

CURRENT LITERATURE

It is intended that the current literature of leprosy 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.

NOTICE ABOUT RESTRICTIONS

At the time the material for this issue was prepared there were more abstracts on hand, obtained from one source or another, than could be normally used in three issues. Conditions at present are not normal, because of limitation of funds available for publishing the present volume, and there will be fewer pages than usual in the first three issues; the fourth is to be devoted entirely to the Tokyo Congress material. Consequently, despite our desire to make note of as many as possible of articles on leprosy that are published, and on subjects of collateral interest that come to our attention, more strict criteria for selection will have to be applied than usual. Consequently, to our regret some of the abstracts sent in by Contributing Editors may not be used, and those that are used may be sharply condensed.

VON BEHRING, H. Lepers in Easter Island treatment and conditions of life. *J. American Med. Women's Assoc.* **12** (1957) 75-76.

In 1952, the author was commissioned by the Chilean Navy to reorganize the treatment of leprosy patients in Easter Island. Her experiences are summarized in this short note.
—SR. HILARY ROSS

UTKU, E. Türkiye' de lepra. [Leprosy in Turkey.] *Türk İjiyen ve Tecrübi Biyoloji Dergisi* **17** (1957) 26-32 (French summary).

In Turkey 5 cases of leprosy are detected among every 1,000 recruits. The total number of cases in the country is about 14,000. The major sources are the provinces of the east, northeast and southeast, and minor ones are those of the northern and central regions. But no area is entirely spared. The author deplores compulsory segregation, which is still followed, thus making case finding difficult.

—M. VIETTE

HALLEMA, A. Ordonnantie voor een dorpsleprozerie te Etten in Noord-Brabant. [Ordinances of a local leprosarium at Etten in North Brabant.] *Nederlands Tijds. Geneesk.* **10** (1957) 774-777.

This article refers to a historical document recently found in a private collection, which although undated was probably written in the second half of the 15th century. It deals with the household regulations of a so-called "lazarus-house" in Etten, a small village in North Brabant. The main features are: that admission was on a voluntary basis only; that the management should be on guard against the admission of people who pretended to suffer from leprosy; that the inmates were allowed to go around begging, provided that they should not associate with healthy people; that in case of improvement or cure, examination was compulsory (apparently in order that they might be allowed to leave the settlement). There is no information as to the number of inmates. The author comments on the high prevalence of leprosy in the Netherlands in those days, based on the usual sort of figures on the numbers of leprosy homes (e.g., 19,000 in Europe in the 12th and 13th centuries). According to the author's own historical study of hospital care in the country, there were 78 leprosy homes in the Netherlands at the end of the 16th century. Mention is made of one in Veenhuizen in 1850-1886, and one in Heerde

in 1914. The latter was reopened after the second world war, and now has 50 inmates on a voluntary basis. There are about 200 known cases in the country, all of them imported from the West Indies or Indonesia. A semi-private organization takes care of them.

—P. H. J. LAMPE

CAPURRO, E. La lepra en el libro "Materia Médica Misionera" del Hermano Pedro Montenegro. [Leprosy in the book "Materia Médica Misionera" by Brother Pedro Montenegro.] *Leprológia* 2 (1957) 125-130.

The author comments on the positive immunity the Indoamerican race has against leprosy, according to Brother Pedro Montenegro's book (published in 1710). Leprosy probably existed in the Jesuit missions in northeastern Argentina at the beginning of the 18th century, and the author holds it responsible for the current European infection that had begun 100 years before in that region. However, the incipient enemy was probably of little importance, since Montenegro did not pay much attention to the subject.—[From author's summary, supplied by G. Basombrio.]

MISSION TO LEPERS HONG KONG AUXILIARY. Annual report for 1957, Hong Kong, 1958.

The Hay Ling Chau (Isle of Happy Healing) leprosarium is an unusual institution which has made much progress since it was last noticed in this department five years ago [*THE JOURNAL* 21 (1953) 109]. It is doubtful if any other leprosarium represents the coordinated interests and support of so many entities and active groups, including the Mission to Lepers which initiated it and still contributes, and the government of Hong Kong which makes grants for both maintenance and development. In the matter of installations and activities it has progressed greatly in the past few years, and the members of the WHO Regional Conference for the Western Pacific, which spent a day there last year, were much impressed. Strategically located, it has acquired importance as a demonstration and teaching place, and many foreign visitors go there for longer or shorter periods. Fifth year medical students from Hong Kong, in small groups, spend a week there as part of their medical specialities courses. Whereas in 1952 there were 300 patients, and it was thought that the limit of expansion would be 500, that number had been reached by the end of 1956 and was upped to 596 in 1957—418 lepromatous, 86 tuberculoid, and 92 in two groups called "uncharacteristic" (90) and "indeterminate" (2).

—H. W. W.

MORÁN ORDÓÑEZ, I. Algunos aspectos epidemiológicos de la lepra en el Estado de Guanajuato. [Epidemiologic aspects of leprosy in the state of Guanajuato.] *Bol. Epidemiológico (Mexico)* 20 (1956) 149-154.

The states of Guanajuato, Jalisco, Michoacán and Querétaro together form the largest endemic area of leprosy in Mexico. The municipalities of Guanajuato which have the greatest number of cases are: León, Acámbaro, Salvatierra, Celaya and Irapuato. The northeastern part of the state was found to have the highest prevalence rate: 3.4 cases per 1,000 inhabitants. The disease affects in great proportion the farm laborers of middle age, producing an unfavorable effect on the economy of the state. There was found a slight predominance of male patients over female. As regards classification, of the total of 506 cases studied in the 5-year period 1950-1954, 56.1% (284) were lepromatous, 28.9% (146) tuberculoid and 15% (76) indeterminate.

—M. MALACARA

NELSON, G. S. Leprosy in the West Nile district of Uganda; an epidemiological study with special reference to the distribution of leprosy in Africa. *Trans. Roy. Soc. Trop. Med. & Hyg.* 52 (1958) 176-185.

Following on a report by the interterritorial leprologist of a prevalence of 118 per thousand in the West Nile District of Uganda, the author examined 21,256 persons in 19 villages. The 266 cases found in the villages gave rates varying from 0.6 to 53.3 per 1,000, and it is now believed that there are fewer than 5,000 cases in the district. The largest number in any age group was 56 in the 21-30 period. Classification: 72.6% tuberculoid, 18.4% lepromatous, and 9.0% indeterminate. The district can be divided into two areas, one with less and the other with more than 10 per 1,000. The former is above the escarpment at an altitude of 4,000-6,000 ft., with 50-70 in. rainfall, density of population 118.9 per sq. mile, and a leprosy rate of 6.2 per 1,000. The latter is below the escarpment at an altitude of 2,000-4,000 ft., with 30-50 in. rainfall, density of population 36.6 per sq. mile, and a leprosy rate of 19.4 per 1,000. These figures would suggest that high rainfall and dense population are not causes of high prevalence. Two questions are asked: "Why is leprosy so prevalent in the heart of Africa?" and "Why is the incidence of leprosy in West Nile so much higher below than above 4,000 feet?" The answer to the first question is that the effects of civilization have been felt least in the most primitive major region of the world. The answer to the second is that in the lower region the most scattered population is more primitive and has had the least contact with the influences of civilization; it is possible that here where tuberculosis is uncommon the people are most susceptible to leprosy.—[From abstract in *Trop. Dis. Bull.* **55** (1958) 769.]

Ross, C. M. Leprosy control in the Northern Region of Nigeria. *Leprosy Rev.* **29** (1958) 17-24.

