# 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.*

HUDSON, E. H. Historical approach to the terminology of syphilis. Arch. Dermat. **84** (1961) 545-562.

Of interest to those who have been plagued by the historical misuse of the word *leprosy*, this article traces the origins of the terminology associated with syphilis, and in doing so presents nearly six pages supporting the thesis that much of the so-called leprosy of history was in fact "endemic and epidemic treponematosis." The words *leprosy*, *boa*, *mentagra*, and *ficus* are analyzed particularly, with a view to demonstrating that endemic and venereal syphilis have been present for thousands of years in the Middle and Near East, and—since Roman times, at least—in Europe. With numerous quotations from the classics, and medical references in a number of languages, it is emphasized that words and their meanings change with time and place. The author concludes that a number of the ancient and modern terms used in connection with syphilis are cut from the same cloth, and that the origins of syphilis itself must have antedated recorded history.—J. A. ROBERTSEN

PIRINGER, W. A., PLATA, L. and MUVDI, F. Lepra in Kolumbien. [Leprosy in Colombia.] Ztschr. Tropenmed. Parasit. **12** (1961) 49-67.

The number of persons with leprosy registered in Colombia (11,183) represents 0.78 per 1,000 of the population, the provinces of Santander Sud (3.79 per 1,000) and of Boyaca (3.49 per 1,000) being the most affected. The cases are classified as lepromatous (69.9%), indeterminate (16.4%), and tuberculoid (13.6%). Most of them are treated by DDS by mouth. In 10 years 4.5% of relapses have occurred, always when the dosage employed was too high, or too rapidly progressive, or when the rest periods were too short. Dosage: from the 1st to the 15th day, 100 mgm. of DDS per day without rest; from the 16th to the 30th day, 200 mgm. per day, rest for one Sunday; after the 2nd month, 300 mgm. per day, rest 4 Sundays per month. BCG vaccination is very extensively used as a prophylactic measure. At the beginning, all healthy patients are given ambulatory treatment in the dermatologic dispensaries. All patients in a state of reaction and the invalids are hospitalized.—[From abstract by R. Chaussinand in *Bull. Inst. Pasteur* **60** (1962) 1596-1957.]

POPOV, L., GRIGOROV, I. and DIMITROVA, I. [Spread and clinical forms of leprosy in Bulgaria.] Sovremenna medicina (Sofia) **12** (1961) 3-13.

Fifteen new cases of leprosy were recorded in Bulgaria in the period between 1934 and 1960. This brought the total number of registered patients in the country for the last 85 years to 38. The greatest number of patients are in North Bulgaria. In 7 of the cases the epidemiologic investigation showed that the contamination had been transferred from abroad. The most frequent form of leprosy in Bulgaria is lepromatous. The indeterminate form is infrequent, and only 5 cases of tuberculoid leprosy were recorded.—[From authors' summary, supplied by N. Torsuev.]

SPICKETT, S. G. Genetics and the epidemiology of leprosy. I. The incidence of leprosy. Leprosy Rev. **33** (1962) 76-93.

The author, a Medical Research Council Scholar, reviews the literature relevant to the problem of genetic mechanisms in the occurrence of leprosy, in the hope of stimulating workers in the field to provide the information needed for the elucidation of these prob-

lems. The frequency of leprosy is not uniform, he points out, but the distribution of leprosy is not random. Social units in which variations occur [i.e., races, tribes, etc.] are genetically rather than politically determined. Data by Steiniger on the Acadian French community in New Brunswick suggests that susceptibility to leprosy is controlled by a single irregularly dominant gene, i.e., a dominant gene that is not fully penetrant as a heterozygote. Penetrability is calculated from the data on the same community reported by Aycock and McKinley (method of calculation given) and found to be 83.3% [perhaps]. An appeal is made for collaboration in the furtherance of studies on the influence of genetic systems on the epidemiology of leprosy.—H. W. W.

Escuder Navarro, M. Consideraciones sobre al contagio de la lepra en grupos convivientes y no convivientes. [A study of leprosy infectivity in contacts and noncontacts.] Rev. venezolana Sanit. Assist. Soc. **26** (1961) 382-385.

In the examination of a population of 71,550 persons in Bolivar State, Venezuela, in 1958, 332 leprosy patients were found. The observations led to the conclusion that, among relatives living together with leprous patients, there was 7.6% morbidity among children, 3.4% among brothers and sisters, 3.3% conjugal infection, and 1.6% among parents of patients. The chance of acquiring the disease among those living with patients but unrelated to them is about 1 to 6, compared to those who live with them and are related. The probability of finding a leprosy patient rises by 10 times when the population examined consists of those living with leprosy patients.—[From abstract by E. Muir in *Trop. Dis. Bull.* **59** (1962) 909.]

Rassi, E. and Sisirucá Quintero, C. Consideraciones epidemiológicas sobre la lepra en el Estado Nueva Esparta. [Epidemiologic considerations regarding leprosy in the State of Nueva Esparta.] Rev. venezolana Sanit. Asist. Soc. **26** (1961) 368-374.

Nueva Esparta is a state in the northeast of Venezuela. Up to 1952, when a leprosy division of the Health Service was formed, there were 107 known cases of leprosy, 83 of them of the lepromatous type. In the population examined for leprosy from 1952 to 1959 there was a total of 160 cases out of 65,508 persons examined; of these 26.9% were either lepromatous or dimorphous [borderline]. Also, 831 people in contact with these patients were tested with tuberculin and BCG vaccination was given. From the epidemiologic data recorded (8 tables) it is calculated that in the whole state there is a leprosy prevalence of 2.4 per thousand of the population.—[From abstract by E. Muir in *Trop. Dis. Bull.* **59** 1962) 908.]

Escuder Navarro, M. Estudio epidemiológico de la lepra en el Estado Carabobo (con referencia especial al desarrollo y resultado de la primera encuesta leprológica urbana efectuada en Puerto Cabello). Años 1959 y 1960. [Epidemiologic study of leprosy in the State of Carabobo (Venezuela), with special reference to the conduct and results of the first urban leprosy survey conducted in Puerto Cabello in 1959 and 1960.] Rev. venezolana Sanit. Asist. Soc. **26** (1961) 375-381.

