprosy. Leprosy Rev. **32** (1961) 188-190.

In their previous experience with Vadrine in 7 lepromatous patients in the Jordan Hospital in England, the authors noted a promising initial response and complete absence of toxicity, but a subsequent development of drug resistance in the majority after 9-15 months of treatment. They now report on a further trial in combination with sulfone in 5 lepromatous patients. Dosage of Vadrine was increased fairly rapidly to a maximum of 40 mgm./kgm. per day. The results suggest that the combination of Vadrine and sulfone is substantially superior to sulfone alone for the first stages of treatment of lepromatous leprosy, or until the onset of erythema nodosum leprosum.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **58** (1961) 1251-1252.]

ALLAN, J. A. The treatment of lepromatous leprosy with Neovadrine and Vadrine in combination with DDS. Leprosy Rev. **32** (1961) 191-193.

This trial was conducted in the Ngomahuru Leprosy Hospital, Southern Rhodesia, on 21 lepromatous cases. The evaluation was by clinical impressions and bacteriologic studies, and a table of results is given which summarizes these features well. Neovadrine and Vadrine are related compounds. The former is 2-pyridyl-(4)-1,3,4-oxdiazalone-(5) and the latter is the p-amino-salicylate. These drugs were nontoxic when used in combination with DDS, to which they had an initial adjuvant action followed later by bacterial worsening, which suggested the emergence of resistant organisms. It seems that the ultimate duration of treatment required is not likely to be appreciably reduced compared with DDS.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **58** (1961) 1252.]

CONTRERAS DUEÑAS, F., GUILLEN PRATS and TERENCIO DE LAS AGUAS. Primeros resultados del tratamiento de la lepra con Madribón. [Early results of the treatment of leprosy with Madribon.] Rev. Leprol. Fontilles **5** (1960) 173-175.

Sulfadimetoxine (Madribon) was employed in the treatment of 4 lepromatous patients. Clinical improvement was observed in all cases, negativization in 1, and bacteriologic improvement in 2 others. Tolerance was good; the dose used was 2 tablets daily. The medicament was very effective in erysipelatoid reactions.—Authors' summary.]

TARABINI CASTELLANI, G., DIRECTOR, L. D. and MARINO, G. Tratamiento de la úlcera perforante hanseniana con el Madribón. [Treatment of the perforating ulcer of leprosy with Madribon.] Rev. Leprol. Fontilles **5** (1960) 145-150.

The authors have treated with Madribon (Roche) 50 leprosy patients who exhibited

a total of 72 perforating ulcers. The duration of the treatment was 18 days; the dosage was ½ gm. daily. The results obtained were: ulcers cured, 18 (25%); much improved, 36 (50%); moderately improved, 13 (18%); and stationary, 4 (5.5%). Only 1 ulcer worsened, and 1 patient whose old ulcer was greatly improved presented a new one. The authors comment on the polyvalent action of the new sulfonamides in explanation of the results obtained, which might have been better after a more prolonged treatment.—F. CONTRERAS

VAIDYANATHAN, E. P. Trial of a vasodilator on trophic ulcers. Leprosy Rev. **32** (1961) 144-149.

The author believes that in trophic ulcers any drug which would increase the blood flow to the affected part might promote quicker healing and for the purpose he tried nicotinic acid (Pelonin) in 15 patients with 18 ulcers. After injecting 100 mgm. into the long saphenous vein, the tourniquet was kept on for 5 minutes to prevent the drug from flowing proximally. The treatment was given 3 times a week for 5 to 60 days. A control group of 5 patients with 9 ulcers were given injections of distilled water. In 11 other patients with skin diseases the nicotinic acid was given orally every day. Results: more rapid healing in the intravenous nicotinic acid group, primary ulcers healing more rapidly. It seems that vasodilation in the healing of plantar ulcers plays a greater part than previously thought.—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **58** (1961) 1254.]

LATAPI, F. and BEIRANA, L. Tapazol en lepra; resultado negativo en diez casos. Nota previa. [Tapazole in leprosy; negative result in ten cases. Preliminary report.] Dermatología **5** (1961) 157-158.

The treatment of 10 patients with lepromatous leprosy by Tapazole in dosage increasing from 10 to 40 mgm. daily for 3 months did not produce good results.—[Authors' summary.]

ALLIS, J. B. The use of paraffin in leprosy. Leprosy Rev. **32** (1961) 167-174.