For the control of leprosy in the Northern Region of Nigeria the method adopted is a system of outpatient clinics within reach of all the patients within the region. The population is about 18 million, its density varying from 304 (in Kano) to as little as 25 per square mile (in the Niger Province). Sample surveys have shown a general prevalence of leprosy of about 35 per thousand, with as much as 100 in places. Segregation in leprosia would be too costly, and very few patients would willingly submit to it, but they are willing to attend clinics. To begin with, 10,000 patients were registered at 51 treatment centers conducted by trained leprosy workers and based on existing leprosy settlements, but later it was decided to base treatment on Local Authority and government dispensaries supervised by the Rural Medical Officers. In provinces where, previously, 200-500 cases were treated in settlements and segregation villages, 10,000 to 15,000 are now being treated at a fraction of the cost and with good results. The attendants are not allowed to give more than 4 tablets of DDS weekly. The whole scheme is under the supervision of 2 European medical specialists. Encouraging results are obtained.—[From abstract in *Trop. Dis. Bull.* **55** (1958) 527.]

KITANO, H. Epidemiological studies on leprosy in Gifu Prefecture. III. Vital statistics of leprosy patients. *La Lepro* **27** (1958) 161-170 (in Japanese; English abstract).

This vital statistics of leprosy patients in Gifu prefecture between 1936 and 1955 was studied. Besides the 292 patients reported in a previous paper, 43 patients have been added for a total of 335 (1.2 per 100,000 per year). The rate of incidence is slightly higher than in the previous report but there were no significant alterations epidemiologically. With a total of 253 deaths, the death rate (2.4%) has dropped sharply in recent years and is one-fourth that of the war years. The 9 suicides gave a suicide rate of 3.8%, slightly higher than that of the general population. With a decrease in male deaths since 1945, there is no longer a marked sex difference in this respect; in 1936-1940 the ratio was 3.56:1, and in 1951-1955

it was 1:1.70. The prolongation of life coincides with the increase in life span of the Japanese people in general. An increase in the lepromatous type and in female cases has taken place. A marked rise in leprosy in Koreans is also noted. There were 137 cases being treated at home in 1936, but only 24 in 1955.—[From abstract.]

✓ MERCAU, A. R., VACCARO, A. and FERNANDEZ PODESTA, T. La "denuncia" del enfermo de lepra. [Notification of the leprosy patient.] *Leprológica* **2** (1957) 118-122.

The authors believe there are no figures of real statistical value about leprosy cases in Argentina. They point out that probably the impossibility of keeping the medical secret, due to the kind of cards used up to now, is to be blamed for that failure. They propose a new pattern of cards that may be the solution.—[From authors' summary, supplied by G. Basombrio.]

✓ KHOURY, E. and RINALDI, D. Enfermos de mal de Hansen descubiertos entre familiares y convivientes. [Detection of leprosy cases among household members and contacts.] *Leprológica* **2** (1957) 123-124.

The authors hold that the examination of contacts who present themselves voluntarily who are sometimes reported by the Social Service is not carried out regularly due to administrative causes. Of 2,583 contacts examined, the great majority were Mitsuda positive. Among them 13 cases were detected (7 tuberculoïd, 4 indeterminate and 2 lepromatous), or 0.5% of the total examined. Previous statistics by the same authors gave 2.46%. They comment on the low contagiousness of leprosy and on the decrease of new cases, which is probably due to improvement of hygiene habits of the people. —G. BASOMBRIO

✓ SALOMÃO, A. Lepra e transfusão de sangue. [Leprosy and blood transfusion.] *Arq. mineiros Leprol.* **17** (1957) 114-115.

Prospective donors for blood transfusion should be routinely subjected to the lepromin (Mitsuda) test and to the administration of BCG vaccine by mouth. Candidates should be rejected in the presence of any of the following conditions: (1) Lepromin negativity not changed to positive after BCG. (2) Lepromin positivity with skin lesions suggestive of benign leprosy, verified by histopathologic examination. (3) Existence of leprosy cases in the family of the candidate.—[From abstract in *J. American Med. Assoc.* **166** (1958) 408, supplied by Sr. Hilary Ross.]

✓ STAFFIERI, J. J., FERNANDEZ, J. M. M., CARBONI, E. and TOMMASINO, P. O. Consideraciones sobre el estado endócrino en la enfermedad de Hansen. [Discussion of the endocrine state in leprosy.] *Anales de Cirugía (Rosario)* **20** (1955) 311-315; also *Rev. argentina Endocrinol. y Metabol.* **2** (1956) 149.

The endocrine status of 12 lepromatous cases was studied by clinical examination and hormone determinations: protein-bound iodine in serum, urinary gonadotropins, quantitative urinary smears, urinary pregnamediol, and spermogram. The blood eosinophils, urinary 17-ketosteroids and 17-hydroxycorticoids were studied before and after administration of ACTH. The patients had frequent disturbances in the sexual system such as azoospermia and monophasic cycles, producing infertility. The adrenal function was normal in all the patients.—[From authors' summary, supplied by G. Basombrio.]

✓ DAVEY, T. F. Leprosy and yaws; points of contact. *Bull. World Hlth. Org.* **17** (1957) 485-492.

Leprosy and yaws, which have flourished side by side in the past in Eastern Nigeria, have resemblances in clinical appearance, epidemiology and control. Atypical lesions of the two diseases may occur in the same patient and resemble each other closely, with special reference to the minor recurrent lesions of yaws and the in-

determinate leprosy lesions. Keloid lesions resembling the scars of yaws are often found where caustics have been applied to leprosy lesions. Erythematous framboesides can also resemble incipient lepromatous lesions. Healed gangosa resembles the sunken nose of leprosy. The leucoderma of yaws does not occur in leprosy, but the lepromatous involvement of the fingers resembles the ichthyotic condition of the backs of the hands in yaws. Mild contracture of the 4th and 5th fingers occurs in both diseases, and the condition in yaws may resemble the *main en griffe* of leprosy. Features of differential diagnosis are pointed out. Epidemiologically the two diseases resemble each other most, as both are chronic and spread by contagion. Both are rural and connected with a low standard of living and hygiene. Both decline with the introduction of clothing. In both, children are more susceptible than adults, and in certain places males are more susceptible than females. Conjugal infection is rare, and congenital spread unknown. Both are associated with the tropics and show seasonal variations.—[From abstract in *Trop. Dis. Bull.* **55** (1958) 517.]

✓ KINNEAR BROWN, J. A. and STONE, M. M. Tuberculoid leprosy in identical twins. *Leprosy Rev.* **29** (1958) 53-55.

Young identical twins, the only children who had the disease in a family of 9 siblings, developed single tuberculoid lesions and the back shown in a color photograph to be virtually identical in location and appearance. The contacts were apparently of the tuberculoid type. It is pointed out that the average distance between dwellings in this part of Uganda is about half a mile, and that on the average one open leprosy case can be found in every 5 square miles. The authors argue that the simplest explanation is that the twins derived their infection within the family by contact with an aunt and uncle, both of whom were tuberculoid. This observation is regarded as confirmatory evidence of a constitutional factor [cf. Rothberg's "N Factor"] which is transmitted genetically, and which determines whether successful invasion will take place.—[From abstract in *Trop. Dis. Bull.* **55** (1958) 518.]

✓ ASANO, M. A case of carcinoma of the tongue in a leprosy patient. *La Lepro* **27** (1958) 139-142 (in Japanese; English abstract).

A case of carcinoma of the tongue occurring in a 47-year-old male with lepromatous leprosy is reported. Two small millet-sized nodules were first observed on the edge of the right side of the tongue. These enlarged rapidly and after 3 months had become 2.5 x 2.1 cm. in size, with a cabbage-like appearance. The tumors were removed surgically. The right external carotid was ligated, the regional lymph nodes and submandibular nodes excised, and the right half of the tongue resected. Histologically the tumor was found to be a basal-cell carcinoma. The postoperative course has been uneventful.—[From abstract.]

