

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.

THE FOURTH ALL-INDIA LEPROSY CONFERENCE

Held at Puri, Orissa, January 4-6, 1953.

Summaries of the papers read at this conference, taken from the April issue of *Leprosy in India* 25 (1953) 72-96, were supplied by Dr. Dharmendra. Of necessity, many of them have been considerably reduced.
—EDITOR.

1. Review of Antileprosy Activities

RAO, A. S. A review of the antileprosy organization and work in Hyderabad State. (P. 72.)

[This article had been published previously, and an abstract of it appears elsewhere in this section of this issue.—EDITOR.]

PATTANAYAK, N. B. A brief report of the antileprosy activities of the Orissa State Branch of Hind Kusht Nivaran Sangh. (Pp. 72-73.)

Some of the points of this comprehensive report were: The incidence of leprosy in Orissa is estimated to be 1.2%, with 170,000 cases of which about 20% may be infectious. The highest rates are in the coastal districts of Ganjam (2.4%), Puri (1.5%), and Cuttack (1.4%), ranging down to 0.45% in the Sambalpur district. Surveys have been made of 12,154 villages having a population of 3,658,700, and among the 2,327,800 people examined 30,066 cases have been detected. Among 52,388 students examined from 1,004 schools, 389 cases were found (0.7%). There are 13 isolation institutions with a total accommodation for 908 patients, and 284 leprosy clinics.

LAMPE, P. H. J. Project of leprosy control in Burma. (Pp. 73-74.) [This item is to be found in the News Section of this issue, p. 377.]

AMINOE'DDIN. Some aspects of the leprosy campaign in Central Java. (P. 74.)

The leprosy problem in Central Java and the antileprosy measures in force were described. The population of this province is 14.5 million. There are 1,350 registered cases, 855 men, 336 women and 159 children; 431 (32%) are lepromatous, 852 tuberculoid, and 67 indeterminate. Of these, 300 are isolated in 2 leprosy hospitals, and 149 in the patients' own homes. There are also facilities for propaganda and treatment in 4 outpatient clinics.

DALAL, B. A. and CHAKRAVARTY, B. C. Leprosy work and its relief in the industrial town of Jamshedpur. (Pp. 74-75.)

Jamshedpur, in Bihar, with a population of 213,278 in an area of 24.5 square miles, has a total of 1,068 cases, including beggars (0.5%). Of these,

279 are infectious; 200 are employees; 134 lived in built-up areas, and the rest in *basti* (kutch hut) areas. The largest age group is 25-40 years. In connection with the antileprosy activities, the work of the Jamshedpur Rotary Club was mentioned. The urgent need of a leprosy colony near the town was stressed.

2. Control and Rehabilitation

GOKHALE, B. B. and MULAY, D. N. Thoughts about management of leprosy. (P. 78.)

An outpatient leprosy clinic should be a center for propaganda to attract, trace, and treat the patients, and ultimately rehabilitate the suitable ones; the importance of health visitors is great in this respect. There should be separate dormitories for healthy children of infective patients and for affected children; colonies for able-bodied patients with facilities for different occupations, with an attached hospital for cases suffering from serious complications; and an infirmary for crippled arrested cases. A conference of provincial workers should be held each year.

SINHA, S. N. Rehabilitation of "cured" or "arrested" cases of leprosy. (P. 79.)

The author felt that until a realistic campaign against leprosy was undertaken in earnest, rehabilitation of discharged cases could not be achieved successfully. Such work should be done on a wider, national basis, utilizing existing administrative organizations and maintaining a practical and humanitarian point of view.

MALLICK, P. and ROY, A. T. What next? (A plea for a new colony for the discharged cases.) (P. 79.)

The authors discussed the problems of rehabilitation with respect to age, sex, social status and physical ability. Female patients, both non-infectious and infectious, aged 16 to 25 years, who had come out of institutions with slight mutilation presented the most complex problems. There should be an "After Care Colony" aimed at the solution of these problems. [This paper was published in full in the same issue of *Leprosy in India*, pp. 175-180.]

BAILEY, W. Nowhere to go? (P. 79.)

Discussing the management of healthy children of leprosy patients, the following three ways were considered, in order of priority: (1) at their own native places with relatives; (2) failing that, in a general orphanage, or boarding school; (3) lastly, in the special "healthy home" for such children. [This paper was published in full in the same issue of *Leprosy in India*, pp. 169-174.]

RAI, H. Leprosy and how to eradicate it from India. (P. 79.)

Only a fraction of the leprosy patients in India receive proper care, mainly because the people are not fully conscious of the problem. Leprosy, like tuberculosis, should be dealt with as a Union subject, under direct supervision of the Union government. Each state government should have at least one model leprosy institution, and field work in connection with home treatment of noninfectious cases and education should be carried on in various appropriate ways.

SMITH, K. M. S. Rehabilitation and follow-up of discharged cases of leprosy. (P. 79.)

In her paper Miss Smith stressed two major problems of a patient in a colony: prevention of the widening of the gap between him and his relatives, and the preparation of them and fellow-villagers for his return to their midst. She advised frequent visits by the patient to his home, establishment of smaller village colonies, and an education campaign in schools and villages.

BOSE, B. N. The idea of antileprosy work by own area protection. (Pp. 79-80.)

The author advocated home isolation of infective patients, with monetary help where necessary. Alternatively, they could be isolated in a local segregation camp. In either case, their movement should be restricted. There should be a clinic in each area with about 1,000 patients, its function both curative and preventive. The scheme would require cooperation between the people, local bodies and state government.

3. Treatment of Leprosy

KANAKRAJ, J. D. Webster's operation for gynecomastia as performed on leprosy patients. (Pp. 83-84.)

The author reported good cosmetic results of surgical removal of enlarged breasts in Madras. He had followed mainly Webster's technique, with certain modifications which he described. [This paper was published in full in the same issue of *Leprosy in India*, pp. 117-122.]

DHARMENDRA. ACTH and cortisone in the treatment of acute complications of leprosy. (Pp. 84-86.)

[This article was published in full in the same issue of *Leprosy in India*, pp. 123-140. It was also reprinted in the last issue of *THE JOURNAL*, pp. 201-217.]

BISWAS, H. G. Chemotherapy of leprosy. (P. 86.)