In an antituberculosis campaign 26,860 people were examined, and 21,498 people were vaccinated with BCG. During the examinations made in the town of Puerto Cabello in December 1960, 69 leprosy patients were discovered; 45 of these were people who had abandoned treatment at dispensaries or special sanitoriums. This is an example of the method of joint control of tuberculosis and leprosy.—[From abstract by E. Muir in *Trop. Dis. Bull.* **59** (1962) 908-909.]

Katsiuba, V. T. [On the eradication of leprosy in the Republic.] Zdravookhr. Kazakh. **22** (1962) 3-6.

The author gives brief information of the geographic spread of leprosy and statistical data on the numbers of registered patients in various countries, and notes the great value of BCG prophylaxis. The following are the important measures to be taken for leprosy

control: finding of leprosy patients as early as possible; surveillance of the people in contact with them; preventive treatment; BCG vaccination of all of the population in endemic regions; and sanitary education. Among 250 children born of leprosy patients and vaccinated with BCG during a 6-year period, no cases of leprosy were found, while among the same number of nonvaccinated children 21 developed leprosy. A leprosarium has been functioning in Kazakhstan since 1929. In the city of Aralsk the inter-district antileprosy dispensary began operating in 1958, and 10 special antileprosy units in rural territories of the Aralsk and Kazalinsk regions. In these regions 80,000 persons were examined in 1957, 90,000 persons in 1960, and more than 90,000 in 1961. The number of patients found during these years was decreased to 42%. All kinds of hospitals, as well as specialized establishments (antituberculosis, sanitary, epidemiologic, etc.), are required to take part in the leprosy control work. These measures, together with the improved sanitary and hygienic conditions of life and material well-being, are the basis for the supposition that in the next 10-15 yeares leprosy in Kazakhstan will be eliminated.—N. Torsuev

Montestruc, E. and Hyronimus, J. C. Doit-on étendre, dans un pays à forte endémicité lépreuse, l'action prophylactique à la population tout entière? (Considérations immunologiques et épidémiologiques.) [Leprosy prophylaxis in countries presenting a high leprous endemicity.] Bull. Soc. Path. exot. **55** (1962) 20-24.

This paper gives the leprosy statistics in the island of Martinique (population about 250,000) for the last ten years up to 1960. In that year, in spite of the vigorous antileprosy campaign that had been carried on, 54 new cases were found, 13 of them lepromatous. The following findings are given: (1) The percentage of lepromin-positive and tuberculin-negative subjects is more than twice as much among contacts with leprosy as among noncontacts; (2) the number of subjects positive to both reactions is much higher among noncontacts (30.5%) than among contacts (4.7%); (3) the total percentage of lepromin-positive subjects is a little more in noncontacts than in contacts, and this shows the undoubted effect of tuberculous impregnation on the Mitsuda reaction; (4) leprosy infection in tuberculoid contacts, although less than in lepromatous contacts (41.3 as compared with 54.8%), is of the same importance. The conclusion is arrived at that: (1) all children should be vaccinated at birth with BCG; (2) all school children should be examined; (3) all open cases should be isolated, arrangements being made for social help and rehabilitation; (4) material help should be given to all ambulatory patients; (5) there should be periodic, careful examination of contacts.—[From abstract by E. Muir in *Trop. Dis. Bull.* **59** (1962) 982.]

Ghosal, P. A new concept of pathogenesis of leprosy. Correlation of clinical manifestations with the degree of lepromin positivity of the body. Indian J. Dermatol. **7** (1962) 52-

The reprint of this article bears, on the back page, a letter to recipient which says, in part: "Since lepra bacilli are similar to tubercle bacilli, this [article] has been designed on the accepted conception of tuberculosis as far as practicable. It explains not only the majority of clinical, bacteriological, immunological, histo-pathological, therapeutic and prophylactic observations in leprosy but clarifies certain aspects of tuberculosis also. . . . No doubt that there may be some difficulties in understanding this conception, but the writer will be glad to clarify his views whenever asked for." This reviewer, experiencing the predicted difficulties, ventures to remark that it would have been well had the author made that clarification in the article itself, preferably in the form of a proper summary. His concept appears to be that there is a sequence of: (*a*) primary infection of the skin "in subinfective dose"; (*b*) followed by a lag phase in the growth of the bacilli, during which there may develop "a certain degree of allergy and immunity with increase of resistance of the histiocyte"; and (*c*) latent infection or manifest disease according to the degree of resistance of the histiocytes. Of growth phases there are, besides lag and

logarithmic phases, also a "stationary phase (growth)" and a "declining phase (death)." The commonly observed clinical manifestations of leprosy are, it is said, due to development of either (1) *allergic* reaction against the accumulated bacterial protein, or (2) *immunity* reaction against the eliminated bacterial lipoid; or (3) *lepromatous* reaction against the eliminated active bacilli. Furthermore, there are two forms of allergic reactions, "productive" and "obstructive"; two types of immunity reactions according to whether the case is bacteriologically positive or negative; and also two types of lepromatous reaction, one "from allergic reaction" and the other "from immunity reaction." [Presumably from this range of conditions the several forms of clinical leprosy evolve. There are four detailed, full-page tabulations from which, with time, one might be able to figure out the courses of events in that respect.]—H. W. W.

MARTINEZ DOMINGUEZ, V. Early diagnosis of leprosy by study of the sweat response to iontophoresis with parasympathomimetics. Bull. Wld. Hlth. Org. **26** (1962) 227-231.

After listing the advantages of early diagnosis of leprosy cases, and discussing the difficulties of making such diagnoses, the author points out that the histamine test is not applicable with dark-skinned persons. The pilocarpin test of alteration of sweating is rather complicated, and the results not very satisfactory. Use of the iontophoresis apparatus with acetylcholine, demonstrated at the Tokyo Congress by Gay Prieto [THE JOURNAL **28** (1960) 338], is described. The results were definitely positive in 34 of 45 cases with tuberculoid or indeterminate lesions, but doubtful (in 6) or negative (in 5) in 11 cases. It was observed that in some subjects the sweat response to the iontophoresis test is very poor, and that in approximately 10% of leprosy macules no disturbance of sweat secretion can be detected by this method. [The source and cost of the apparatus are not stated in this article.]—H. W. W.

MONTESTRUC, E. A propos des rechutes chez les malades atteints de lèpre lépromateuse résiduelle. [Relapse in patients with residual lepromatous leprosy.] Bull Soc. Path. exot. **55** (1962) 346-352.