✓ K'UNG CH'ING-TEH, CHANG T'AN-CH'UAN, HSÜ PU-YUNG, YÜ HUNG-WEN and WU CHO-HUAN. Osteoarticular changes in leprosy. *Chinese J. Radiol.* **5** (1957) 204-210 (in Chinese; English abstract).

Of the 55 cases studied, 32 were lepromatous and 23 tuberculoid; duration varied from 4 to 31 years, averaging 13.7. The bone lesions were classified as specific and nonspecific. The specific lesions were: (1) Cystic changes, usually located in the metaphysis of the phalanges, like a small, round radiolucent area with ill-defined border. The trabeculations in this area were irregular or obliterated. When the lesion became multiple the metaphysis assumed a honeycomb appearance. (2) Expansion of the shaft of the phalanx with decreased density and expansion of the medullary canal and thinning of the cortex were relatively rare in advanced cases. In the nonspecific group were; enlargement of the nutrient foramen, usually located in the distal phalanx; generalized decalcification of the extremities; bone absorption

of the hand and foot; concentric atrophy; fracture; secondary infection, manifested as osteomyelitis; and changes of joints.—[From abstract in *Excerpta Med.* **12** (1958) 265.]

FARINA, R. Total rhinoplasty for deformities following leprosy. *Plast. & Reconstruc. Surg.* **20** (1957) 78-82.

The author describes deformities of the nose resulting from leprosy and discusses the problem involved in repair. By total rhinoplasty is understood the complete restoration of the nose that requires repair of the nasal lining, the columella, the cutaneous covering, and maintenance of the new nasal pyramid with bony or cartilaginous support. He prefers to repair these deformities by the Indian forehead method, flap method, and gives reasons for this choice. —SR. HILARY ROSS

SIMMEL, M. L. Phantoms in patients with leprosy and in elderly digital amputees. *American J. Psychol.* **69** (1956) 529-545.

The problem of the study was whether or not phantoms result as a consequence of absorption of digits in patients with leprosy, a condition which differs in important ways from other conditions known to produce phantoms. The cases studied were 18 amputees at Carville, 14 men and 4 women, most of them between the ages of 50 and 59 years. Each of them had at least one amputation; 13 showed, in addition, total absorption of fingers or toes or both. It was found that phantoms characteristically appear after amputation. They do not result from absorption of digits as long as surgery is not superimposed on the process of absorption. They appear when the remnants of partially absorbed digits are amputated, but apparently not following plastic surgery of the hand long after absorption of fingers is complete. The phantoms which result from amputation of partially absorbed digits do not consist merely of the remnants that were surgically removed; they are phantoms of the whole digits prior to absorption. Upon amputation of a leg, the toes of which had been absorbed prior to amputation, the phantom experienced is complete, including the toes. —SR. HILARY ROSS

KEVERS, G. and NIFFLE, J. M. Iridocyclite hypertensive chez un lépreux. [Hypertensive iridocyclitis in a leprosy patient.] *Bull. Soc. belge Ophthal.* **116** (1957) 322-327.

A 52-year-old man had severe, recurrent nodular iridocyclitis, refractory to local and systemic treatment up to the time when the correct etiologic diagnosis was made. Previously, syphilis and filariasis had been considered, for reasons stated; leprosy manifestations of the lids, superciliary region and hands finally led to the diagnosis of leprosy uveitis. After a severe local reaction to sulfone therapy similar to a Herxheimer reaction, the eye disease improved considerably. There are very few authentic reports on the ocular pathology of leprosy.—[From abstract in *American J. Ophthal.* **45** (1958) 780-781, supplied by Sr. Hilary Ross.]

JONQUIERES, E. and MASANTI, J. G. Insólitas reactivaciones aparentemente ligadas al BCG en enfermos de lepra. [Unusual reactivations apparently related to BCG in leprosy patients.] *Leprológica* **2** (1957) 113-117.

In 33 "arrested" lepromatous cases, 2 were found to have acute lepromatization apparently connected with BCG vaccination; the Mitsuda test remained negative. In another lepromatous case, contrarily, there was a tuberculoid-like reactivation; in this instance the Mitsuda reaction changed from negative to positive. The authors think that the 2 former patients were injured by the reaction, while the third one was benefited. Of the remaining 30 patients, clinically not modified, 4 had a transitory change of the Mitsuda reaction to positive. No conclusion can be drawn regarding the value of BCG vaccination in such cases, although they apparently were not prejudiced.—[From authors' summary, supplied by G. Basombrio.]

D'ANGELO, J. M. Lepra sarcoide. [Sarcoid leprosy.] *Leprológia* **2** (1957) 131-133.

The author comments upon a case of leprotic "sarcoid" with unusual symptoms, which affected the median nerve from the thenar prominence to the superficial cervical plexus, producing pain on movement of the neck or the thumb in forced abduction. Positive histology and tuberculin negativity confirmed the diagnosis—[From author's summary, supplied by G. Basombrio.]

EKAMBARAM, V. Six years aqueous Sulphetrone therapy in a rural area. *Leprosy Rev.* **29** (1958) 102-110.

Treatment comprised intramuscular injections of 3 ml. of a 50% aqueous solution of Sulphetrone twice a week. As the solution is acid it must be neutralized with sodium carbonate. Of 15 lepromatous patients treated, 6 became completely negative clinically and bacteriologically, 3 improved greatly, 1 relapsed owing to irregularity of treatment, and the others were making good progress. The advantages are the low toxicity of the drug, the fairly rapid action, and the absence of complications. The disadvantages, compared with DDS, are the need for injections twice weekly, the time required to produce negative bacteriological results, and the expense. The work was done in Madras State.—[From abstract in *Trop. Dis. Bull.* **55** (1958) 774.]

BARBA RUBIO, M. Tratamiento de la lepra. [Treatment of leprosy.] *Bol. Epidemiológico (Mexico)* **20** (1956) 59-61.

In the Guadalajara Institute of Dermatology the use of other drugs like dihydrostreptomycin, PAS, TB-1, and INH has been abandoned because they have little or no effect on the bacillus; only the parent sulfone is used. From a study on the effect of this drug in lepromatous cases it is concluded: 1. Leprosy is actually curable. 2. This cure is radical. 3. DDS is the most effective, practical and inexpensive drug. 4. The action of sulfones is directly upon the leprosy bacillus, and also upon the reticuloendothelial system, according to the histologic picture presented. 5. Clinical, bacteriologic and histopathologic controls are basic for demonstrating the benefit of the treatment. 6. Sulfoné treatments do not produce major ill effects, or phenomena of serious intolerance. 7. More dermatology centers should be established and expert technicians trained, and private initiative should be encouraged to cooperate in the fight against leprosy. 8. It is necessary, furthermore, to continue the experimental studies on treatments with new compounds, and finally, physically and morally to reintegrate the cured patients to active life.

—M. MALACARA

RANADE, S. S., GOKHALE, B. B. and MOMIN, Q. Epineurectomy in the treatment of trophic ulcers in leprosy. *Leprosy in India* **29** (1957) 48-51 (reprinted).

The authors performed epineurectomy on 31 patients for trophic ulcers of the feet. The operation was done under local novocaine anesthesia, an incision being made behind the head of the fibula and the lateral popliteal nerve being freed from the epineural sheath. In 19 of the 31 patients there was complete healing within an average of 21 days, 3 could not be traced, and in the remaining 9 the ulcers healed to a point but not completely. In one case the ulcer healed and at the same time drop-foot was relieved. Radiologically it was shown that there was recalcification of bone.—[From abstract in *Trop. Dis. Bull.* **55** (1958) 775.]

TARABINI, G. The anti-protozoal action of the sulphones and the anti-malarial action in particular. *Leprosy Rev.* **29** (1958) 111-113.