The author traced briefly the successive stages of development of chemotherapy of leprosy, starting with the work on chaulmoogra oil, to the present-day sulfones. Study of numerous nitrogen-substituted compounds of DDS has shown that their therapeutic effect is proportional to the amount of DDS liberated in the system. The presence of one acetyl group decreased the *in vivo* activity, while the butyryl derivative was highly active. This probably reflected greater speed of hydrolysis of the butyryl group, clearly indicating that the two free amino groups of the parent compound are essential for high activity. Regarding other substituted sulfones, the antibacterial activity of DDS is diminished when the position of the amino group is shifted from 4 to 3. Of analogues of DDS, prepared by replacing one of the phenyl groups by heterocyclic nuclei, only those having at least one benzene nucleus with nitrogen in the para position are active. Replacing a phenyl group with a pyridyl, thiazolyl or quinoline group decreased activity. 4:4'-diamino-2-hydroxy sulfone was as active as DDS, while the activity of 4-amino-2':4'-dihydroxydiphenylsulfone was somewhat less. The nuclear-substituted DDS, 4:4'-diamino-2:2'-dihydroxydiphenylsulfone, was found to inhibit the growth of *M. tuberculosis* in a very high dilution (1:256,000) and to prevent the death within 3 weeks of any mice

experimentally infected (I.V.) with *M. murium*. Tests on mice showed this compound to be nontoxic at doses of 500 mgm./kgm. [This paper was published in full in the same issue of *Leprosy in India*, pp. 141-147.]

PAUL, H. Recent advances in the treatment of leprosy. (Pp. 86-87.)

In the author's experience with sulfone treatment in the Lady Willingdon sanatorium, marked clinical and bacteriological improvement occur in moderate and advanced lepromatous cases whereas in the earlier cases progress is very slow. Whatever the type of sulfone used and whatever the dosage, the chief factor is prolonged treatment (3-4 years). The various sulfones had produced almost the same negative rates in almost the same periods of time. For outpatient treatment, DDS in a single dose of 600 mgm. once a week had been found most satisfactory. Physiotherapy and orthopedic measures are also important.

ROY, A. T. Diaminodiphenylsulphone in leprosy (with special reference to its method of use and depot formation). (P. 87.)

Comparing one group of 83 lepromatous cases treated with 50 to 300 mgm. of DDS orally each day for an average period of 29 months, and another group of 132 cases given 200 mgm. twice weekly by subcutaneous injection (1 cc. of 20% suspension in coconut oil) for a period of 24 months, a little better results were seen in the latter group. Chemically pure, neutral and deodorized coconut oil was found to be the best, but expensive. The causes of depot formation [i.e., nonabsorption] were discussed. [This is a continuation report of one published in *Leprosy in India* 24 (1952) 130-132, in which it was stated that, except for the trouble of giving injections, parenteral DDS was very advantageous.]

BOSE, D. N. A study of the efficacy of sulphones and combined treatment with sulphone and hydnocarpus oil in lepromatous and tuberculoid cases of leprosy. (P. 87.)

The author reported the one-year results of three treatment methods: (1) 23 lepromatous cases, given parenteral sulphetrone, 50% aqueous solution, average dose 4 gm. per week; (2) 17 lepromatous and 4 tuberculoid cases given DDS orally, 500 mgm. per week; (3) 20 lepromatous and 13 tuberculoid cases, treated similarly with DDS together with 1-2 cc. of hydnocarpus oil intradermally, subcutaneously under patches and infiltrations, and along thickened nerves. The last method produced the most clinical and bacteriological improvement, and the author believes that hydnocarpus therapy should not be discarded altogether. [This paper was published in full in the same issue of *Leprosy in India*, pp. 148-150.]

GOKHALE, B. B. and RANADE, S. N. Treatment of leprosy with sulphetrone injections in the outpatient department (with particular reference to small doses). (P. 87.)

The authors reported on results of intramuscular administration of aqueous sulphetrone solutions of different strengths in the outpatient department of the Sassoon Hospital, Poona, for periods varying from 16 to 104 weeks. Group 1: 6 lepromatous cases, 50% solution, 5 gm. per week. Group 2: 7 lepromatous cases, 25% solution, 2.5 gm. per week. Group 3: 21 lepromatous and 11 bacteriologically negative neuromacular cases, 3.3% solution, 0.33 gm. per week. Most of the cases showed clinical and bacteriological improvement, the results in all of the groups being of much the same

order despite the different concentrations of the drug in the blood and skin. The average concentrations in blood after 24 hours were 3.6, 2.0 and 0.6 mgm.% in the 50%, 25% and 3.3% groups, respectively. The corresponding concentrations in skin were 2.1 mgm., 1.1 mgm., and nil.

KHOSHOO, P. N. Observations on the modern treatment and management of cases of leprosy in an asylum. (Pp. 87-88.)

The author, in the Cuttack Leprosy Asylum, Orissa, treated 134 cases with DDS orally, 100 mgm. per day 6 days in a week, following 3 months of treatment with a 15-day rest period. Most of the cases were lepromatous, some tuberculoid. The clinical results were of the usual kind. Fragmentation of bacilli was noted after 6 months, and they were reduced to granules after 12 months. Vitamin B₁₂ proved very beneficial in 11 cases with lepra reaction which did not respond to routine treatment.

RAO, A. V. Recent advances in the treatment of leprosy, and the work carried out in Vadathorasalore Leprosy Home, Madras State. (P. 88.)

The author has found diasone, sulphetrone and DDS all to be of value in all types of leprosy. Sulphetrone, 50% aqueous solution, was used in three different dosages—3.5 cc., 2 cc. and 1 cc. twice weekly—in three groups of 25 lepromatous cases. The results with the 1 cc. dosage were "not satisfactory," and there was by much the least tendency to reactions.

4. BCG and Prophylaxis of Leprosy

DHARMENDRA, MAZUMDER, S. and MUKHERJEE, N. The possible role of BCG vaccination in prophylaxis against leprosy. (Pp. 93-94.)

This report concerns lepromin conversion by intradermal BCG vaccination (0.05 mgm.) in a group of 150 lepromin- and tuberculin-negative individuals, consisting of 11 neural cases, 18 lepromatous cases, 9 healthy contacts and 112 healthy noncontacts. The test antigens were Dharmendra's refined lepromin and PPD tuberculin. On retesting 3 months after BCG, 131 (87%) were found to have become tuberculin positive, but only 49 (33%) lepromin positive. There were 10 of the 11 neural cases, but only 1 of the 18 lepromatous ones; also 4 of the 9 contacts, and 34 of the 112 noncontacts. The frequency of conversion was lower than has been reported by others, a difference believed to be due to one or more of the following factors: the higher age of the persons investigated, the route and dose of BCG, and the use of the refined lepromin. It was pointed out that the use of BCG vaccination in leprosy prophylaxis is based on the assumption that induced positivity has the same significance as naturally-occurring positivity, which may be so but definite supporting evidence is as yet lacking. "This prophylactic measure, if found effective, together with the recent advances in the field of treatment of leprosy, will bring in sight the solution of the vexed leprosy problem." [This paper was published in full in the same issue of *Leprosy in India*, pp. 163-168.]