Under certain circumstances lepromatous relapses, which may sometimes be very severe, were observed in patients in whom residual leprosy seemed to be cleared up since several years, but who were still under treatment. Relapse occurred especially after BCG administration, and after genital diseases in women (particularly after repeated pregnancies). These findings show that great caution should be observed before the treatment of a lepromatous patient is stopped. Clinical, and especially immunological, supervision should never slacken. Women should be informed of the hazards of too frequent pregnancies. Although no sulfone resistance was demonstrated in such cases, it would be important to know whether other antileprosy agents (thiosemicarbazone, thiourea derivatives) might not be used in them.—[From author's summary.]

GARUS, Y. I. [Ocular leprosy and modern antileprosy therapy.] Vestnik Ophthalhmologii **75** (1962) 52-60.

Among leprosy patients hospitalized in the past decade, ocular lesions were recorded in 31.8%, e.g., 2.5 times less [sic] frequently than among all other persons examined. Since the application of modern antileprosy agents, no fresh ocular lesions have been seen to appear, while those already present ran, as a rule, a benign course, with regression of specific changes and increased vision acuity in more than one-half of the cases. Predominant were lesions of the cornea and iris (72.6 and 70.9% respectively in patients with ocular lesions). Alterations in the eye ground were met with in 5.4% of them. Exacerbations of the leprous process in the eye, which in the past usually led to deterioration of the visual power and, eventually, to blindness, have become more infrequent and less severe. Ocular exacerbations are of an allergic nature and amenable to treatment. Since

the use of sulfones has become current, no fresh or progressively developing old nodular lesions of the eye have been recorded. Successful treatment of ocular leprosy can be achieved by applying long-term, complex and regular general and local antileprosy therapy, initiated as early in the disease as possible.—[From author's summary, supplied by N. Torsuev.]

McFadzean, J. A. Proteinuria in patients with leprosy in Malaya. Trans. Roy .Soc. Trop. Med. & Hyg. **56** (1962) 404-406.

Seventy-three per cent of male patients with leprosy had some degree of proteinuria in the early morning urine specimens when admitted to the leprosy settlement. In the great majority of patients the proteinuria was intermittent. Examinations of the urines of these patients after they had been within the settlement on a first-class diet for a period of 3-4 months and after 6-12 months showed a decrease in the incidence and intensity of the proteinuria. It is suggested that the proteinuria could have been the result of a deficiency of protein in the diet before admission.—[From author's summary.]

Browne, S. G. The liver in leprosy. [Abstract of article read before the Association of Physicians of West Africa, Ibadan, Nigeria, December 7, 1962.]

The liver may be involved in all varieties of leprosy, and its functions impaired or modified both by direct bacilliary invasion and by toxemia affecting the liver cells. In lepromatous leprosy, miliary lepromatous foci occur in the cells of the reticuloendothelial system and of Glisson's capsule; typical lepra cells, with numerous bacilli in globi, are surrounded by histiocytes and lymphocytes. The serum protein level is in general raised, the albumin-globulin ratio reversed, the gamma globulin fraction increased, and the hepatic function is impaired as indicated by liver function tests. When lepromatous leprosy is advanced, or progressing, or in a reactional phase, the erythrocyte sedimentation rate is raised, as is also the level of C-reactive protein. Amyloid disease of the liver is common in long-standing leprosy, especially in America and Japan. Sera from lepromatous patients frequently give false positive reactions for syphilis, and the Middlebrook-Dubos test for tuberculosis is positive in the majority of patients with active multibacillary leprosy. In active paucibacillary leprosy, multiple tuberculoid foci are frequently present, but the serological changes are minimal and there are no clinical manifestations of hepatic dysfunction. Injudicious dapsone treatment, particularly when there is impairment of liver funtion, or when excessive doses are given, or when the maximum dose is attained too rapidly, may result in severe or even fatal toxic hepatitis, often accompanied by exfoliative dermatitis.—[From summary supplied by the author.]

Mercadal-Peyri, J., Oriol, J. and Mercadal-Peyri, J. El viraje de las formas indeterminadas a lepromatosas (a próposito de un caso recién vivide). [The change of indeterminate forms to lepromatous (concerning a case recently studied).] Leprología **7** (1962) 4-8.

A Mitsuda-negative case of indeterminate leprosy was submitted to treatment with isoniazid for two years, with apparent clinical cure. After a year without treatment he became lepromatous.—E. D. L. Jonquieres.

Andreev, V. G. [Mycoses in patients with leprosy.] Vestn. Dermatol. i Venerol. **36** (1962) 15-20.

The author has studied mycotic diseases in 635 leprosy patients in different parts of the USSR, and has found them to be more frequent in leprosy patients than in persons without leprosy. Often they occur in the "formes frustes." Epidermophytoses of the feet are often of the "fruste" and squamous-hyperkeratotic forms. Trychophytosis has a chronic character and often affects the palms and soles. Primary separated fingernail lesions were seen in 55.2% of all cases with onychomycosis. Mycoses in leprosy patients

develop mainly in the innervation zones of affected nerves. Filamentous and yeast fungi often grow in these patients, but bacteria rarely. Hypersensitivity to the fungus antigen is observed most frequently in leprosy patients. The author regards symbiosis as present between some kinds of fungi and *M. leprae*.—N. Torsuev

Zavala Saénz, A., Jonquieres, E. D. L., Fiol, H. and Capurro, E. T. Ensayo de la tolerabilidad de la difeniltiourea en enfermos de lepra. [Trial of tolerance to diphenylthiourea in leprosy patients.] Semana Méd. **120** (1962) 734-737.

Diphenylthiourea was tested, for periods ranging from 2 to 16 months, in 21 leprosy patients (15 lepromatous, 4 dimorphous, 2 tuberculoid). Except for lepra reaction in 1 patient at the beginning of treatment, there were no side effects and the drug was tolerated well. Although the trial was not long enough for an exhaustive estimate to be made, the clinical and bacteriologic results were excellent. It is believed that this drug has now passed from the experimental stage and may be safely used in a mass campaign against leprosy.—[From abstract by E. Muir in *Trop. Dis. Bull.* **59** (1962) 984.]

Dubois, A. and Limbos, P. Quelques essais du 1906 Ciba (DPT) dans le traitement de la lèpre chez l'Européen. [Some trials of Ciba 1906 (DPT) in the treatment of leprosy in the European.] Ann. Soc. Belge Méd Trop. **42** (1962) 307-320.