This is a paper giving practical details of the use of the paraffin bath in the physiotherapy of secondary symptoms of leprosy, for the tropical application of heat to the extremities. The method gives excellent symptomatic improvement and a certain amount of physical improvement, helping to prevent deformity. Methods and applications are described, and the formula of a suitable paraffin preparation is given.—[From abstract by J. Ross Innes in *Trop. Dis. Bull.* **58** (1961) 1256.]

LORINCZ, A. L. and PEARSON, R. W. Sulfapyridine and sulfone type drugs in dermatology. Arch. Dermat. **85** (1962) 2-16.

This report and the discussion that follows it will be of interest, especially to dermatologists, in connection with the therapy of "disorders where unusual tissue reactivity to either bacterial or tissue polysaccharides appears to play a central role in the pathogenesis of lesions." Sulfoxone (Diasone), DDS and Promacetin are the sulfones mentioned as used in association with sulfapyridine in dermatitis herpetiformis and related disorders.—H. W. W.

JAYARAJ, A. P., and CHAUDHURY, D. S. Studies on the neuro-histological changes in the Meissner corpuscle in leprosy. Leprosy Rev. **32** (1961) 153-157.

Pieces of skin from the apparently involved distal pads of the fingers of 24 leprosy cases, 14 lepromatous and 10 tuberculoid, were studied. It was found that the terminal fibers in Meissner corpuscles undergo characteristic changes in leprosy. In early lepromatous leprosy abundant bacilli occur alongside of the ramification of the nerve fibrils, and the corpuscles look almost normal; but in advanced cases bacilli are not found in the Meissner corpuscle, and the corpuscle appears slightly damaged. In tuberculoid leprosy naked fading filaments are commonly found in the corpuscle. The papilla that occupies the corpuscle is compressed, causing severe damage to the corpuscle. There is fragmenta-

tion of the ascending stem fibers which reach the papillae. In lepromatous leprosy the Meissner corpuscles tend to regain their structural and functional status, but the possibilities of this are far less in tuberculoid leprosy. [The 12 figures which illustrate this article are very useful and informative as to the histological findings.]—[From abstract by J. R. Innes in *Trop. Dis. Bull.* **85** (1961) 1248.]

TERENCIO DE LAS AGUAS, J. Epiteliomas en enfermo de lepra. [Epitheliomas in a leprosy patient.] Rev. Leprol. Fontilles **5** (1960) 165-168.

The author presents the case of a burnt-out lepromatous patient with two spinocellular epitheliomas on the face, occurring in normal tissue that had not been affected by the leprosy. The patient also exhibited several preepithelial seborrheic lesions of the face. The frequency of association of leprosy with general and cutaneous cancer is discussed, and different opinions on the subject are cited. Epithelioma in leprosy is rare, but among the reported cases 5 have been patients of Fontilles. The influence in causation of occupation with residence at Fontilles, which is situated in a region of frequent cutaneous cancer, is discussed, and also treatment of the condition.—F. CONTRERAS

PARLETT, R. C. A proposed revision of the gel double diffusion test for the detection of mycobacterial antibody. American Rev. Resp. Dis. **84** (1961) 589-591.

False positive and false negative results obtained with the gel double diffusion test [*American Rev. Resp. Dis.* **80** (1959) 153); THE JOURNAL **28** (1960) 300-304] are explained either as resulting from mistaken or missed diagnoses or as artifacts of the test itself. To minimize test artifacts the author advocates the use of a new, more complete buffer system and substitution for the agar base of Oxoid ion-agar No. 2 (Consolidated Laboratories, Inc., Box 423, Chicago Heights, Illinois). Use of at least four antigen concentrations for testing each serum specimen is strongly recommended, with ratios of 75, 50, 25, and 5 per cent in agar (by volume) suggested. The revised protocol, the composition of the reagents, and the method of interpreting the results are given. Data demonstrating the value of the revisions are presented.—J. A. ROBERTSEN

SARKAR, J. K. Isolation of diphtheroid like organisms from human leprosy nodules. Bull. Calcutta Sch. Trop. Med. **9** (1961) 111-112.

This is a brief report of cultivation work with 8 leproma suspensions planted on a number of ordinary media, and on two unusual ones: (*a*) a Seitz-filtered saline extract of peripheral nerves obtained from still-born human fetuses, and (*b*) on inspissated medium consisting of 2 parts of serum from lepromatous cases and 1 part of the nerve extract. In 2 instances there were obtained, on these media only, nonacid-fast Gram-positive diphtheroids. In subcultures they grew on other media. In 2 lepromin-negative guinea-pigs previously inoculated with these organisms, skin tests with the same lepromin gave positive reactions.—H. W. W.