5. Bacteriological Index

ROY, A. T. Bacteriological index in leprosy work. (P. 95.)

After mentioning the methods of Cochrane, Muir, Molesworth and Erickson of arriving at a bacteriological index, the author advocated taking 5 smears from parts selected to show the largest number of bacilli and

grading each smear from 1 to 6 according to the degree of positivity. The highest number of total points would be 30.

8 CHATTERJEE, K. R. Bacteriological changes and their assessment in cases of leprosy under chemotherapy. (Pp. 95-96.)

The author made a comparative study of the following four methods: (1) 6 smears and 4 degrees of positivity (Dharmendra), (2) 16 smears and 6 degrees of positivity (Cochrane), (3) 16 smears and 4 degrees of positivity, and (4) 6 smears and 6 degrees of positivity. A total of 51,200 smears were taken from 250 cases over periods of from 6 months to 2½ years. In L1 and L3 cases the initial result with all of the four methods were mostly in agreement, but in L2 cases the 4-degrees method (both with 6 and 16 smears) provided the most balanced results. Correlating the frequency polygons of the extent of the disease with those of the initial bacteriological result, it was found that of all the curves the 6-smears 4-degrees one was the most balanced and of the same type as that of the extent of the disease in the cases. Working out averages of all the readings falling within the ranges of the degrees adopted, and plotting curves with those values, it was observed that they all had shown that the trend of the curves was similar with all of the four methods, indicating that the trend of bacteriological progress had been shown with the same degree of efficacy. After considering other points it was concluded that Dharmendra's 6-smears 4-degrees method was the most simple and least time-consuming, and gave the most balanced, uniform and reliable results. [This paper was published in full in the same issue of *Leprosy in India*, pp. 151-162.]

6 LEITE, A. SALAZAR, DE LUZ, J. V. BASTOS and NOGUEIRA, E. J. PINTO. Relatório de Missão de Combate a Lepra na Província Ultramarina de Guiné. [Report of the Mission for the Fight Against Leprosy in the overseas province of (Portuguese) Guinea.] (Typewritten, with printed cover, including 19 photographic prints and printed map and tabular matter.)

This report (subheaded Fifth Course, Institute of Tropical Medicine, 1951-52) is of the findings of the authors' mission which, during about 70 normal working days, covered all of the continental zone of Portuguese Guinea. This area totals 36,125 sq. km., and for density of population ranks sixth in the African inter-tropical zone, situated in the Northern Hemisphere. In the two phases of the investigation the group travelled 4,901 and 1,028 km. and visited 79 localities, where there were always large concentrations of people, sometimes more than 3,000. The first phase comprised an "extensive" census, which included about 20% of the total native population, a number of appreciable statistical significance. The second phase was devoted to the study of local conditions for the installation of future leprosy hospitals, and evaluation of experiments in outpatient treatment with DDS by mouth by the dosage scheme of Lowe. For lack of time the classic epidemiological data recommended by the Havana Congress were not gathered, nor could lepromin tests be made, but it was possible to obtain 292 bacteriological smears, either of the nasal mucosa (scrapings) or of the skin (Wade's scraped incision method), and also 94 biopsy specimens. The report includes maps and tables showing (a) a general summary; (b) the total number of individuals observed in

each of the concentrations, according to tribe and sex and age groups; (c) the cases of leprosy found, with data on sex and age; (d) the distribution of cases by tribe; and (e) the clinical types of the disease, also by tribes.

The only existing village for the isolation of patients was visited. As a starting point, its immediate enlargement is recommended (as well as improvement of the sanitary conditions), so that it may house 1,500-2,000 patients. These would be only contagious and repulsive patients; the others—which would be up to approximately 90%—would be treated locally through an outpatient system carried on by specialized male nurses under periodical medical control. In the final part of the report there is suggested the basis of a plan for the urgent installation of a permanent anti-leprosy service.

The results of the inquiry are summarized as follows: (1) A very small percentage of the cases were of the lepromatous type—only 2.4%, certainly subject to correction on future intensive inquiry, which should also include the contacts. (2) The facilities now in existence for control of the disease are inadequate, consisting of only a small village, of recent construction but of small capacity, where 65 patients can be housed under imperfect conditions of segregation. (3) Certain tribes, particularly the Fula and the Mandinga, still have recourse to ineffective native methods of treatment, such as cauterization of lesions by physical means or with the sap of certain plants. (4) No tribe is exempt from leprosy, although in some of them, such as the Balanta, the Felupes and the Baiotes, its frequency is not as high as in the islamized ones, the Fula and the Mandinga, amongst whom it attains respectively 35 and 40 per thousand; and there, moreover, are found the greatest numbers of lepromatous cases. (5) No tribe, in present days, carries out strict segregation of leprosy patients, although the natives have a more or less exact knowledge of the disease, and consequently many children can be seen in domestic contact with infected persons. (6) An important factor of diffusion consists in the promiscuity and agglomeration in dwellings of small size and poor ventilation and lighting, apart from the factors of the worst sort of sanitary condition in the community. (7) The standards of nourishment are very variable, and in certain instances definite deficiencies can be seen, but no cases of appreciable undernourishment which might have any direct relationship with the disease were met with. (8) The high average humidity and the low altitudes throughout the territory may constitute important etiological factors favoring the evolution of leprosy. (9) Finally, it is believed that, in the absence of an efficient and immediate fight against it, the frequency of leprosy in this African zone will progressively increase, on a par with the increasing facilities of communications at the disposal of the native population, together with the high grade of promiscuity which also contributes to the existence, at a pronounced level, of many other infectious and parasitic maladies in some tribes, including for example yaws and the helminthiasis.

—A. SALAZAR LEITE

GRUSHKA, T. [Leprosy in Israel.] *J. American Med. Assoc.* **151** (1953) 843 (Foreign Letters).