The authors have observed 14 leprosy patients [type not stated], most of whom had been treated without entire success by DDS, who were treated by Ciba 1906. One-half of them were old treated cases with neuritic sequelae, a few of whom could not endure DDS treatment, and the others were new cases. The drug was well tolerated after either oral or intramuscular administration. It is believed that the use of Ciba 1906 at the beginning of treatment, with the progressive introduction of DDS after some weeks, is advisable. It cannot be said whether or not Ciba 1906 will prove better than other drugs in the prevention or limitation of neural sequelae.—[In part from authors' summary.]

Mendoza, S. J., Lapenta, P., Arvelo, J. J. and Travieso, R. A. Tratamiento de la lepra con el DPT en el Sanatorio de Cabo Blanco. [Treatment of leprosy with DPT in the Cabo Blanco Sanatorium.] Rev. venezolana San. Asist. Soc. **26** (1961) 397-406.

The authors treated 68 patients with leprosy with DPT (diphenylthiourea), for periods ranging from 6 to 46 months. The patients tolerated 12 gm. of DPT without signs of toxicity, but 32% of them developed lepra reaction during the treatment. In the first months the improvement was similar to that obtained with sulfones, but those treated for 4 years were still strongly positive bacteriologically. The authors recommend use of DPT in patients intolerant of, or resistant to, sulfones.—[From abstract by E. Muir in *Trop. Dis. Bull.* **59** (1962) 909.]

Wilkinson, F. F., Manzi, R. O. and Ferrer, J. Derivado de la difeniltiourea inyectable, dosis semanal, asociada a la sulfadimetoxina en el tratamiento de la lepra. [The treatment of leprosy with diphenylthiourea associated with sulfadimethoxine in weekly injections.] Leprología **7** (1962) 65-67.

Ciba-1906 (diphenylthiourea), in weekly doses of 1 gm. injected in an oily suspension, was associated with 1 gm. daily of sulfadimethoxine. Five lepromatous patients treated for a year were improved, although the authors do not find advantages in the association of the two drugs tested since the improvement found was not superior to that obtained with either of those drugs used separately. Tolerance was excellent. No changes were found in hematic or renal picture.—E. D. L. Jonquieres

Mukerjee, N. and Kundu, S. Diamino-diphenyl sulphide on human leprosy. Bull Calcutta Sch. Trop. Med. **10**(1962) 83.

Diaminodiphenyl sulphide is effective in the treatment of human leprosy, although it

does not surpass the beneficial effect of diaminodiphenyl sulfone in this respect.—Authors' summary.

GHOSH, S. and MUKERJEE, N. Sulfamethoxypyridazine in the treatment of leprosy: Preliminary report. Bull. Calcutta Sch. Trop. Med. **10** (1962) 83-84.

A brief report of four months' treatment of 20 lepromatous and 2 tuberculoid cases, all previously untreated. There had been pronounced improvement in the lesions in all cases, and slight improvement of the bacillus indices of the lepromatous cases.—H. W. W.

WILKINSON, F. F and FERRER, J. Antipalúdicos de síntesis y otros antiparasitarios en e tratamiento de la reacción leprosa lepromatosa, tipo eritema nudoso. [Synthetic antimalarials and other antiparasitic agents in the treatment of lepromatous lepra reaction, erythema nodosum type.] Leprología **7** (1962) 72-76.

The synthetic antimalarials 7-chloro-4(4'dietilamino-1'metilbutilamino)quinoline diphosphate (Resochen) and 7-metoxi-3-chloro-9-(4-dietilamino-1-metilbutilamino acridine (Metoquina, Winthrop) and the antiparasitic and intestinal antiseptic 4.7 fenantrolin-5.6 quinona (Entobex, Ciba) were used in the treatment of lepromatous lepra reaction, erythema nodosum type. Forty-four patients were treated. All of them gave favorable and comparable results in the symptomatic action against erythema nodosum, fever, and other general phenomena. Relapses were seen after discontinuation of the drug, but they were of lesser intensity. As there is no chemical relation between the antimalarial drugs and the antiparasitic drug, further investigations are needed to explain the results.—E. D. L. JONQUIERES

WILKINSON, F. F. and FERRER, J. Un compuesto con papaína en el tratamiento de las úlceras leprosas. [Treatment of leprous ulcers with a papain compound.] Leprología **7** (1962) 68-71.

Interesting results were obtained in the treatment of leprous ulcers with a papain compound. Of 24 ulcers, 6 healed and the rest were improvd.—E. D. L. JONQUIERES

IDRISOV, A. S. [Experience with surgery on peripheral nerves in leprosy patients.] Zdravookhr. Kazakh. **22** (1962) 8-11.

During a 5-year period the author performed 100 operations on 80 patients with acute leprous neuritis. Neurolysis of the ulnar nerve at the elbow, the median nerve, the great auricular nerve, and the peroneal and tibial nerves was done with simultaneous transfer of the nerves to new muscular beds; the elbow nerve was transposed to the anterior position. In patients operated on in the acute period of neuritis, quick cessation of pains was marked, and in a fortnight infiltrations disappeared along the course of nerve trunks. In patients with paresis, atrophies and restriction in the mobility of joints, further development of these phenomena was discontinued. Various surgical interventions, the author holds, can cause lasting improvement of irreversible changes in nerve fibers. This is the best method of prophylaxis of paralysis and deformity.—N. TORSUEV

WARD, D. Footwear in leprosy. Leprosy Rev. **33** (1962) 94-105.

The importance of preventing recurrence of ulceration is stated. The mechanical factors of weight, impact, thrust and shear are outlined in relation to ulceration and means suggested of overcoming them. Certain traumatic causes of ulceration are given. Two types of shoe are described, the sandal to prevent initial ulceration and a rigid soled shoe to prevent recurrence. Hazards of shoe wearing are given and suggestions for future advances made.—[Author's summary.]

LINDERSTROM-LANG, C. U. and NAYLOR, R. F. 4,4'-Diaminodiphenyl sulphone: solubility and distribution in blood. Biochem. J. **83** (1962) 417-420.

——— ——— 4,4'-Diaminodiphenyl sulphone: binding to serum albumin. *Ibid.*, 420-424.