This is a report of the treatment of 12 cases of *P. falciparum* malaria with Reconan, the dextrose diglucoside of DDS. The dose was 16 gm. during 9 days,

repeated after 10 days' rest. Only 2 of the 12 patients relapsed. Further study in 2 patients showed that this result was due to the DDS contained in the drug. Trials at the leprosarium of Fontilles led to the conclusion that oral sulfones also have an effect in preventing infection with *Entamoeba histolytica*. If these findings are confirmed, the substance may be useful against malaria in leprosy patients, and for prophylaxis.—[Abstract from *Trop. Dis. Bull.* **55** (1958) 731.]

✓ DAVEY, T. F. The treatment of leprosy with diphenyl thiourea compound SU 1906 (DPT). A report on expanded trials in Nigeria. I. A second report on the progress of the pilot trial, with a review of the findings in expanded trials. *Leprosy Rev.* **29** (1958) 25-36.

This is the author's second report on trials with 4 butoxy-4'-dimethylaminodiphenyl thiourea, commonly known as SU 1906 or, for short DPT [THE JOURNAL **24** (1956) 893]. The 16 months since the former report have been used to test its therapeutic activity in larger numbers of lepromatous patients and its usefulness in patients whose response to sulfones is unsatisfactory, and to explore its value in combination with other drugs. Trials were made in 167 patients, 97 of these being at the original center, and 70 others spread over 6 other centers in Nigeria. The drug was administered orally, the daily dose rising from 0.5 to 2 gm. by fortnightly increases for adults, 0.5 to 1.5 gm. for children. The drug is well tolerated even by patients hypersensitive to sulfones and thiosemicarbazone, and promotes a feeling of tranquility and well-being. No instance of sensitivity to DPT had been encountered. Improvement had been at least equal to that with DDS controls, and even a little better. The slowing down of improvement after the first 9 months mentioned in the previous report proved to be only temporary, and, although bacteriologic improvement becomes slower after the initial improvement, clinical improvement continues unimpaired and infiltrations continue to diminish. Erythema nodosum, neuritis and exacerbation are all less frequent than with sulfone treatment. DPT is of particular value in treatment of special cases. Specially mentioned are: 3 patients with hypersensitivity to both sulfones and thiosemicarbazone, in whom entirely satisfactory results were obtained; 3 patients with psychosis had tolerated DPT much better than DDS; 7 patients with persistent ENL under DDS tolerated DPT without difficulty; and patients with severe neuritis under DDS were made more tranquil and gave satisfactory improvement. Twice-weekly treatment seems to have been somewhat less effective on the whole. Combined treatment with DDS and DPT was still without toxicity, and during the first year gave better than DDS alone but further trials are necessary before it can be definitely assessed. A combination of DPT with INH gave differing results at the various centers. In spite of its outstanding advantages, DPT is not as yet suitable for general use, because of its cost and the necessity of frequent administration.—[From abstract in *Trop. Dis. Bull.* **55** (1958) 524.]

✓ MCKENNA, W. B. and CHALMERS, A. C. Agranulocytosis following dapsone therapy. *British Med. J.* **1** (1958) 324-325 (memoranda).

In 1950 Esteves and Brandao drew attention to the beneficial results of dapsone (DDS) in the treatment of dermatitis herpetiformis, and several observers have confirmed their findings. The authors' patient suffering from this disease was given a daily dose of 50 mgm. of dapsone, rising to 100 mgm. daily after a week. After 4 weeks of treatment she developed an "influenza-like illness," and 2 weeks later a diagnosis of agranulocytosis was made, with 1,500 white blood cells per cmm. and no polymorphonuclears or eosinophils. Treated with penicillin and one transfusion of fresh whole blood, the patient had fully recovered by the 18th day. [This case, the abstractor comments, confirms what has been recorded by numerous leprosy workers:

that there is danger in raising the dose of dapsone too rapidly or too high, especially when the patient is suffering from an accompanying depressant disease.]— [From abstract in *Trop. Dis. Bull.* **55** (1958) 526.]

SATANI, Y., NISHIMURA, S., ITO, T., NOJIMA, T., MORIYA, M., TAKAHASHI, T., UEMURA, M., SAKURAI, H., SAIKAWA, K., YOKOTA, T., MIYAZAKI, M., HATA, O., HAYASHI, Y., HIRAKO, M., KAMIKAWA, Y. and WATANABE, Y. Intracutaneous injection of acidomycin in the treatment of leprosy. *La Lepro* **27** (1958) 143-160 (in Japanese; English abstract).

The therapeutic results of intracutaneous injection of acidomycin in leprosy have been reported previously (*La Lepro* **24** (1955) 174-180; also *THE JOURNAL* **23** (1955) 124-130). Treatment with this agent has been continued at various institutions for various lengths of time, 3-6 months at the shortest, 4 years at the longest, and the results are presented here. The total number of cases treated was 129, of which 88 were lepromatous and 41 macular [i.e., tuberculoid], including some neurals. The greatest effect was observed in the macular type, the majority of those responding belonging to this group, while only a few of the lepromatous type showed a response. In long-term treatments there occurred improvement in the sensory disturbance and lessening of the nerve thickening. The mechanism of action of this agent has not been clarified, but from the findings that it has no effect by the intramuscular route whereas intracutaneous injections of streptomycin and INH are ineffective, it is suggested that acidomycin acts specifically on the host tissue rather than as a typical chemotherapeutic directly on the leprosy bacilli.—[From abstract.]

ORSINI, O. Tratamento da lepromatose pela associação sulfono-estreptomicina hidrazida do ácido isonicotínico. [Lepromatous leprosy; combined treatment with sulfone, streptomycin and isonicotinic acid hydrazide.] *Arq. mineiros Leprol.* **17** (1957) 291-294.

According to the literature (it is stated), treatment of leprosy with sulfones alone favors the development or aggravates the lesions of pulmonary tuberculosis. A combined treatment with sulfones, streptomycin, dihydrostreptomycin, and isonicotinic acid hydrazide causes a marked regression of both the pulmonary and the leprotic lesions. It often produces complete recovery from both diseases. A detailed report is given of a woman, 40 years old, who for a year had been treated for tuberculoid leprosy with sulfone tablets by mouth and then complained of symptoms which led to roentgenologic examination of the chest, revealing early lesions of bilateral pulmonary tuberculosis. Under treatment with the four-drug combination both the pulmonary lesions and the lesions of leprosy greatly and immediately improved, along with her general condition.—[From abstract in *J. American Med. Assoc.* **167** (1958) 1179, supplied by Sr. Hilary Ross.]

DE VASCONCELOS, M. J. Ensaio com vitamina B₁₂ no tratamento dos fenómenos dolorosos da lepra. [Treatment of painful symptoms of leprosy with vitamin B₁₂.] *Rev. Med. Cir. e Farm.* (Rio de Janeiro) (1957) No. 256, 356-359.

After discussing the treatment of the most grave symptoms of leprotic neuralgias with aspirin, ephedrine, ethyl alcohol, tartar emetic associated with vitamin B₁, chloropramazine, cortisone, prednisone and hydrocortisone, which sometimes give good but not durable results, the author tells of his use of vitamin B₁₂ in 3 patients. The dose is 500 micrograms daily, with 100 mgm. of vitamin B₁, given for 10 days. Good results were obtained in all of them. The author is optimistic, but cannot arrive at any decisive conclusion from so few cases. Although he is a physician of a leprosarium with 400 patients, the treatment could not be generalized because of the expense.

—H. C. DE SOUZA-ARAÚJO

UTKU, I. E. Memleketimizde lepra şimioterapisi hakkında çalışmalar ve sonuçlar. [Experiences and results of chemotherapy in leprosy in our country.] Türk Ijiyen Ve Tecrübi Biyoloji Dergisi **15** (1955) 287-298.