This information derives from a survey of the health services of Israel published under the editorship of Prof. Theodore Grushka. There have always been a number of endemic foci in the country, particularly in

the old towns and settlements, such as Tiberias, Safed, and the old city of Jerusalem, where Jews and Arabs formerly lived in close contact. The prevalence among these two elements was the same, with 1 Jew to 2 Arabs affected, which is their ratio in the population. Since the end of the mandate the number of cases in the indigenous population has not increased, but new cases have come in with the great immigration from neighboring countries, particularly from Turkey, Yemen, Iraq, and Kurdistan. At present there are about 80 known cases among the Jews, and probably a similar number undetected. A leprosarium run by the Moravian Sisterhood has existed in Jerusalem for more than 70 years. Previously, it housed about 25 patients. More than one-half of them were Arabs, most of whom were transferred to Transjordan in 1949 at their own request. By June 1952, the number of patients had increased to 60. In April 1951, the Israeli Ministry of Health bought the hospital from the sisterhood, and is now responsible for its upkeep. The skin department of the Hadassah University Hospital in Jerusalem took on responsibility for the medical treatment, and the hospital is now a teaching hospital of the Hebrew University Medical School, with all specialized departments of the school at its disposal. All patients undergo clinical, bacteriological, histological, and immunologic tests and are photographed. Modern drugs are being used with some success, and some of the patients have been discharged to remain under outpatient supervision. There is no law of compulsory isolation, and all who are hospitalized are there of their own free will. This has the advantage that those detected early are not afraid to enter the hospital, for they know that they need stay only as long as they wish. Contacts are investigated. A dermatologist examines every new immigrant in the reception camp, and every suspected person undergoes special examination. If leprosy is confirmed, all members of the family and contacts are examined clinically and bacteriologically and the examinations are repeated every half year. It is thus possible to detect contacts with positive bacteriological findings but without clinical signs of the disease, and to treat them before irreversible complications occur. It is hoped in the future to transform the hospital into an agricultural community with a hospital department for observation of acutely ill patients.

—F. A. JOHANSEN

QUAGLIATO, R. Algumas considerações epidemiológicas em relação ao censo de 1940 e os casos registrados no D.P.L. do estado de São Paulo. [Some epidemiological considerations in relation to the 1940 census and the cases registered in the leprosy department of the state of São Paulo.] *Rev. brasileira Leprol.* **19** (1951) 139-160.

It was originally believed that in São Paulo leprosy was most common in Italian immigrants and their children, and that possibly these were particularly susceptible. In this statistical study the total population of 7,180,316 is first analyzed and then the leprosy patients are divided according to nationality, color, sex, profession and age at onset of the disease. Brazilians form 88.1% of the population, and about 80% of the patients. Italians formed 8.7% of the population in 1920, and only 3.2% in 1940, while in the latter year they contributed 10% of the leprosy cases. Classified by color, 84% of the population were white, but 91% of the leprosy patients were white. It is questioned whether this is due to racial susceptibility or to greater facility for diagnosis. This article is well

worth studying, but is difficult to abstract.—[From abstract in *Trop. Dis. Bull.* 49 (1952) 406, supplied by L. de Souza Lima.]

- BROWN, C. P. Leprosy in Canada. *Canadian J. Publ. Hlth.* 43 (1952) 252-258.

The records since 1815 show 369 cases of leprosy, although there were others treated in hospital. Those of the Tracadie hospital in New Brunswick show 318 cases, 283 described as of French origin; 290 originated in that province, 4 in Nova Scotia, and about the same numbers in Prince Edward Island, Quebec, Ontario, Manitoba and Saskatchewan; also 1 in Bermuda. In the Bentinck Island hospital, near Victoria, British Columbia, there have been 51 cases since 1892. Attention was first drawn to leprosy in British Columbia in 1882 by an attempt of some Chinese to burn one of their countrymen who had the disease, and a physician from Tracadie confirmed the diagnosis in 5 cases. Introduction of the disease into New Brunswick was most likely by the original settlers from Normandy, which was a leprous district. Details are given of the shift here, in 1862, from forcible to voluntary segregation and the measures taken. In 1906 leprosy came under the control of the Dominion government. The law provides for compulsory treatment in government hospitals, but it is also permissive in effect. It is noted that the disease has never appeared among the native Indian population, nor among the native-born Orientals who have lived continuously in Canada.—[From abstract in *Trop. Dis. Bull.* 49 (1952) 1047.]

- ORSINI, O. Situação atual da endemia leprótica em Minas Gerais. [The present situation of leprosy in Minas Gerais.] *Arq. mineiros Leprol.* 11 (1951) 94-101.

This paper, the inaugural lecture at a course of leprology given in Belo Horizonte, reviews the history of the evolution of the enemy in Minas Gerais and of the antileprosy measures adopted. Reference is made to the 6 leprosaria, 10 dispensaries (3 of them ambulatory), and 6 preventoria provided for combating a disease represented by 15,000 cases. Since 63.8% of them are lepromatous, at least 9,570 patients should be isolated, which would necessitate increasing the capacity of the asylums which now contain 5,000 beds. In spite of the great forward step represented by sulfone treatment, there is urgent need of expanding the leprosy service—although it is well organized—in view of the gravity of the sanitary problem. —O. DINIZ

- DE BLAQUIER, H. C. Patronato de Leprosos de la República Argentina. Su acción social. [The Patronato de Leprosos in Argentina; its social activities.] *Rev. argentina Leprol.* 1 (1953) 7-9.

This is a report of the work accomplished during the 23 years of existence of this organization. The work of the preventorium "Mi Esperanza" is mentioned especially. This short article is illustrated by numerous photographs. —G. BASOMBRIO

- KHOURY, E. Enfermos de Hansen descubiertos entre enfermos y familiares. [Leprosy cases detected among patients and household members.] *Rev. argentina Leprol.* 1 (1953) 13.

As a result of precautionary examinations, new cases have been detected as follows: in 1948, 7 new cases detected among 515 contacts exam-

ined, or 1.3%; in 1949, 11 new cases among 323 contacts, or 3.4%; and in 1950, 6 new cases among 222 contacts, or 2.7%. —G. BASOMBRIO

LAMPE, P. H. J. Disminución, baja incidencia y desaparición de la lepra en el Archipiélago del Caribe y América Central. (Informe preliminar.) [Decline, low incidence and disappearance of leprosy in the Caribbean Archipelago and Central America.] Bol. Of. San. Panamericana **32** (1952) 412-415.

The literature and statistics available show a tendency to diminution and disappearance of leprosy in Central America and the Caribbean Area, and it is urged that a special study be made of the factors underlying this diminution, with the use of uniform methods of procedure similar to those used in Texas and Bolivia. The urgency of not losing this opportunity is stressed.—[Abstract from *Trop. Dis. Bull.* **49** (1952) 964.]

RAO, A. S. A review of antileprosy organizations and work in Hyderabad State. *Leprosy in India* **24** (1952) 178-182.

Hyderabad state, in the Deccan, covers an area of 82.7 square miles with a population of 18.6 millions. The gross incidence of leprosy as revealed by surveys is 5 per thousand, varying from 1 to 12 per thousand in the different areas surveyed. There are six leprosy institutions with a total accommodation for 670 patients, the largest being at Dichpali with 400 patients. There are also 126 outpatient clinics attached to different hospitals and dispensaries. —DHARMENDRA

RISI, J. B. Da assistência dispensarial e o armamento antileprotico no Brasil. [The dispensary services in the antileprosy campaign in Brazil.] *Rev. brasileira Leprol.* **19** (1951) 61-69.