1. The solubility of 4,4′-diaminodiphenyl sulfone [DDS] in water is 38 mgm./100 gm. at 37° and decreases by a factor of two with a 12° decrease in temperature. Equilibrium between human blood cells and plasma with respect to the drug is established within 5 minutes. The amount of the sulfone contained in, or in other ways attached to, the blood cells is four times an estimated free concentration inside the cells. The drug forms complexes with a component in human blood plasma.

2. DDS forms complexes with bovine serum albumin. From a comparative study of these and of the complexes formed in human blood plasma it is inferred that, in human blood plasma, plasma albumin is the active component. The data are compatible with the existence of three identical and independent binding sites ($K_1:K_2:K_3 = 9:3:1$) available to the drug on each albumin molecule. The first complexity constant for the sulfone and human plama albumin at 37° is $2.4 \times 10^3$/mole; for bovine serum albumin at 25°, it is $6.0 \times 10^3$ 1/mole; and at 37°, it is $4.5 \times 10^3$ 1/mole.—[From abstract in *Trop. Dis. Bull.* **59** (1962) 984.]

NATH, R. L. and CHATTERJI, A. Studies on blood lipids in red cell and plasma: Cholesterol and phospholipid in leprosy. Bull. Calcutta Sch. Trop. Med. **10** (1962) 82.

The results of the determination indicated, in 20 lepromatous and 19 tuberculoid cases attending the Calcutta clinic, are shown in a table but not stated. In the lepromatous cases, cholesterol was significantly lowered in both red cells and plasma, but in the tuberculoid cases only in the red cells. Only in the tuberculoid cases was the phospholipid significantly lowered.—H. W. W.

TORSUEVA, N. N. [Protein fractions in the blood serum of patients with leprosy.] Vestn. Dermatol. i Venerol. **36** (1962) 34-37.

The author, addressing herself to the study of the blood serum in 32 patients with different types of leprosy, 6 atherosclerosis patients, and 12 normal people (controls), has found that the serum albumin content in leprosy patients is lower than in those with atherosclerosis. The highest $\alpha$1-globulin fraction content is in lepromatous cases. The $\alpha$2-globulin fraction is especially increased in lepromatous cases, while in those with atherosclerosis it is decreased. The $\beta$-globulin content is increased in lepromatous cases as compared with normal people, but lower in patients with atherosclerosis. The amount of $\gamma$-globulin in leprosy patients is higher than in either normal persons or atherosclerosis patients.—N. TORSUEV

MERLE, F., SUSINI, J. and ORTOLI, A. Le dosage du cuivre dans le sérum des lépreux. [Copper assay in leprous sera.] Bull. Soc. Path. exot. **55** (1962) 209-211.

The authors describe the variations of cupremia in the course of leprosy. There is a very marked increase of copper in the serum. This increase is accompanied by anemic conditions and hepatic insufficiency.—[From authors' summary.]

BHATTACHARYA, B. K. and SEN, A. B. A rapid method for screening compounds in experimental protozoal infections. Arch. Internat. Pharmacodyn. & Therap. **137** (1962) 61-75.

Primarily concerned with drug screening methods for protozoal infections, the authors describe the biological activities of a number of sulfone compounds. One of them, p-ethylamino-p'amino diphenyl sulfone, reported to possess antituberculosis and antileprosy qualities, is shown to have antimalarial properties. The value to leprosy patients in malaria areas of a compound that is active against both malaria and leprosy, is briefly discussed. The authors believe this compound and others they have tested merit more detailed study, since they feel there is still a need for a cheap, dependable, nontoxic sulfone. —J. A. ROBERTSEN

MONTESTRUC, E., PAPA, F. and HERMANTIN, G. Les examens biologiques des états inflammatoires en pratique léprologique, plus particulièrement dans les réactions lépreuses. [Biological examinations of inflammatory conditions in the practice of leprology, particularly in lepra reactions.] Bull. Soc. Path. exot. **55** (1962) 16-19.

This paper describes the biologic techniques which are useful in predicting the appearance of inflammatory conditions in leprosy, and may also be used in following the course of the condition. The simplest and most reliable method is a combination of the erythrocyte sedimentation and the C-reactive protein tests. The authors also found that 3 other techniques correspond with the above in the reactional conditions of leprosy. These are the blood levels of uric acid and fibrinogen, and the Waaler-Rose reaction which shows the blood level of abnormal globulin of high molecular weight. The close correlation of these 5 techniques is shown in tabular form in reacting lepromatous, nonreacting lepromatous, nonreacting tuberculoid, and reacting tuberculoid forms of leprosy.—[From abstract by E. Muir in *Trop. Dis. Bull.* **59** (1962) 982.]

GHOSH, S., SEN GUPTA, P. C. and MUKERJEE, N. Histochemical study of lepromatous leprosy. Bull. Calcutta School. Trop. Med. **10** (1962) 102-105.

This is a report, condensed and without summary, of a study of skin biopsy specimens from 15 untreated, active cases of lepromatous leprosy. Tests made included those for lipids, carbohydrates and enzymes. In the discussion it is stated that empty spaces found in the dermis (after H.E. staining), probably lymph spaces, were more or less filled with acid-fast bacilli, "which were probably multiplying rapidly." Vacuolated (lepra) cells contained neutral fat in proportion to the number of bacilli they contained, and phospholipids and fatty acids were also present. These substances were present in the bacilli but not in the cytoplasm of the host cell apart from the bacilli, which findings do not support the veiw that the invasion of the bacilli causes fatty degeneration or metamorphosis of the cell proteins. PAS-positive material (i.e., neutral mucopolysaccharide) was found in the bacilli, whether they were intra- or extracellular. On staining sections with toluidine blue, large numbers of mast cells were demonstrated.—H. W. W.

REDDY, D. G. and KRISHNAMURTHY, K. R. Changes in peripheral nerves and spinal cord in leprosy. Indian J. Med. Res. **50** (1962) 692-697.