——— Idem. *Ibid.* **16** (1956) 60-85 (French version, pp. 86-109).

I. (a) The author reports on the effect of INH in 45 rats, some of which were inoculated with murine leprosy, the rest serving as controls. The treated animals were given Rimifon by mouth for 5-6 days. They were not sterilized, but the infection was retarded. The bacilli possibly acquired resistance to INH.

(b) In patients given 5-10 mgm./kgm. of INH daily for 1-3 weeks, the bacilli showed no changes after 1 week, but after 2 weeks they showed morphological evidence of degeneration. After 3 weeks their numbers were reduced and the morphological degeneration was increased. The author thinks that, with sufficient application and duration of treatment, human leprosy can be favorably influenced, INH having bacteriostatic and bactericidal effects. Bad results are caused by insufficient concentration of the medicine in the tissues.

II. (a) From his experience with murine leprosy the author concludes that INH in itself is not able to arrest the development of the infection, but possibly has a retarding effect for some time. It is possible that the Stefansky bacillus acquires a resistance against INH.

(b) For experiments in the treatment of human leprosy only 8 cases were available. The drug was injected locally into the lepromas and the behavior of the bacilli was followed in smears. The drug has an effect on them if in strong enough concentration. The unsatisfactory effect by oral or parenteral application is held to be due to the impossibility of getting a sufficiently high concentration. From laboratory findings in lepromatous leprosy, he concludes that in chronic leprosy the number and formula of the leucocytes gives an indication for prognosis, showing when there is amelioration of the disease. The hemagglutination test of Middlebrook and Dubos showed serologic improvement after sulfone therapy in 102 of 128 cases (80%). There was clinical improvement in 85%. Serologic improvement after INH treatment of 50 cases was 36%, clinical improvement 32%. With combined sulfone-INH treatment of 50 cases the serologic improvement was 82%, clinical improvement 87%. Bacteriologic results after curettage of the nasal mucosa: After the sulfone treatment, 79% were negative after 1 year; after INH treatment, 10% were negative; after combined treatment, 91% were negative. INH has a favorable influence on leprosy, although not as much as sulfones. It influences favorably the general condition, and the psychologic condition of the patients improves. Combined sulfones-INH treatment overcomes resistance of the bacilli against sulfones. Reactions have not been observed during the combined treatment, nor intolerance against the medicine. —R. RICHTER (Ankara).

LAURENT-SAVIARD, M. Sur le dosage colorimétrique des sulfones. [Colorimetric determination of sulfones.] *Ann. Inst. Pasteur* **95** (1958) 98-102 (English summary).

The technique of Georges and Sarton has been used for the assay of blood sulfone and sulfanilamide in experimental animals, in comparison with Marshall's method generally used by the author. The experiments shows that it suffices to use HCl instead of distilled water or saponin as a diluent for blood, to considerably enhance the blood level. Plasma levels are identical with either method, but total blood and red-cell levels are much higher with the Georges and Sarton technique, particularly in the case of sulfones. It is logical to admit that acidification of blood induces a more complete hemolysis of red cells and allows the assay of all the products released.—[From author's summary.]

✓ RIDLEY, D. S. Therapeutic trials in leprosy using serial biopsies. *Leprosy Rev.* **29** (1958) 45-52.

Now that many drugs are being tested for their therapeutic efficacy in leprosy it is important to have an accurate method with a mathematical basis for assessing improvement. Clinical impressions of progress are subjective, and photographs are not amenable to statistical analysis. The various bacteriologic indices have no mathematical basis which can be used for accurate comparison; they reflect the density of the bacilli but not the size of the lesion. The author's method consists in making serial biopsies at 3- or 6-month intervals, 1 or 2 specimens being taken on each occasion. The density of bacilli is estimated according to the number of bacilli in an oil-immersion field, graded from 6+ down to 1+ (1,000 = 6+, 100 = 5+, 10 = 4+, and 1 as 3+; 1 in 10 fields = 2+, and 1 in 100 fields = 1+). A "bacillary" (or "biopsy") index is arrived at by multiplying the above findings by the fraction of the section occupied by the leprous granuloma, this fraction being estimated by observation of a hematoxylineosin section under low magnification, and by considering whether the granuloma occupies much more or much less than one-quarter, one-half, or three-quarters of the dermis. The mean of the rates of progress of 14 cases observed by serial biopsies for at least a year (shown in a table) was approximately 25%. The author sees no necessity for both taking smears and making biopsies. He holds that his method offers the best one available for estimating the activity of antileprosy drugs, and that with its use it should be possible to assess a new drug effectively with fewer patients and over a shorter period. —[From abstract in *Trop. Dis. Bull.* **55** (1958) 525.]

✓ ARAKAWA, I. Cytological studies on leprous tissue. *La Lepro* **27** (1958) 114-125 (in Japanese; English abstract).

Lepromas are characterized by the presence of the so-called foam cells. These cells contain vacuoles which stain yellow with Sudan III and orange-red or orange-yellow with the neutral red supravital method. Similar findings were observed in the cases of macrophage cells of the ascitic fluid of rats and histiocytes surrounding the necrotic nest of tumorous tissue. It is suggested that the formation of foamy cells is a characteristic of histiocytes in general.—[From abstract.]

✓ CHATTERJEE, K. R., RAY, H. N. and MUKHERJEE, N. Histological studies of skin lesions in lepromatous leprosy. *Indian J. Med. Sci.* **11** (1957) 714-716.

It is generally supposed that the lipoid found in the lepra cells of lepromatous leprosy is the product of degeneration of phagocytosed leprosy bacilli and pathognomonic of the lepromatous form of the disease. The authors, studying bacilli of tissue juice of lepromatous lesions, and also histologic specimens, with various cytochemical techniques, could detect no sign of degeneration in the bacilli. The lepra cells, however, were found to be degenerated, and lipoid was the end product of this degeneration. The leprous tissue showed increased activity of the alkaline phosphatase in the nuclei of the cells, nerve fibers, and endothelial lining of blood vessels where the bacilli were present in large numbers. Bacilli are engulfed by fresh macrophages and the latter again degenerate, while the bacilli flourish on the lipids, calcium, polysaccharides and phosphorus supplied by the cell. It is suggested that the presence of calcium may indicate an attempt to limit the spread of bacilli, but in the case of leprosy calcium combines with lipids and is used in the metabolism of the organism to promote its growth and multiplication. Polysaccharides were concentrated most where bacilli were present in large numbers. A similarity in cytochemical reactions (notably metachromasia with toluidin blue) in the macrophage cells and the leprosy bacillus was striking, and suggests a similar type of metabolism in their respective physiologic processes.—[From abstracts.]

CHOREMIS, C., LIACACOS, D., ALLAMANIS, I., ZOUMBOULAKIS, D. and KOURTI, H. Effects of isoniazid on allergy. With some additional observations in children vaccinated with BCG. *American Rev. Tuberc. & Pulmon. Dis.* **74** (1956), Supplement (August), 197-208.

Expressing the conviction that streptomycin fortifies rather than weakens the harmful tuberculin allergy of tuberculosis, the authors report on the suppressive effects of isoniazid on that condition. The experiment was with BCG vaccination of tuberculin-negative children, of which one group (10) was begun on isoniazid 4 days before, one group (14) simultaneously with, and one group (10) 7 days after the vaccination; the control group (13) got no isoniazid. The isoniazid children developed materially smaller BCG reaction lesions than did the untreated controls, the first group smallest; none of them showed late suppuration of the reaction lesions, whereas 82% of those without isoniazid showed suppuration; and practically all of them remained tuberculin (PPD) negative although all of the 13 controls became positive. Discontinuing the isoniazid did not cause the negative tuberculin reactors to become positive, whereas a month's treatment of positive reactors caused 3 of 8 to become negative. Isoniazid apparently has no effect on antibodies (which thus seem to be a separate function of the host from allergy), or on the electrophoretic pattern. Histologically, the lesions after isoniazid were more circumscribed and fibroblastic. A combination of isoniazid and cortisone had a stronger effect, whereas PAS was without effect. —H. W. W.