MUKERJEE, N., KUNDU, S. and GHOSH, S. Immunological skin test in leprosy with an antigen prepared from a diphtheroid like organism obtained from a human leprosy nodule. Bull. Calcutta Sch. Trop. Med. **9** (1961) 112-113.

Two antigens were prepared from one of the diphtheroids reported by Sarkar (preceding abstract), and these were tested in leprosy cases, in the hope of finding an easily-obtained substitute for lepromin. One was a bacillary suspension, and the other was a three-times concentrated tuberculin-like filtrate of a culture in nutrient broth. Only the 24-hour reactions after intradermal injection of 0.1 cc. of these preparations were read, seen in a small majority of the tuberculoid cases, and also in 1 or 2 of the lepromatous cases tested. With the bacillary suspension no reactions were seen in the lepromatous

cases and only a few reactions in the tuberculoid cases. With the filtrate 1 lepromatous case was definitely positive and 2 were doubtful, while a bare majority of the tuberculoid cases (18/34) were positive. [It might have been interesting had the Mitsuda reactions been observed.]—H. W. W.

ALLISON, M. J., ZAPPASODI, P. and LURIE, M. B. Metabolic studies on mononuclear cells from rabbits of varying genetic resistance to tuberculosis. II. Studies on cells from BCG-vaccinated animals. American Rev. Resp. Dis. **85** (1962) 364-372.

Lurie having demonstrated that immunization markedly increases the physiologic activities of the mononuclear phagocytes tested *in vitro*, the authors have studied the utilization of certain metabolic substrates by peritoneal macrophages from (*a*) the most susceptible, and (*b*) the most resistant strains of rabbits at different intervals after BCG vaccination. Of the alterations of metabolism observed, it is concluded that many may be merely a reflection of the nonspecific (i.e., nonantibody) nature of the immunity in tuberculosis.—H. W. W.

SMITH, D. W. and ROBERTSEN, J. A. Immunogenicity in guinea pigs of lipid fractions of Mycobacterium tuberculosis. American Rev. Resp. Dis. **85** (1962) 398-401.

The purpose of this work was to compare the immunogenicity in guinea-pigs of PMKo (Choucroun), Wax D (Raffel), "cord factor," defatted bacillus vaccine [still acid-fast?], and BCG. All except BCG were suspended in a Bayol-Arlacel adjuvant. Only the last two were found to induce tuberculin reactivity, and only they were capable of immunizing guinea-pigs against experimental tuberculous infection. [Nothing is said in this article about acidfastness of the defatted bacillus vaccine, but in another article from the same laboratory (see following abstract) it is said that another lot of the vaccine, treated somewhat differently but equally elaborately, remained acid-fast.]—H. W. W.

ERIKSON, R. L. and SMITH, D. W. Immunogenicity of defatted mycobacteria in guinea pigs. American Rev. Resp. Dis. **85** (1962) 402-406.

It having been shown in a previous report from the same laboratory that immunizing capacity of the defatted bacilli was destroyed by extraction with acidified ether-ethanol, the study has been pursued using other means of treatment. The defatted bacilli, still acid-fast, were further extracted with alkaline ethanol (little acid-fast material remaining), with a butanol-ethanol-ether mixture (no acid-fast bacilli remaining) and by pancreatic digestion (acid-fastness not affected). The various products were all suspended in the Bayol-Arlacel adjuvant. The degree of immunity produced by 50γ of defatted vaccine in adjuvant (found to be the most favorable dose) was comparable to that produced by BCG. The residues after the further extractions were also immunogenic, despite the greatly reduced amount of acid-fastness, while the digestion with pancreatin reduced that capacity although acidfastness was retained.—H. W. W.

LARSON, C. L., RIBI, E., WICHT, W. C. and LIST, R. Skin reactions produced in rabbits by cell walls and protoplasm of *Mycobacterium tuberculosis* and *M. butyricum*. American Rev. Resp. Dis. **83** (1961) 184-193.