This is a very frank and thorough discussion of the leprosy problem in Brazil and of the meagre success which has attended the efforts made in the last 10 years to meet it. In the 25 federated states of Brazil, besides the 36 leprosaria, there are 85 dispensaries for the control and treatment of leprosy: 22 in São Paulo, 9 in Espirito Santo, 7 in Minas Gerais, 8 in the Federal District, and 5 in Rio de Janeiro. The distribution of these dispensaries does not correspond with the distribution of leprosy, as there are only 8 in the north where the prevalence rate is 3.75 per thousand, while there are 32 in the east where the rate is 1.09 per thousand. In 1946, when the total number of known patients was 61,191, there were 20,000 contacts examined. During the five year period since then the average yearly number of cases found among the contacts examined was 1.5%. During the last 10 years, 11,000 new patients have been discovered. During that period the average annual increase of the population in Brazil was 1,140,000. Of the whole population it is calculated that at least 1 per 1,000 has leprosy. The two chief reasons given for the lack of success in controlling the disease are: the scarcity of dispensaries, many of which are little more than registering stations, and the difficulty in obtaining efficient personnel, in part because the pay is insufficient to attract persons suited to this type of work.—[From abstract in *Trop. Dis. Bull.* **49** (1952) 405, supplied by L. de Souza Lima.]

DRICOT, C. La thérapeutique moderne de la lèpre appliquée a un essai d'éradication de cette affection dans une région du Congo Belge. [Modern treatment of leprosy applied in an attempt to eradicate the

disease from a region of the Belgian Congo.] *Bruxelles-Méd.* **32** (1952) 452-456.

The introduction of DDS has made it possible to reorganize the campaign, and the plan for that is given. Only the lepromatous cases, which are less than 10% of the whole, will be treated in leprosaria, while the tuberculoid and other noninfectious cases will be treated at home, thus permitting closer attention to the former. They will be given DDS by mouth, while the others will be given it once a week or once in two weeks by injections of a suspension in oil or esters. Other features of the proposed campaign are considered.—[From abstract in *Trop. Dis. Bull.* **49** (1952) 632.]

OLMOS CASTRO, R. La calmetización en la profilaxis antileprosa. [BCG vaccination in the prophylaxis of leprosy.] *Rev. argentina Leprol.* **1** (1953) 2-4.

Considering the difficulties of segregating all bacteriologically positive patients, and the lack of a medicament as sterilizing as penicillin in syphilis, which would be the ideal in the fight against leprosy, mass immunization of the healthy inhabitants stands as the means of prophylaxis.

—G. BASOMBRIO

[EDITORIAL] Are "closed" cases of leprosy infective? *Lep. India* **23** (1951) 147-153.

In this note certain findings of Figueredo and Desai of Bombay bearing on the infectivity of "closed" neural cases are examined critically. These workers have reported that the frequency of secondary cases in home contacts was the same whether the primary cases were neural or lepromatous. Moreover, they reported the finding of acid-fast bacilli (considered by them to be *M. leprae*) in the normal skin of 42% of healthy contacts of lepromatous cases, and in 40% of contacts of neural cases. The evidence produced is regarded as not convincing, but the findings reported should stimulate further work on the subject.

—DHARMENDRA

PEREIRA, A. C. and SALOMÃO, A. Situação da criança leprosa de forma não lepromatosa nos preventórios. [Situation of the nonlepromatous leprosy child in the preventorium.] *Arq. mineiros Leprol.* **10** (1950) 33-39.

The authors refer with approval to the conclusions of the Havana congress that bacteriologically negative children with leprosy—tuberculoid and indeterminate cases—should be allowed to stay in the preventorium, and that there should be special accommodations for lepromin-positive children who have left the leprosy asylums. Reasons given for the internment of noncontagious children in preventoria are: they are not contagious; they are easily cured; they should not be removed from social contact with persons of their own age; and there is a possibility of superinfection. Conditions which should be laid down for the stay of such children in preventoria are suggested. Regarding the methods of treatment and the curability of leprosy in children, there are presented 13 cases of children cured without any specific treatment, and also 9 cases of children from 3 to 14 years old with indeterminate or tuberculoid leprosy and treated with sulfones, of whom one was cured while the others showed regression of the lesions.

—O. DINIZ

SALOMÃO, A. O problema do prematuro no preventório. [The problem of the premature in the preventorium.] *Arq. mineiros Leprol.* **11** (1951) 142-147.

The author, as chief of the preventorium service of the leprosy service of Minas Gerais has been preoccupied with the high infantile mortality in these establishments. The attendants working in them believe that it is due to the deplorable state of the children on admission, for generally they are much below normal weight. The author goes into the question of prematurity, and suggests that prenatal care should be given expectant mothers in order to reduce the number of premature births. —O. DINIZ

PROCOPIO, G. Importância das doenças do aparelho digestivo na evolução e propagação da lepra. [Importance of diseases of the digestive tract in the evolution and propagation of leprosy.] *Arq. mineiros Leprol.* **10** (1950) 158-164.

The author states that patients in the Santa Marta colony, in Goyaz, after having undergone many kinds of treatment, improved rapidly not only as regards the disease of the digestive system but also as regards leprosy itself without any treatment for the latter. Most of the patients suffer from intercurrent diseases which impede the action of antileprosy drugs, and this applies especially to diseases of the digestive tract. He supports the view of Rogers and Muir that gastrointestinal diseases are perhaps the most powerful predisposing causes of leprosy, believing that they are the principal cause of the diffusion of leprosy and of failure of treatment. In the former respect they are more important than undernourishment. Various observations are cited in support of his views.

—O. DINIZ

GATTI, J. C. and CARDAMA, J. E. Sobre la clasificación de las formas clínicas de la lepra y estados de reacción. Nuestra opinion respondiendo a una encuesta de H. W. Wade. [On the classification of the clinical forms of leprosy and the reaction states; our opinion replying to an inquiry by H. W. Wade.] *Rev. argentina Dermatosisif.* **36** (1952) 229-235.

The authors sum up that their opinion about classification is in full agreement with that approved by the Havana Congress, thus satisfying the [main part of the] Wade memorandum. They do not, however, accept his suggestions of making a special form of the neural [pure polyneuritic] cases because, they believe, most cases can by routine methods—histology, immunology and bacteriology—be classified among the three officially adopted forms. Concerning reactional conditions, they propose to call "lepromatous leprotic reaction" (*reacción leprótica lepromatosa*) the reaction occurring in that type, and to employ the term "leprous reaction" for all of the other reactional conditions. They discuss the role of the reactions on the subsequent evolution of the disease and their possible influence on the mutations of the clinical forms. An explanatory diagram completes the presentation.