This is a three-part article, dealing briefly with findings in the skin (biopsy specimens), and in the peripheral nerves and spinal cord (autopsy specimens) of both lepromatous and tuberculoid cases. (1) Dermal nerve branches [spoken of as "fibers"] were absent or few in tuberculoid lesions as compared with lepromatous lesions, and those found showed a greater degreee of cellular infiltration but fewer bacilli. [The bacilli shown in a photomicrograph of skin (apart from the tuberculoid infiltrate), and also many of those in nerve lesions, are located in strands of connective tissue, or apparently quite free, rather than within phagocytes.] (2) Peripheral nerve trunks from 3 tuberculoid and 3 lepromatous cases were dissected out for their entire length and sampled at intervals for microscopic examination. In the lepromatous cases the nerves showed gross thickening only at certain points, whereas in the tuberculoid cases they were uniformly thickened throughout. Microscopically, the latter showed the more marked thickening of the perineurium and endoneurium, with diffuse round-cell infiltration together with epithelioid-cell reaction. In one of the tuberculoid cases a few microscopic nerve abscesses were found; in another there were occasional foci in which bacilli were especially numerous, and bacilli could be traced into the brachial plexus and nerve roots. Also in the tuberculoid cases, the degenerative changes of the myelin sheaths and axons were the more marked, and in places they had completely disappeared as did not happen in the lepromatous nerves. In general, bacilli were found in diminishing numbers as the nerves were traced upward toward the spinal cord. (3) In the spinal cords (3 tuberculoid cases) there were very few microscopic changes, and no bacilli were found even after trypsin

digestion of the entire cords. Emphasis is laid on the superiority of Zenker over formalin fixation for the demonstration of the leprosy bacillus, and on the usefulness of Fite's (first, 1938) stain.—H. W. W.

WEISS, P., TAYLOR, A. C. and PILLAI, P. A. The nerve fiber as a system in continuous flow: microcinematographic and electromicroscopic demonstration. Science **136** (1962) 330.

Discovery of the permanent "damming up" of the substance of nerve fibers in front of chronic constrictions, and of the downward advance of the bulge upon deconstriction, has led to the concept that neurons are not static fixtures but streams of substances moving continuously from central production sites in the nucleated cell body into the periphery at rates of the order of 1 millimeter per day, carrying both replacements for major macromolecular components of the axon and "neurosecretions" destined for peripheral discharge. Later data on enzyme and isotope gradients in nerve added circumstantial evidence to this concept, yet the mechanism of convection had remained obscure. Time-lapse motion pictures, under the phase-contrast microscope, of myelinated sensory nerve fibers of young mice and chicks, explanted with their central ganglia into nutrient solution, have now revealed true peristalic waves into the surface of nerve fibers and the actual centrifugal movement thereby produced of the viscous axonal column at the predicted rate. Moreover, electronmicroscopic studies of the "damming" phenomenon in chronically constricted nerves, besides confirming the earlier microscopic findings, have shown that, proximally to a partial block, (*a*) the larger "neurofibrils," which are definitely tubular, become greatly distended to vesicles, and (*b*) mitochondria accumulate in dense piles, in which many then disintegrate. These facts demonstrate (1) that there is a constant movement of fluid distally inside the tubules, and (2) that mitochondria likewise travel distally in the axonal stream. These new findings have brought not only more direct confirmation of the axonal flow but methods for its more detailed study.—[Abstract from *Science* **136** (1962) 330, of paper from the Rockefeller Institute presented at the 1962 annual meeting of the National Academy of Sciences, Washington, D. C.]

BOSQ, J. P and SACHERI, R. F. Localización del bacilo de Hansen en la mucosa nasal intacta y su eliminación al exterior. [Presence of the leprosy bacillus in the intact nasal mucosa and its elimination to the exterior.] Leprología **7** (1962) 63-64.

The authors find that in certain lepromatous cases *M. leprae* is eliminated through the intact nasal mucosa included in macrophages, or are passed by the intercellular spaces mixed with mucus. Then cells and bacillus are eliminated element by element, which explains why intranasal lepromata—at least large ones—are not formed in that location. —E. D. L. JONQUIERES

JAYARAJ, A. P. and CHAUDHURY, D. S. Studies on the structure and functions of the papillary ridges of the digital skin in leprosy. Leprosy Rev. **33** (1962) 41-44.

Biopsy specimens of the distal pad of the fingers of 30 leprosy patients (20 lepromatous and 10 tuberculoid) were studied by cytologic nerve staining methods. It was found that the papillary ridges of the digital skin in lepromatous leprosy are very distinct. In early cases the intermediate ridges descend more in length into the corium than in the advanced disease. Extensive nerve fibers are seen embedded in these papillary ridges. In tuberculoid leprosy, on the other hand, the intermediate papillary ridges do not descend into the corium and the ascending nerve fibers are mostly destroyed, resulting in severe sensory impairment. The papillary ridges in lepromatous leprosy continue to act as an essential part of the tactile sense organ.—[From authors' summary.]

LOWY, L. Processing of biopsies for leprosy bacilli. J. Med. Lab. Technol. **13** (1956) 558-560.

The principal points recommended are as follows: If biopsy specimens are not more

than 3 mm. thick they can be fixed in 3 or 4 hours, and dehydrated in the course of 1 day. The fixative found most satisfactory is 40% formaldehyde 10 cc., mercuric chloride 2 gm., acetic acid 1 cc., water 100 cc. Dehydration in 70% alcohol overnight is followed by 2 hours each in 70%, 90%, 95% alcohol and then in absolute alcohol twice repeated. After dehydration soak in cedar oil overnight, followed by benzene for one-half hour. There should be 3 changes of wax at 56°C. In deparaffinizing, use fresh xylene from a drop bottle, giving 3 changes of 2 minutes each. Rinse in alcohol, wash, remove mercury deposit with iodine followed by thiosulphate, and wash. Add saturated aqueous lithium carbonate solution and wash. After staining with carbol-fuchsin (unheated) for 20 minutes, wash, dry, apply pinene followed by 25% acetic acid, and wash, repeating this sequence as necessary to differentiate as observed under the low-power objective. Counterstain with 0.02% toluidine or methylene blue for 1 minute, wash and dry. Rinse in xylene and mount.—[From abstract by E. Muir in *Trop. Dis. Bull.* **54** (1957) 577.]

Shanklin, D. R. The influence of fixation on the histopathology of hyaline membrane disease. Proc. American Assoc. Path. & Bact., Cincinnati, 1963, p. 41a (abstract).