Here is reported an extension of previous work in which it had been found that the cell walls of *M. tuberculosis* and *M. butyricum* would produce lesions and induce hypersensitivity when injected into the skin of normal rabbits, whereas the protoplasm of those organisms had neither effect. The live cells were disrupted in a Mickle apparatus, or a pressure cell, and the cell walls and protoplasm were separated by differential centrifuging. In normal rabbits, injections of the protoplasm (100γ or more) caused transient red, edematous areas which usually disappeared within 24 hours, and when tested later—even after injections approaching 1,000γ—the animals were found not sensitized. On the other hand, injections of the cell-wall suspension (40γ or less) caused in 4-5 days raised,

hard red areas, 5-25 mm. in diameter, which persisted for 4-5 weeks and then gradually subsided. These cell-wall rabbits were found to be hypersensitized not only to the cell walls but also to the protoplasm (or, in the case of the tubercle-bacillus cell walls, to OT or PPD as well). The reactions to the cell walls then were maximal at 48 hours, and —after sufficient dosage—the lesions had necrotic centers containing a thick exudate. The cell walls were at least as active as whole bacilli in evoking lesions in both normal and sensitized animals. Animals sensitized with the cell walls of either *M. butyricum* or *M. tuberculosis* react to the same amounts of either preparation, but not to the same amounts of the protoplasm fractions; much larger doses of the heterologous protoplasm are needed, indicating a certain degree of specificity in the protoplasmic portion.—H. W. W.

STEIGLEDER, G. K., SILVA, A., JR. and NELSON, C. T. Histopathology of the Kveim test. Arch. Dermat. **84** (1961) 828-834.

Study of 165 specimens of Kveim test (KVT) lesions has shown that the reaction follows certain patterns which allow a histologic classification of the KVT as positive or negative. In some cases the granuloma consists exclusively of naked tubercles as in sarcoidosis, but in most cases necrosis with additional acute inflammatory reactions are found. Often the tubercles are not fully developed, or already show severe signs of degeneration. The KVT should be read as positive if the granuloma has the principal patterns of tubercles, even if the epithelioid cells are not fully developed or if only a few tubercles are present. Extensive necrosis and foreign body reactions due to debris of the normal structures of the skin change the tuberculoid structure considerably. If the KVT is considered questionable, additional sections at various levels of the granuloma should be made. Histologic and clinical correlation of the specimens studied shows that the KVT is both highly significant and specific when performed, removed, and examined with care. Only sixteen (16.2%) of 99 patients with obvious, proven sarcoidosis (Groups A and B) had a negative KVT, and in retrospect most of these failures could be explained by improper or inadequate technique. Only one (1.5%) of 66 cases with no sarcoidosis (Groups C, D and E) showed a positive KVT.—[From authors' summary.] [This article is the subject of an editorial note in this issue.]—H. W. W.

WIJSMULLER, G. Some implications of the addition of Tween 80 to dilutions of PPD tuberculin with respect to the study of "specific" and "nonspecific" tuberculin sensitivity; a preliminary report. American Rev. Resp. Dis. **83** (1961) 815-835.

Using the new batch of PPD tuberculin (RT23) recently released by the State Serum Institute of Copenhagen for international use, the diluent of which is a phosphate buffer containing 0.005% of Tween 80, the author has found that substance to have an effect on the reactions elicited. The Tween 80 is used as a "stabilizer," to prevent the loss by adsorption on the walls of the glass container of one—and perhaps the more specific—of the two main fractions of the tuberculin. The author has compared tuberculins with and without the Tween additive, finding that the additive enhances reactions in tuberculosis patients, but that it seems to interfere with nonspecific reactions. In the search for infected persons, therefore, it is advantageous, but it is disadvantageous in the study of nonspecific tuberculin sensitivity. [One wonders what the effect of adding Tween 80 to lepromin might be, with respect to the tuberculin-like early reaction in tuberculoid leprosy patients and normals.]—H. W. W.

ABRAHAMS, E. W. and SILVERSTONE, H. Epidemiological evidence of the presence of non-tuberculous sensitivity to tuberculin in Queensland. Tubercle (London) **42** (1961) 487-499.

In Brisbane, the proportion of children aged 13-14 who reacted to the Heaf multi-puncture test with OT was 21%, which is much higher than rates reported from southern Australian cities (2.5-7.6%). In tropical Queensland the proportions were still higher:

Rockhampton, 93%; Cairns, 41%; Ayr, 40%. After intracutaneous testing with PPD-S, the rate for Rockhampton was 52%, but elsewhere the rates were low, comparable to OT rates in southern capitals. Evidence adduced which suggests that the high incidence of sensitivity to OT in Queensland is not due entirely to human or bovine tubercle-bacillus infection includes, among other things, the generally low rates with PPD's and the absence of an excess of active tuberculosis. Reactions to the Battey PPD varied from 30% in Brisbane to 81% in Rockhampton. A survey in Cairns showed a considerable degree of cross reactions between *M. tuberculosis* and *M. fortuitum* ("yellow bacillus") PPD's. It is concluded that the high rate of sensitivity to OT may be due to infection with various mycobacteria which vary from place to place in their relative importance.—[From summary.]