—G. BASOMBRIO

GAY PRIETO, J. and CONTRERAS, F. Memorandum referente a la clasificación de la lepra. Contestación a una encuesta del Doctor Wade. [Memorandum on the classification of leprosy; reply to an inquiry by Wade.] *Actas Dermo-Sifilog.* **43** (1952) 667-674.

This is the text of the comments supplied by the authors, a condensation of which is included in the symposium which appeared in *THE JOURNAL* **20** (1952) 527. —H. W. W.

VILANOVA, X. Comentario a la propuesta del Dr. H. W. Wade sobre la clasificación de la lepra. [Comments on Wade's proposals on the classification of leprosy.] *Actas Dermo-Sifiliog.* **44** (1953) 255-268.

This is the text of the comments supplied by the author, a condensation of which is included in the symposium which appeared in *THE JOURNAL* **20** (1952) 532. —H. W. W.

DHARMENDRA, MUKHERJEE, N. and CHATTERJEE, S. N. Lepromatous leprosy with exclusively localized macular lesions. *Leprosy in India* **23** (1951) 200-211.

There are described the clinical, bacteriological, immunological and histological features of cases of lepromatous leprosy with exclusively localized macular lesions. These lesions simulate those of the tuberculoid type, but can be differentiated from them by the bacteriological and histological findings and by the usually negative lepromin reaction. That these lesions are really lepromatous is confirmed by the fact that with progress of the disease many of the cases develop typical generalized lesions, as in the 8 cases whose protocols are given. Clinically these lesions are well circumscribed, erythematous, thick and succulent, the surface smooth and shiny, the margin sloping. They vary in size and number, but are usually multiple. Skin smears reveal large numbers of bacilli, often with bunches and globi, and frequently the nasal smear is also positive. Histologically, vacuolated macrophages are found, together with foamy cells in some cases. Bacilli are present in moderate to large numbers in the granulomatous mass and inside nerves. In a fair proportion of cases there are found elements of tuberculoid histology; focal distribution of the granuloma, invasion of the subepidermal zone by streaks of granuloma, and tuberculoid foci with scanty giant cells. When the lesions become generalized, the histological picture becomes more frankly lepromatous. During periods of clinical quiescence the bacilli often decrease in number. Occasionally during a stage of increased activity the lepromin test elicits a doubtful, weakly positive, or, rarely, definitely positive reaction. Such lepromatous lesions should be distinguished from truly tuberculoid ones. Their nonrecognition is ascribed chiefly to statements that a tuberculoid case is sometimes strongly positive for bacilli and negative to lepromin, or that it may change to the lepromatous type. —AUTHOR'S ABSTRACT

SOUZA CAMPOS, N. Reação leprótica tuberculóide e lepra tuberculóide reacional. [Lepra reaction. Tuberculoid lepra reaction and reactional tuberculoid leprosy.] *Rev. brasileira Leprol.* **19** (1951) 249-254.

"Tuberculoid lepra reaction" signifies a case which shows an acute reacting appearance from the beginning, whereas "reactional tuberculoid leprosy" is a reacting phase in the course of the ordinary tuberculoid form. [The abstractor remarked that the distinction between these two forms is difficult for the average leprosy worker to follow.] In addition, and allied to both the reactional tuberculoid form and the lepromatous form, is the so-called "borderline" case.—[From abstract in *Trop. Dis. Bull.* **49** (1952) 873.]

MELAMED, A. J. and FIOL, H. Vanuacación antivariólica y reacción leprosa. [Smallpox vaccination and lepra reaction.] *Rev. argentina Leprol.* **1** (1953) 10-11.

The authors present observations made on 143 leprosy patients (23 tuberculoid, 11 indeterminate and 109 lepromatous) given smallpox vaccination. Only 12 of them, all lepromatous, presented lepra reaction phenomena; 6 were among the 20 with primary-type reactions to the vaccine (30%), while the other 6 were among the 89 with reactions of the allergy-immunity type (6.9%). The authors believe that the lepra reaction in such cases is related to the vaccinal disease itself, independent of the allergy-immunity phenomenon that it determines. The interpretation of the observed facts leads them to suspect the existence of profound disturbance in the antitoxic-immunity system of the leprosy patients. They conclude that smallpox vaccination does not offer any risk in the tuberculoid and indeterminate forms, whereas in the lepromatous form it may precipitate reactional phenomena—which, however, are of little severity and are easily controlled by routine treatment.—[From the authors' summary, supplied by G. Basombrio.]

GÓMEZ ORBANEJA, J. and GARCÍA PÉREZ, A. Eritema nodoso en la lepra. [Erythema nodosum in leprosy.] *Rev. clín. española* **41** (1951) 14-23.

The authors report on studies of the relationship between the nodular erythema nodosum lesions of leprosy and those of ordinary erythema nodosum, comparing the clinical and histological characteristics of the two conditions. They conclude that: (1) etiologically, the nodular syndrome of leprosy differs from erythema nodosum; (2) pathogenic considerations indicate that the two conditions may be analogous; (3) clinically, although there are some similarities there are also many differential points, and the two conditions are not the same; (4) histologically, the early phases of the leprosy lesions show close similarities to those of erythema nodosum, but the subsequent lesions—which do not always follow—are totally different. No further conclusions can be drawn until the problem of ordinary erythema nodosum is definitely solved.—[From abstract in *Excerpta Med.* **6** (1952) 256.]

SALOMÃO, A. Eritema nodoso de etiologia leprotica em criança. [Erythema nodosum of leprotic origin in children.] *Arq. mineiros Leprol.* **11** (1951) 211-215.

After discussing the several possible causes of erythema nodosum, the author reports a case whose leprotic etiology was proved by histopathology. Pediatricians in countries of high leprosy incidence should be aware of this particular cause of the syndrome. The differential diagnosis from other forms of erythema is discussed. —O. DINIZ

KONO, M., TSUGAMI, H. and SAKURAI, H. On serum protein components and leucocyte percentage of erythema nodosum leprosum. *La Lepro* **21** (1952) 98-102 (in Japanese; English abstract, p. 98).

Results of analyses of the serum proteins with Tiselius' electrophoresis and of leucocyte counts in erythema nodosum leprosum were as follows: At the stage of fading after the height of the erythema, there were decrease of γ -globulin and increase of albumin and α -globulin. The β -globulin level was higher than in lepra tuberosa, and did not go down at

this stage. There was a larger leucocyte increase at the time of vanishing of the erythema than at the peak of the condition. The neutrophils and eosinophils showed no change. No correlation was found between the serum-protein fractions and the percentages of leucocytes.—[From the abstract.]

RODRIGUES DE SOUZA, A. Fenómeno de Sanarelli-Shwartzmann—a propósito da lepra de Lúcio. [The phenomenon of Sanarelli-Shwartzman in connection with the Lucio form of leprosy.] *Rev. brasileira Leprol.* **19** (1951) 161-165.