CHOREMIS, C., LIAKAKOS, D., LEKOU, S., GARGULAS, A. and DROSOS, CH. Effect of isoniazid and cortisone in children vaccinated with BCG. *American Rev. Tuberc. & Pulmon. Dis.* **76** (1957) 263-271.

This report expands on the observations with isoniazid and cortisone together, with emphasis on histologic changes. Three groups of 8 children each were vaccinated; one received isoniazid only (4-6 mgm/kgm), and another isoniazid (same dose) plus cortisone (0.5 mgm/kgm), the third being the untreated controls; treatment began at the time of vaccination. Lesions were excised from 2 children every 2 weeks, the series being finished at 8 weeks. So far as could be observed before biopsies, the effect of treatment was as previously observed. The tuberculin reactions (to PPD, 10 TU) became positive in all the controls, but in the treated groups it became positive—with a single other exceptional case—only in those in whom the treatment had been discontinued when they were biopsied 2 weeks after inoculation. Isoniazid alone inhibits the tuberculoid character of the BCG lesions, resulting in an almost nonspecific inflammation. The isoniazid-cortisone combination results in an entirely nonspecific inflammatory reaction which is less pronounced, more localized, and more rapidly healing. Thus the inhibitory effect of the former is augmented by the latter. —H. W. W.

YANAGISAWA, K., ASAMI, N. and ISHIHARA, S. Studies on the lepromin test. (The seventh report) Comparative evaluation of the potency test of lepromin using tuberculin-sensitized animals and that employing leprosy patients. *La Lepro* **25** (1956) Selected Articles Number, pp. 83-90 (in English); also, *Ibid.* **26** (1957) 261-265 (in Japanese; English abstract p. 261).

Skin tests were conducted with serial dilutions of the same and different lots of the Dharmendra antigen in guinea-pigs sensitized with the tubercle bacillus and in leprosy patients. With serial dilutions from 150% to 66.6%, the animals responded with greater sensitivity and constancy, and a difference in reaction size was noted compared to the leprosy patients. Five lots of the antigen of different manufacture showed potency relations of similar trend. Evaluation of the potency

of the antigen is therefore considered possible by using guinea-pigs sensitized with the tubercle bacillus.—[From abstract.]

✓ FIORILLO, A. M. and BECHELLI, L. M. Lepromino-reação e alterações eletroforéticas em indivíduos não doentes de lepra e portadores de afecções sistêmicas. [The lepromin reaction and electrophoresis changes in persons without leprosy but affected with systemic affections.] *Rev. brasileira Leprol.* **24** (1956) 189-196.

It was found that lepromin reactivity is not correlated with electrophoresis findings, and that the organism maintains the capacity of reacting positively to lepromin despite the presence of affections which involve activity of the defense mechanisms. —H. W. W.

✓ AZULAY, R. D. Our experience with the lepromin test from 1944 to 1955; new experiments with guinea pigs. *Arq. mineiros Leprol.* **16** (1956) 200-211.

This article reviews the author's previous work, including his report in 1953 that subcutaneous inoculation with BCG would render many guinea-pigs reactive to lepromin. The first of the new experiments confirmed that finding: 94% of the BCG animals gave the late reactions, but none of the controls. Repeated (two) inoculations of lepromin did not lead to reactivity. In the summary it is stated that the administration of BCG to cured patients is helpful, as it converts them to lepromin reactors, thus raising the resistance. —H. W. W.

✓ DE CASTRO, I. Análise estatística de alguns dados sôbre o teste lepromínico em comunicantes de lepra, obtidos em Nova Iguassú, pelos doutores Candido Silva e Americo V. Rabelo Neto. [A statistical analysis of data on the lepromin test in leprosy contacts, obtained in Nova Iguassú by Drs. Candido Silva and Americo V. Rabelo Neto.] *Rev. brasileira Leprol.* **25** (1957) 408-411.

This is an analysis of the results in contacts who were initially negative to lepromin a part of whom were selected at random for oral BCG vaccination. The original population of 1,728 individuals, ranging in age up to over 60 years, was 54.2% positive, 18.2% doubtful, and 27.6% negative. As usual, positivity increased with age. Consolidating groups, the positives and doubtfuls together were: of 637 aged 0-9, 61.2%; of 391 aged 10-19, 73.6%; of the 700 older persons, 81.8%. BCG was given to 209 of the negatives, and on second test 84.2% were positive or doubtful (56.5% positive), while of 66 who were not vaccinated the corresponding percentages were 81.9% (69.8%). Because BCG is supposed to be most effective in changing reactivity in young children, an analysis of the results in the 0-4 and 5-9 age groups is given; the difference between the vaccinated and unvaccinated subgroups was not significant statistically. Although the numbers of individuals were relatively small, due principally to the difficulty of obtaining Mitsuda negatives, it is concluded that experimentation with BCG on a large scale would be impracticable. —H. W. W.

✓ SOUZA CAMPOS, N. Indução da reatividade lepromínica por meio de testagen repetida. [Induction of lepromin reactivity by means of repeated testing.] *Rev. brasileira Leprol.* **25** (1957) 167-207 (editorial).

The writer prefaces a symposium occasioned by an editorial by Wade in *THE JOURNAL* [**23** (1955) 310] based primarily on the experience of Ignacio and associates with repeated lepromin tests carried out on young children born in the Culsion leprosarium and removed immediately to the nursery. Of the 50 children tested, at first only 11 were positive, and only 1 of them was 2+. By the fourth test all had become positive, one-third of them 3+, and of the few that could not be brought above 2+ by further testing none could be raised further by the use of BCG. To the symposium no fewer than 24 leprosy workers contributed, giving their own experiences or opinions from various points of view, some of them add-

ing considerable subsidiary data. It is impossible to abstract each of these separately, but in summing up de Souza Campos states that the great majority of those taking part in the symposium admit, with or without reservations, that the lepromin reaction may be converted from negative to positive by inoculation and reinoculation of the Mitsuda antigen. On the other hand, the majority of those who deny this capacity of the Mitsuda antigen are unable to doubt that BCG is a valuable auxiliary in the prophylaxis of leprosy.—[From abstract in *Trop. Dis. Bull.* **55** (1958) 522.]

✓ YANAGISAWA, K. and ASAMI, N. Studies on the lepromin test. (VIII) Sensitization experiments with trypsin isolated bacilli. *La Lepro* **27** (1958) 107-113 (in Japanese; English abstract).

1. Isolation of bacilli. The leproma was homogenized mechanically, pure trypsin added, and the suspension was left for 3 days at 30°C. This was then centrifuged in a "Spinco" for 30 minutes at 10,000 rpm and the sediment was collected and dried. A yield of 180 mgm. of organisms was obtained from 5.2 gm. of leproma. The product was almost completely made up of single organisms with very little tissue fragments.