A reported frequency of 100% pulmonary edema fluid in hyaline membrane disease has been disputed. All the tissues studied for the former report were fixed in Zenker-formol. Finding edema fluid in all of 30 cases in a different hospital in which tissues were also fixed in Zenker-formol, and similar findings in Bouin-fixed experimental hyaline membranes, prompted a study of the effects of different fixatives on the lungs of human newborns. In 27 cases, various formalin fixatives were compared by alternating lung blocks with Zenker-formol; in 4, both were compared with Bouin's fixation. Zenker-formol and Bluin's fluid routinely preserved a loose, floccular network of proteinaceous material interpretable as edema (average 2.1+), while in only 5 of 27 formalin-fixed tissues was edema seen, and then only in trace amounts. A review of illustrations in recent papers showed only 3 with express mention of the type of fixative used; in all it was formalin. None of the photographs showed edema fluid. It is concluded that formalin fixation is not appropriate for the proper study of the lesion in hyaline membrane disease. The difference may lie in the failure of polymerization by formalin of the protein before further processing.—[From abstract.]

Melamed, A. J. Desensibilización experimental de las reacciones leprolínica y lepromínica. [Experimental desensitization of the leprolin and lepromin reactions.] Leprología **7** (1962) 9-17.

An attempt was made to desensitize three tuberculoid patients with repeated daily injections of integral lepromin (Mitsuda-Hayashi), in doses ranging from 0.1 to 1 cc. Tests with "total proteic leprolin" (LPT of Olmos Castro) and with integral lepromin performed after this experience, which in two cases lasted a month and in the third case three months, demonstrated that diminution in the intensity of the Fernandez reaction was in accord with the slower formation of the later nodule, which was smaller in size and had a lesser tendency to ulceration. Nevertheless, these changes had no influence on the histologic structure of the Mitsuda-reaction nodule, which in all cases was follicular or tuberculoid. Thus there was failure to obtain suppression of the sensitization phenomena in leprosy, in contrast with the results obtained by Brownlee in tuberculosis. The author is of the opinion that increase of sensitization to *M. leprae* induced by BCG or other means would not necessarily indicate increase of resistance or immunity against the bacillus.—E. D. L. Jonquieres

Mercau, A. R., Depaoli, E. A. and Culasso, R. H. Hiposensibilización específica, terapéutica y diagnóstica. [Therapeutic and diagnostic specific hyposensitization.] Leprología **7** (1962) 25-26.

In 50 tuberculoid patients with neuritis, therapeutic hyposensitization with bacillary

antigen had an effective action in 70% of the cases, in which acute neuritis was controlled. In contacts suspected of infection because of neuritis without cutaneous lesions, intradermal injection of lepromin or leprolin is suggested as a means of diagnosis. By extension of what occurs in leprosy patients, it is assumed that in those contacts in which neuritis improves with the intradermal reaction a suspicion of infection must be considered.—E. D. L. JONQUIERES

MELAMED, A. J. Comentario sobre las reacciones leprolínica y lepromínica en enfermos hansenianos. [Comments on the leprolin and lepromin reactions in leprosy patients.] Leprología **7** (1962) 18-24.

Biopsies were performed of 48-hour and 21-day reactions obtained in tuberculoid patients with total proteic leprolin (LPT, Olmos Castro) and with integral lepromin (Mitsuda-Hayashi). In the 48-hour reactions, the picture was similar with both antigens, with absence of exocytosis. In the late reactions, exocytosis was observed in both reactions, as well as the typical tuberculoid picture. The late reaction to LPT is explained if there existed in that antigen, even in small amounts, complex bacillary fractions including the lipids. With certain reserves it is assumed that hypersensitivity pictures provoked by either antigen will have characteristics attributed by Waksman to hypersensitivity of the delayed or tuberculoid type. The presence in the reactions of perineural and, possibly, intraneural infiltrations, might suggest the affinity of the antigen with neural tissue, and the intervention of the latter as a shock organ.—E. D. L. JONQUIERES

MCFADZEAN, J. A. The skin reactions of patients with leprosy to the intradermal inoculation of mycobacterial antigens. Trans. Roy. Soc. Trop. Med. & Hyg. **56** (1962) 407-410.

Forty-eight leprosy patients were injected intradermally with lepromin, tuberculin, and antigens prepared from BCG, *M. fortuitum, M. rhodoscrous, M. marinum, M. phlei,* and *M. smegmatis.* There was no correlation between the reactions to lepromin and those to any other antigen. The reactions to tuberculin were significantly correlated with the reactions to *M. marinum,* both at 72 hours, and with the reactions at 21 days to *M. marinum.*—[From author's summary.]

GROTEPASS, F. W. K., DE KOCK, D. H. and KOOIJ, R. Some biochemical aspects of the lepromin reaction pattern evoked by normal liver preparations. Leprosy Rev. **33** (1962) 129-139.

This work was undertaken for the purpose of finding "the active constituent in normal liver which produced the lepromin pattern of reaction," and for reasons connected with the hypothesies of Kooij and Gerritsen that the Mitsuda reaction (to lepromin) is "a kind of foreign body reaction." Details of the technique of making a liver suspension by the Dharmendra method are given. The results are summarized essentially as follows: The results obtained by Kooij and Gerritsen [of skin reactions to normal tissue preparations] were confirmed, but such strong reactions as reported by them were not produced. This deficiency may be due to factors such as age, etc. An attempt to annihilate the tissue particles by ultrasonic waves was unsuccessful, such preparations as well as an absolutely lipid-free suspension, and also the residue after 6N $H_2SO_4$ hydrolysis, still showed the lepromin pattern of reaction. By means of trypsin an inactive preparation was obtained which failed to produce the lepromin pattern of reaction. It is therefore assumed that the particulate state is of importance, if not essential. A lipid substance, sphingomyelin, was isolated from normal liver preparations which was able to produce epithelioid cell reactions but not the typical lepromin pattern of reaction. This finding is not in favor of the view that the Kveim antigen contains an antigen specific for sarcoidosis. It is possible that the particles and the isolated lipid fraction cooperate in producing the lepromin pattern of reaction evoked by normal liver suspensions.—[From authors' summary.]

CHAUSSINAND, R. A propos de la théorie de l'antagonisme entre tuberculose et lèpre. [On the theory of the antagonism between tuberculosis and leprosy.] Sem. Hôp. Paris **37** (1961) 2304-2307.