The author describes a case of leprosy which he considers to be one of the "Lucio" form, with severe reaction and the formation of many small abscesses which burst, discharging blood and pus. Smears were at first strongly positive for bacilli, but after 3 years treatment with diasone they became negative. He propounds a theory that the cause of this form of the disease corresponds to the "Sanarelli-Shwartzmann phenomenon." In that phenomon, if a sublethal dose of cholera vibrios is injected in an experimental animal and followed the next day by a minute dose of cholera or proteus culture intravenously, diffuse hemorrhagic lesions are produced.—[From abstract in *Trop. Dis. Bull.* **49** (1952) 406, supplied by L. de Souza Lima.]

DHARMENDRA, CHATTERJEE, S. N. and SEN, N. Treatment of leprosy with novotrone. *Leprosy in India* **23** (1951) 154-160.

Novotrone is a sulfone derivative manufactured in India, similar to sulphetrone in composition and found to be equally efficacious. Of 27 outpatients treated, all but 1 lepromatous, 12 were given orally daily doses of 1-3 gm., and 15 were treated twice weekly with intramuscular injections of 1-4 cc. of a 50% aqueous solution. The drug was found quite effective and free from toxic effects; its continued use for 8 to 12 months did not produce any appreciable fall in hemoglobin and red blood count.

—AUTHOR'S ABSTRACT

SANCHEZ NAVARRO, J., CABRERA, J. M. P. and ARAMBURU, N. D. La diamino-4-4-difenil sulfona en el tratamiento de la lepra. [The 4,4'-diaminodiphenylsulfone in the treatment of leprosy.] *Rev. argentina Leprol.* **1** (1953) 5-6.

The authors report their experience with this drug in an outpatient clinic and relate several cases in which it was found to be effective, recommending its use as routine treatment.

—G. BASOMBRIO

JUCOVSKY, J. Sobre a autoseroterapia sulfonada na lepra. [On the sulfonated autoserum therapy of leprosy.] *Rev. brasileira Leprol.* **19** (1951) 166-192.

Twenty-five patients were treated with a combination of promin and injections of serum derived from their own blood. Among the improvements noted were subjective lessening of symptoms and 56% improvement in the erythrocyte counts. All of the patients with reactions benefited; some patients showed improvement of the skin lesions. There is nothing to indicate how much of the results were due to promin and how much to the serum.—[From abstract in *Trop. Dis. Bull.* **49** (1952) 411, supplied by L. de Souza Lima.]

MELAMED, A. J. and JONQUIERES, E. Tuberculosis en enfermos afectados de lepra. Acción de las sulfonas. [Tuberculosis in leprosy patients; effect of the sulfones.] *Rev. argentina Leprol.* **1** (1953) 14-21.

In this study of 19 leprosy patients with tuberculosis, there was seen a probable activating effect of the sulfones upon the tuberculous lesions, and a lack of preventive and curative effect on the tuberculosis. There is an absence of apparent connection between the immunity mechanisms (acquired resistance) of leprosy and tuberculosis in lepromatous patients, a concept which can possibly be applied to indeterminate cases with negative Mitsuda reactions. No conclusion could be reached regarding the tubercloid form. In the leprosy-tuberculosis combination the prognosis is improved by the use of streptomycin, PAS, TB-1, and calciferol.—[From author's summary, supplied by G. Basombrio.]

FRANCIS, J. The distribution of sulphone in the tissues of various animals. *J. Comp. Path.* **63** (1953) 1-6.

Concentrations of sulfone were higher in the liver than in the blood of the mouse, pig, dog and sheep, but not of the bovine. The concentrations were not consistently higher in the skin than in the blood of mice, pigs, dogs and sheep. In the bovine they were lower. The concentrations in other tissues differed little from those in the blood. The lower concentrations in the tissues of the bovine may partly explain the lower toxicity of sulfone in this species. Concentrations in the brain of sheep were only slightly lower than in the blood, whereas in the adult bovine they were much lower. This may explain the much lower tendency of cattle than sheep to develop nervous symptoms. Concentrations of sulfone in the brain of young mice were relatively and absolutely greater than in old mice, which again may explain the greater liability of young than old mice to develop nervous symptoms. —AUTHOR'S SUMMARY

ARCURI, F. and CANNATA, C. Il tiosemicarbazone nel trattamento della lebbra. [Thiosemicarbazone in the treatment of leprosy.] *Minerva Derm.* **26** (1951) 144-160.

A report of results obtained in 5 months in 12 patients treated with TB-1/698 (Tiobicina Maggiori) in daily doses gradually increasing from 50 to 150 mgm. The authors' opinion on tolerance and therapeutic action is very favorable. Toxic effects such as digestive and blood disturbances were always negligible, and preventable. The therapeutic effects were obtained mostly in the various lesions of the nodular and early forms and on the Hansen bacilli. Certain hypotheses on the mechanism of action of the TB-1/698 drug are presented with consideration of the plasma protein picture, the reticuloendothelial reactivity, and the condition of the liver, which shows mainly a hypertrophic interstitial hepatitis dependent upon the specific reticulohistiocytic granulomatous infiltration.—[From authors' summary in *Fontilles* **3** (1952) 201.]

DHARMENDRA and CHATTERJEE, K. R. Thiosemicarbazone in the treatment of leprosy. *Leprosy in India* **24** (1952) 93-125.

Of the 52 cases treated with thiosemicarbazone (Siocarbazone, Albert David) over an average period of 10 months, 9 were neural and 43 lepromatous. The initial daily oral dose was 25 mgm., gradually increased to the maximum tolerated dose but not exceeding 200 mgm. Satisfactory clinical

and bacteriological improvements were observed. Special features noticed were recovery of sensation in the patches, regenerative nail changes, and growth of new hair in the affected parts. In general the drug was less toxic than the sulfones, especially with respect to the hemopoietic system. However, there was urticaria in 1 case and allergic dermatitis in 3, in 1 of which the treatment had to be abandoned. In 4 patients there was drug fever coming on after small doses (6-12 mgm.); in 2 of them desensitization was possible, but in the other 2 the treatment had to be abandoned. It is concluded that the drug is useful in cases which do not tolerate sulfones, or in which improvement on sulfones comes to a standstill.

—AUTHOR'S ABSTRACT

MONTESTRUC, E. and BLACHE, R. Le traitement de la lèpre par le thiosemicarbazone (T.B.1). [Treatment of leprosy with thiosemicarbazone (TB-1).] *Bull. Soc. Path. exot.* **45** (1952) 300-304.