2. Sensitization experiments. The bacillus suspension and purified tubercle-bacillus wax were used, in 5 groups of guinea-pigs, 5-10 animals each. Group 1 was inoculated with 3 mgm. of the bacilli; Group 2 with 15 mgm. of bacilli; Group 3 with 3 mgm. of bacilli plus 2 mgm. of the wax; Group 4 with 2 mgm. of the wax; and Group 5 was the untreated control. The inoculum was suspended in 0.5 cc. of Freund adjuvant and injected intramuscularly. The cutaneous reaction was tested with the Dharmendra antigen (0.2 mgm./cc.) and tuberculin (1/100 dilution) 3, 6, 9, 12, 18 and 24 weeks after inoculation. It was found (a) that both the Dharmendra and tuberculin reactions became positive in Groups 1 and 2 after 3 weeks, and the former persisted up to 24 weeks and was stronger than the latter. Both reactions, especially the tuberculin reaction, were stronger in Group 3 than in Groups 1 and 2. We previously had made sensitization experiments in guinea-pigs using bacilli collected by the Dharmendra method, but enhancement of allergy was not observed. With the bacilli collected by the trypsin method, however, allergy was intensified. It is suggested that the wax substance of the bacteria is removed by the chloroform treatment in the Dharmendra method.—[From abstract.]

✓ GOMES, J. M. Considerações sobre as lepromino-reações. [Considerations of the lepromin reactions.] *Rev. brasileira Malariol. e Doenças trop.* **8** (1956) 161-169.

The author uses the plural because there are two reactions to lepromin test, early and late, the immunobiologic aspects of both of which are studied. The occurrence of both simultaneously indicates a specific response and suggests a trend for immunity. The absence of the early reaction with late positivity is recognized by most authors as signifying nonspecific resistance. The author does not believe the early reaction to be due exclusively to local factors; most of phenomena come from the nervous system through the internal glands. Early allergic reactions can be produced by conditioned reflexes. The late reaction, which can be induced by the administration of BCG, results from the tissue reactions to the lipoproteins. This type of reaction is not universal, however. Some cases show almost no reaction to the lipoprotein, indicating that the phenomenon is very complex. It suggests more than a local response, but rather that the body reacts as a whole. In lepromatous leprosy, for example, when there is a heavy load of bacillary lipids, the test is always negative. This suggests the existence in the body of a special condition which deeply modifies the cellular biochemistry.—[From author's summary, supplied by H. C. de Souza-Araujo.]

- ✓ OLMOS CASTRO, N., ZAMUDIO, E. and ARCURI, P. Conversión de las reacciones de Mantoux y de Fernandez por lepromina integral. [Conversion of the Mantoux and Fernandez reactions by integral lepromin.] *Leprológia* 2 (1957) 94-95.

The authors applied the lepromin test to a group of 24 supposedly healthy, noncontact individuals from 10 to 18 years old, all of them negative for the Fernandez reaction to the total proteic leprolin (LPT) and also to the Mantoux test made with a 1/1,000 OT. The lepromin test was made with Hayashi-Mitsuda's integral lepromin. Six weeks later all the reactions were repeated with the same antigens. The Mantoux reaction had become positive in 9 cases (37%) and the Fernandez reaction in 19 cases (79%).—[From authors' summary, supplied by G. Basombrio.]

- ✓ OLMOS CASTRO, N. and ARCURI, P. Sensibilización a la lepromina integral inducida por la lepromina integral de diferente época de preparación en personas supuestas sanas no convivientes. [Sensitization to integral lepromin induced by integral lepromin prepared at different times in supposedly healthy non-contacts.] *Leprológia* 2 (1957) 98-103.

A first injection of recently-prepared integral lepromin (3 days old) in supposedly healthy noncontacts gave higher percentage of positive results (61%) than did a 4-year-old lot of lepromin (14%). The difference is attributed largely to nonspecific factors in the recently-prepared lepromin. A second injection of recently-prepared integral lepromin (24 days old) induced a higher percentage (78%) of positive Fernandez reactions than did the 4-year-old lepromin (46%). After two injections of integral lepromin of recent and old preparation, the Fernandez test made with total protein leprolin gave approximately the same positive results (85 and 78% respectively). The percentage rate of sensitization provoked by integral lepromin is independent of the time of its preparation. Integral lepromin is not an adequate antigen for the investigation of sensitivity or for the determination of sensitivity provoked by integral lepromin in supposedly healthy noncontacts because of the differences of its antigenic capacity conditioned by time.—[From authors' summary, supplied by G. Basombrio.]

- ✓ CARBONI, E., CABANILLAS, L. A. and FERNANDEZ PODESTA, T. Ensayo de desensibilización a la tuberculina con lepromina proteica de Olmos Castro. [Attempt at desensitization to tuberculin with Olmos Castro protein leprolin.] *Leprológia* 2 (1957) 104-106.

The authors, having in mind that integral lepromin may cause a Mantoux-negative person to become positive, have tried to determine if the contrary effect, change from Mantoux positive to negative may be achieved by desensitization by means of the proteic leprolin [which they call "lepromin"]. In a group of 12 strongly Mantoux positive patients with pulmonary tuberculosis they injected the leprolin every second day, in increasing doses up to 0.55 cc. Then repeating the tuberculin tests, they found definite reduction of reactivity in 9 cases, and slight in the other 3 cases.—[From authors' summary, supplied by G. Basombrio.]

- ✓ FERNANDEZ, J. M. M., COMPA, F. and CABANILLAS, L. A. Investigaciones realizadas con "leprolina" Stefansky. [Investigations carried out with Stefansky leprolin.] *Leprológia* 2 (1957) 89-93.

The authors made intradermal tests in guinea-pigs, dogs and human with the Hayashi-Mitsuda integral lepromin, Stefansky lepromin [which, unfortunately, they call "leprolin"], tuberculin, and Olmos Castro-Arcuri's proteinic leprolin [which they call "lepromin"]. They read the early and late reactions to the Stefansky's lepromin in this experimental material, which proved to be already in diverse immunologic states. They found that the Stefansky lepromin has a sensitizing influence

with respect to the proteins of *M. leprae* and *M. tuberculosis*. They also observed cross-sensitization phenomena between *M. leprae murium* and *M. tuberculosis*.— [From authors' summary, supplied by G. Basombrio.]

✓ KOSTANT, G. H. and KELCEC, L. C. An effective simplified serologic test for syphilis employing Reiter protein. *A.M.A. Arch Dermat.* **78** (1958) 181-185.

Of the better-known modern serologic tests for syphilis based on the noncultivable Nichols strain of *Treponema pallidum* obtained from rabbits' testicles, which tests give specific results with sera of patients—including those with leprosy—which give biologic false positive results to the more ordinary tests, none is practicable for large-scale use in ordinary laboratories. The T. pallidum immobilization (TPI) test requires living treponemes, while the T. pallidum immune adherence (TPIA) test uses dead treponemes, but because both involve dark-field counting and for other reasons both are unsuitable for general use. The T. pallidum complement fixation (TPCF) test, done with an extract of the same treponemes, has definite advantages but the antigen is expensive. Reiter, by rabbit inoculation, obtained a strain of T. pallidum which proved cultivable, and a thermolabile protein extract of the culture organisms is used in a complement-fixation (RPCF) test. The authors have compared this test with the TPCF and other tests with satisfactory results as regards sensitivity and specificity. The procedure is inexpensive and simple, suitable for mass testing. The sera from a group of 153 patients giving biologic false positive reactions were 100% negative, as they were to the other treponema-based tests used in comparison. [It is not indicated that any of those sera came from leprosy patients, or where the antigen can be obtained.] —H. W. W.

✓ WALLACE, J. H., ELEK, S. D. and HANKS, J. H. Limited multiplication of *Mycobacterium lepraemurium* in cell cultures. *Proc. Soc. Exper. Biol. & Med.* **97** (1958) 101-104.