Mallmann, W. L. and Lipe, R. S. An improved method for the enumeration of culturable cells of mycobacteria. American Rev. Resp. Dis. **84** (1961) 379-385.

The authors present a method for separating clumped mycobacterial cells to make uniform and relatively stable suspensions suitable for counting. The organisms are suspended in 1:5,000 Triton X-100 (isooctylphenlylpolyethoxylethanol, found better than Tween 80), by means of sonic treatment, which disperses clumps without affecting viability, enabling the suspension so obtained to be assayed by the usual drop-plate methods. For the sonic treatment it was found that a Raytheon 250-watt magnetostrictive oscillator, delivering 10 watts/cm^2 at 10 Kc for one minute, or a General Electric ultrasonic unit with a crystal diameter of 3.5 cm., gave comparable results. *M. phlei*, *M. tuberculosis* (DTA), and *M. bovis* (854) were used. The suspensions contained single bacterial cells and clumps of 2 or 3 cells, which in the cultures were regarded as bacterial units. The method has been applied successfully in evaluating bactericidal effects of various physical and chemical agents on acid-fast bacteria; it is a simple, rapid, and accurate assay method for cell enumeration. [It would be interesting to know if this treatment would disperse leprosy bacilli, whether living or heat-killed.]—J. A. Robertsen

Devignat, R. Multiplication of Hansen's bacillus in complex symbiosis *in vitro*. Nature (London) **190** (1961) 832.

A fragment of a leproma, first incubated at 25°C in phosphate-buffered saline at pH 7.0, was then transferred to a milk-egg-reductose (MER) medium. After incubation at 25° for several weeks, 1 tube (only) out of 3 showed an "exceedingly large number" of bundles of acid-fast bacilli resembling the globi of lepromatous lesions. This suggested that the contaminating microorganisms present in that tube (2 aerobes and 2 anaerobes) might have been responsible for the positive results. The same procedure was therefore applied to three other specimens which (after the preliminary buffered-saline treatment) were transferred to the MER medium after it had been inoculated with the 4 contaminants. Bundles of bacilli alternately increased and decreased in numbers several times. Secondary cultures were obtained, but further subcultivation has been unsuccessful. The author looks forward to a method for the easier preparation and standardization of lepromin.—H. W. W.

Kanai, K. The staining properties of isolated mycobacterial cellular components as revealed by the Ziehl-Neelsen procedure. American Rev. Resp. Dis. **85** (1962) 442-443.

After tubercle bacilli were broken up by mechanical procedures (the Waring blendor method), the material was separated into cell walls, intracellular particles, and cytoplasmic fluid. It was found that the cell walls were not acidfast, and retained so little of the counterstain that they appeared almost colorless. On the other hand, both the cytoplasmic fluid and the intracellular particles exhibited a strong affinity for the carbol-

fuchsin after simple washing, but they were easily decolorized by acid-alcohol and retained the methylene-blue counterstain. Further experiments with bacilli stained before they were broken up indicated that the sites of staining were inside the cell-wall structure.—H. W. W.

KAWAGUCHI, Y. Relation between the host resistance and the disease type in murine leprosy. II Report: Influence of hyaluronidase upon the development of murine leprosy. Japanese J. Bact. **16** (1961) 17-20.

In order to obtain more spreading of murine lepra bacilli in the tissue at the site of inoculation, hyaluronidase was added to the subcutaneous inoculation of a saline suspension of murine loprosy nodules in mice. The addition of hyaluronidase caused, as compared with the simple (control) inoculation, the formation of much larger ulcers which did not heal up spontaneously, but which led to death of animals of the strains originally highly resistant against the bacilli. In the originally less-resistant strains, however, there was no remarkable difference in the development of leprous changes between the animals in which hyaluronidase was added to the inoculation and those having received the simple inoculation.—K. KITAMURA

KAWAGUCHI, Y. Relation between the host resistance and the disease type in murine leprosy. III Report: Development of murine leprosy after intraperitoneal infection. Japanese J. Bact. **16** (1961) 93-97.

After the intraperitoneal inoculation of murine lepra bacilli in mice, there were not observed such marked differences, according to the strains of the animals, as had been seen after subcutaneous inoculation, in which case the development of the disease was proportional to the dose of bacilli. It seems that the differences in strains of mice with respect to the development of murine leprosy have to do with subcutaneous inoculation but not intraperitoneal inoculation.—K. KITAMURA