Regarding the theory of the antagonism between tuberculosis and leprosy, the author wishes to rectify some erroneous interpretations in an article by Chenebault and Rollier. He suggests different clinical and epidemiologic investigations that may likely demonstrate that this antagonism is largely responsible for the progressive eradication of leprosy. The new epidemiologic ideas that these investigations may bring out will make it possible to conduct a more reasonable fight against leprosy infection, especially with respect to prophylaxis and to the order of priority of the campaigns to be undertaken.—[From author's summary.]

TAKAHASHI, Y., MOCHIZUKI, K. and NAGAYAMA, Y. The behavior of three different kinds of antibodies in tuberculosis: antiprotein, antipolysaccharide, and antiphosphatide. II. Human tuberculosis. J. Exper. Med. **144** (1961) 569-579.

In human tuberculosis as in experimental tuberculosis, there exist in the sera of patients three different kinds of antibodies completely distinct from each other. The first two antibodies are produced whenever tuberculous infection takes place or exists, and they persist for a long period even though tuberculous disease be arrested. On the contrary, the production of the antiphosphatide seems to be mainly conditioned by the outbreak of tuberculous disease following infection, because none of the tuberculin-positive healthy persons tested gave a positive phosphatide hemaglutination test. The antiphosphatide hemagglutination test furnishes useful information about the extent or the activity of tuberculous disease. No correlation was noticed between the degree of tuberculin skin hypersensitivity and the amount of any of the three antibodies. The usefulness of the phosphatide hemagglutination test in the diagnosis of tuberculosis is discussed. [The "phosphatide hemagglutination test" may possibly be of use in other mycobacterial diseases. For trial of the test the original article must be examined in detail, especially for the reagents required.]—J. A. ROBERTSEN

TAKAHASHI, Y., ONODERA, T. and YAMAMOTO, K. The behavior of three different kinds of antibodies in tuberculosis: antiprotein, antipolysaccharide, and antiphosphatide. I. Experimental tuberculosis. J. Exper. Med. **144** (1961) 555-568.

The mode and the level of production of the three different kinds of antibodies were found to differ considerably with the mode of infection and the virulence of tubercle bacilli. Evidence is given that production of the antipolysaccharide and antiprotein is stimulated without regard to the mode of infection and the virulence of bacilli, while the antiphosphatide is produced chiefly under conditions where *in vivo* bacilli might have undergone destruction. Of the three antibodies, the level of antiphosphatide was shown to reflect most faithfully the progression of experimental tuberculous infection. The amounts of the three circulating antibodies were found to have no direct relationship to the degree of tuberculin skin hypersensitivity.—J. A. ROBERTSEN

DE ALMEIDA, J. O. Serological studies on leprosy. A comparison of complement-fixation tests using antigens prepared from tubercle bacilli and beef-heart lipids with other serological reactions. Bull. Wld. Hlth. Org. **26** (1962) 233-240.

Sera from patients with lepromatous leprosy were subjected to a battery of serological tests, including flocculation, agglutination and complement fixation. A correlation was found between the content of antileprosy antibody and the reactivity with "cardchol" antigen, but not with *Trypanosoma cruzi* antigen, cardiolipin or the Rubino antigen. The reactivity of leprosy sera with tubercle-bacillus antigen in the quantitative complement-fixation tests decreased in three patients with lepromatous leprosy during sulfone treatment. When syphilis was present in a lepromatous case, it was possible to follow the

effect of specific treatment of the two infections, with sulfone and with penicillin, by drawing two serological curves, one for each of the infections.—[From author's summary.]

KOENIG, M. G., MELLY, M. A. and ROGERS, D. E. Factors relating to the virulence of staphylococci. III. Antibacterial versus antitoxic immunity. J. Exper. Med. **116** (1962) 601-610.

The relative importance of "antibacterial" or "antitoxic" immunity in resistance to staphylococcal disease has been a subject of prolonged debate based on conflicting evidence. Recent studies of the authors have shown that mice immunized intravenously with heat-killed staphylococci are protected against lethal intraperitonal doses of several mouse-virulent strains. The present study was undertaken to further delineate the importance of antibacterial and antitoxic immunity in this experimental system. These studies show that although deaths produced by ordinarily lethal doses of alpha hemolysin can be prevented by immunization with crude alpha hemolysin toxoid, only heat-killed staphylococcal vaccine protects mice against death following infection with viable, replicating staphylococci.—[From authors' introduction.]

DILLER, I. C. Three similar strains of pleomorphic acid-fast organisms insolated from rat and mouse tissues and from human blood. American Rev. Resp. Dis. **86** (1962) 932-935.

During the course of a long-term study of microorganisms in connection with tumor growth, particular attention has been given certain pleomorphic, intermittently acid-fast organisms that were cultured much more frequently from the blood of mice with high tumor rates than from the blood of mice with low tumor rates. One of the three strains especially studied was obtained from the blood of a human patient with lymphatic leukemia. Details are given, but it will suffice here to quote the statement that, in morphology, the "essential features of the life cycle are those described by Alexander-Jackson from malignant tissues [and other acid-fast organisms; see THE JOURNAL **19** (1951) 173-186] and by Brieger and Glauert for *Mycobacterium avium*." These features include variable acid-fastness, the development of motile organelles, and growth in a mycelial phase. Thanks are expressed for aid from, among others, Drs. Elenor Alexander-Jackson and V. Uerthele-Caspe, who have collaborated with the author through the years, and also to Dr. Florence B. Sabin in connection with serologic work reported.—H. W. W.

HART, P. D., REES, R. J. W. and VALENTINE, R. C. The length of *Mycobacterium lepraemurium* recovered from different animal species and tissues after an experimental infection. J. Path. & Bact. **83** (1962) 153-158.

Electron microscope measurements were made of *M. leprae murium* from lesions in the livers of mice, both untreated and treated with suramin (a trypanocidal agent which increases the rate of progression of the infection), and in the livers, testes, subcutis and peritoneum of rats. In the livers of the untreated mice there was elongation in the early months of infection but not later, but very little in the suramin-treated mice; at the end the averages were 1.81 μ and 1.67 μ, respectively. In the rats (not treated with suramin), the bacilli from the livers and the peritoneal lepromata were significantly longer, averaging 2.0 μ or more—over 2.5 μ in 3 of the animals. The results are discussed in relation to host and organ susceptibility and the stage of the infection.—H. W. W.

## NOTE

List of Sustaining Members are not carried in this issue due to lack of space. The list will appear in following issues of this volume.