The limited multiplication claimed for this organism was 2.8 times the original population. The success is attributed to: (1) a high proportion of active bacilli assured by explanting spleen cells from infected mice at a time when the infecting bacilli were in the logarithmic phase of growth, or by infecting *in vitro* Earle's L strain of mouse fibrocytes with an average of 10 bacilli per cell, the bacilli being protected during phagocytosis by serum albumin and yeast supplement; (2) decreasing the inhibitory action of serum by culturing in fluids containing low concentrations of the body fluids. In the spleen explants the number of bacilli was approximately doubled during the first 8 days, and no further increase had occurred after 21 days' incubation. Multiplication in the fibrocytes occurred only when 0.2 mgm. hydrocortisone per cc. was present in the medium, and no further increase had occurred after 14 days' incubation. Infection of fibrocytes was also effected by mixing the cells with spleen cells containing the bacilli; the fibrocytes phagocytosed the spleen cells, but multiplication of the bacilli occurred only when hydrocortisone was present. The doubling of the population during 8 days' incubation is very similar to the maximum rate of multiplication observed *in vivo*.—[From abstract in *Trop. Dis. Bull.* **55** (1958) 660.]

✓ REES, R. J. W. and WONG, P. C. Limited multiplication of *M. lepraemurium* in tissue culture. *Nature* **181** (1958) 359-360 (correspondence).

The number of acid-fast bacilli present in explants of the spleen of mice infected with *M. leprae murium* increases two-fold during cultivation for 15 days in a medium containing 20% horse serum, 5% chick embryo extract, and 75% Hanks' balanced salt solution. No further increase occurred when the incubation time was prolonged to 29 days, and no increase occurred in the presence of 100 µgm. strep-

tomycin and 1 μ gm. isoniazid per cc. This increase in the number of bacilli was shown by making counts with the Breed technique on the cultures after digestion with trypsin, homogenization in a Ten Broeck grinder, and exposure to ultrasonic vibration. The failure of further multiplication to occur during the second 15 days of incubation is assumed to be due to disintegration of the infected cells and consequent exposure of the bacilli to the deleterious effects of the serum in the culture medium; exposure to serum has been shown by Hanks and Gray [THE JOURNAL **22** (1954) 147-161] to inhibit the endogenous respiration of this organism. The generation time of the bacilli in this tissue culture corresponds very closely to the 13 days which is calculated for the organisms *in vivo*.—[From abstract in *Trop. Dis. Bull.* **55** (1958) 661.]

✓ KOONJ, R. Study of the morphology of *Mycobacteria leprae* by electron-microscopy. *Leprosy Rev.* **29** (1958) 56-59.

Bacilli from leprosy lesions which had been excised and ground with saline, and were freed from the tissue cells, proteins and debris by repeated centrifuging. The electron micrographs were taken at x35,000 magnification, some after tungsten oxide shadowing. The author found interpretation of the pictures to be difficult. Bacilli from untreated patients contained irregular arrangements of dense material, and those from patients treated with DDS, isoniazid or thiosemicarbazone were often swollen and transparent. Bacilli from tuberculoid cases did not appear to differ from those from lepromatous cases. One of the published pictures is of a globus, with no limiting membrane visible. The reason for the bacilli remaining in these clusters is discussed, and the author maintains that his findings are consistent with the view that the globus is a colony of bacilli bound together as a zoogloea.—[From abstract in *Trop. Dis. Bull.* **55** (1958) 518.]

✓ HANKS, J. H. Assay of the fate of mycobacteria in cell and tissue cultures. *American Rev. Tuberc. & Pulmon. Dis.* **77** (1958) 789-801.

A quantitative description of the number and fate of mycobacteria in cell or tissue culture is complicated by a number of factors: The focal character of mycobacterial infection, the wide spectrum of bacterial numbers per cell following phagocytosis and the fact that some cells contain innumerable bacilli, the changing ratios and numbers of bacilli per cell are influenced solely by growth or decline of cell populations, the loss of infected cells from populations on glass surfaces and the variable lengths of the mycobacterial units during their growth or destruction within the cell population. Major difficulties have arisen from continual attempts to ascertain bacillary numbers in preparations suitable for observation or cytologic relationships between cells and bacilli; also from failures to cope with the preferential loss of cells which carry, and may be generating, an important portion of the bacillary population. The author illustrates some of the ways in which microscopic determinations may be misleading and describes a method whereby differences in bacillary counts may be measured. This article would require a too lengthy abstract. It is suggested that it be read in the original by all workers in leprosy. There are four tables and one graph. —SR. HILARY ROSS

✓ FORBUS, W. D., CUTTINO, J. T., SMITH, A. C., MARGOLIS, A. MC. and REID, D. W. A comparative study of four groups of acid-fast organisms, with special reference to pathogenicity. *A.M.A. Arch. Path.* **66** (1958) 1-9.

This is a condensed report of an extraordinarily extensive and intensive study of the microbiology and pathogenicity of 208 strains of acid-fast microorganisms, comprising 21 classified as nocardia, 3 as actinomyces, 20 as mycobacteria (including 3 supposed *M. leprae*) and 164 saprophytes from the soil. Subcutaneous in-

oculations of each strain were made into 12 animals—4 mice, 4 rats, and 4 guinea-pigs, all of which were killed after 30 days and examined thoroughly for evidence of local and systemic infections (over 8,000 histologic sections). In total, roughly one-third of the 2,496 animals showed infection, usually only local, but not infrequently with systemic extension. The mouse was the most susceptible animal. The lesions were predominantly granulomatous or mixed granulomatous-suppurative. Unexpectedly, "the pathogenicity of the organisms designed as soil saprophytes... significantly surpassed that of the other groups. This suggests that the soil may be a highly important reservoir of organisms potentially dangerous for man." [Or, it might be said, of organisms contact with which might, in the course of time, affect the immunological status of the individual with respect to reactivity to antigenic elements common to pathogenic mycobacteria, as the tubercle and leprosy bacilli.]
—H. W. W.

ENSELME, J., MARIE-SUZANNE (SR.) and TIGAUD, J. Etude électrophorétique des protéines sériques de rats atteints de lèpres murines. [Electrophoretic study of serum proteins of rats affected with murine leprosy.] *Compt. rend. Soc. Biol.* **151** (1957) 1220-1221.

Serum electrophoresis (Tiselius technique) was performed in 3 groups of rats: (1) inoculated with the Stefansky bacillus, (2) inoculated with *M. marianum*, and (3) controls. The albumin and gamma globulin levels in the normal rats differed little from those inoculated with *M. marianum*, whereas the Stefansky rats showed significant decrease of albumin (27.8% vs 38.7% normal) and increase of gamma globulin (28.9% vs 15.6% normal).
—M. VIETTE

YAMADA, N. Hemagglutination and hemolytic reaction of red cells sensitized with extracts of murine leprosy bacilli. *La Lepro* **27** (1958) 126-135 (in Japanese; English abstract).

Murine leprosy bacilli were extracted of lipid and broken down mechanically; distilled water at pH 7.0 was added and heated. The extract obtained (crude antigen) was double positive, to the Molisch reaction and positive to the ninhydrin reaction. The extract was adsorbed on bovine red cells and used for testing hemagglutination of murine leprosy serum and various other sera. The hemolytic reaction was also tested by the addition of complement. The results were compared to those obtained using OT as the antigen according to the method of Middlebrook and Dubos. The findings appear to verify the belief that a common antigen exists in *M. tuberculosis*, *M. leprae*, and *M. leprae murium* on the basis of the finding that the hemagglutination against OT is specific in these three conditions. The hemolytic reaction occurring on addition of complement to the hemagglutination reaction system using murine leprosy bacillus antigen is more specific and sensitive than hemagglutination in the same manner with OT antigen. The reaction appears to be closely related to leprosy involvement of the internal organs in murine leprosy, coinciding with the report of Kawaguchi. About one-half of the sera of leprosy patients showed prozone in the hemolytic reaction using OT, but it is suggested that this is not due to anticomplement action of the serum but a pattern occurring in the optimal relationship between antigen and antibody. The hemagglutination and hemolytic reactions of tuberculosis serum and murine leprosy antigen are closely interrelated and coincide with the results obtained with OT.—[From abstract.]