Thiosemicarbazone was used in 6 cases, 3 new and 3 previously treated with sulfones, the dosage for adults being 100 mgm. daily for 6 days the first week, 150 the second, and 200 the third and following weeks, with an interval of 15 days every month. It is concluded that this drug is perhaps as good as the sulfones for skin lesions, but less so for lesions of the mucosa; that like the sulfones it is often without effect on nerve lesions; that it has less effect on the bacilli, although there is undoubted effect in early cases; that the hemolysis and hemagglutination reactions are similar to those with the sulfones, but get less progressively; and that this drug can be used successively or alternatively with sulfones in cases which do not tolerate the latter or have developed drug resistance.—[From abstract in *Trop. Dis. Bull.* **49** (1952) 1131.]

BASOMBRIO, G., GATTI, J. C. and COLOMBO, C. B. Nuestra experiencia con la tiosemicarbazona (TB-1/698) en el tratamiento de la lepra. [Experience with thiosemicarbazone (TB-1/698) in the treatment of leprosy.] *Día Médico* **25** (1953) 4-5.

Thiosemicarbazone was used for 10 adult patients, 5 lepromatous, 1 indeterminate, and 4 tuberculoid in reaction. The dosage was increased progressively and rapidly to reach 200 mgm. daily, and that was maintained continuously without rest periods. The treatment periods were from 9 to 28 months. In general, the tolerance was good; the pruritus, the urticaria-like lesions, and the slight headache and gastrointestinal disturbances were easily controlled by temporary decrease of the dose and administration of antihistamines. Only in one lepromatous case was it necessary to discontinue the medication, in the ninth month. In all of the lepromatous cases the clinical and immunological improvement was less distinct than the histological and bacteriological improvement, although no case became completely negative. In the patient with the simple inflammatory form there was clinical and bacteriological improvement, with slight immunological improvement. In the 4 reactional tuberculoid cases the immunological improvement was appreciable; obviously, it is difficult to judge in such cases by the other criteria. In summary, the results were good, but although better than with the sulfones, but with better tolerance. The longer the treatment, the better the results.

—G. BASOMBRIO

JOPLING, W. H. and KIRWAN, E. W. O'G. Toxic amblyopia caused by TB-3, a case record. *Trans. Roy. Soc. Trop. Med. & Hyg.* **46** (1952) 656-657.

After the introduction of TB-1 (4-acetylaminobenzaldehyde thiosemicarbazone; generic name, thiacetazone), further work by pharmacologists showed that certain other thiosemicarbazone compounds are more effective in the treatment of tuberculosis in laboratory animals. The most effective appears to be TB-3 (paraethylsulfonylbenzaldehyde thiosemicarbazone; called "ethiozone" by one British manufacturer), but its use in clinical medicine has been too recent for its toxic effects to have been determined. The authors report the development of toxic amblyopia in a patient with lepromatous leprosy in London who had improved steadily under treatment with TB-1 but was changed to TB-3 because of its reported superiority in experimental tuberculosis. After a month on 200 mgm. daily in divided doses he reported that blurring of vision had developed 10 days previously, and his vision was found to be 6/24 in each eye. The drug was stopped and his vision slowly returned to normal. In the meantime, treatment with TB-1 had been resumed cautiously. —H. W. W.

SINHA, S. C. P. Observations on treatment of leprosy with streptomycin and dihydro-streptomycin. *Patna J. Med.* **25** (1951) 175-178.

A summary of the treatment of 245 cases over a period of 2 years, of which 100 were treated with streptomycin and dihydrostreptomycin with a 2-year observation period. Toxicity is no hindrance, but the cost is heavy. Clinical response was quickest in lepromatous early nerve type [*sic*]. Dermal and mucous-membrane lesions also respond rapidly. Relapse occurred in 25% during the 2-year observation period, and continuation treatment with DDS is advised. Another 100 cases were treated with sulfones, diasone or DDS, and observed for 9 to 12 months; DDS was superior to diasone as well as cheaper. Combinations of streptomycin and a sulfone were used in 35 cases, also observed for 9-12 months; these produced good clinical response at less expense. Thiosemicarbazone was used in 10 cases observed for 6 months, with promising results.—[From abstract in *Excerpta Med.* **6** (1952) 391.]

SECRET, E. Essai de traitement de la lèpre par l'isoniazide. [A trial of leprosy treatment with isoniazid.] *Maroc Méd.* **31** (1952) 551-553.

Three lepromatous cases were treated with rimifon, 4 tablets (50 mgm. each) a day. The patients had distressing complications such as nerve pains and fever. After 4 months of treatment the first two patients treated were much improved clinically. The third patient was treated later and he also had made much improvement within a month. The author considers that the results obtained justify further trial of the hydrazine derivatives of isonicotinic acid. One of the outstanding effects noted was the rapid rarefaction of lepra bacilli in the nose.—[Abstract from *Trop. Dis. Bull.* **49** (1952) 1131.]

DINIZ, O. and DA COSTA CARVALHO, G. Tratamento de lesões residuais da lepra lepromatosa pela istionina. Nota previa. [Treatment of the residual lesions of lepromatous leprosy with histionine; preliminary note.] *Arq. mineiros Leprol.* **11** (1951) 133-141.

In patients whose smears showed fragmented bacilli or granular forms

which resist the usual forms of treatment, the authors employed intravenous injections of histionine (diaminophenthiazine chloride 20 mgm. in 10 cc. of 4.7% glucose). Four such patients were treated, beginning with 2.5-3 cc. daily with weekly increases of 0.5-2 cc. After 22 days of treatment (totals of 50, 70 and 80 cc., respectively) 3 of the patients had become negative. They have remained negative for 6 months, the injections being continued. The fourth patient, who received 270 cc. over a period of 82 days, showed only diminution in the number of granules. The treatment was carried out without any mishap. Notwithstanding the good results obtained, conclusions await further experience. —AUTHOR'S ABSTRACT

SATO, S. Studies on the chemotherapy of leprosy. I. Cepharranthin. *Tohoku J. Exper. Med.* **55** (1952) 341-347 (English summary).

Cepharranthin is not effective in the treatment of leprosy, and is not to be compared with chaulmoogra oil or the sulfone drugs. Cepharranthin shows neither curative nor preventive activity on experimental rat leprosy. —[From the author's summary.]

SATO, S. and CHIDA, F. Studies on the chemotherapy of leprosy. II. Koha. *Tohoku J. Exper. Med.* **55** (1952) 349-353 (English summary).

Koha No. 1 or Lumin, and Koha No. 12, which belong to the photosensitizing cyanine dyes, are not effective in the treatment of leprosy and are not to be compared with chaulmoogra oil or the sulfone drugs. All of these drugs have no influence on the course of experimental rat leprosy. —[From the authors' summary.]

GUIMARAES, A. S. Método de sulfato de cobre para a determinação do peso específico de sangue total e de plasma, seu emprego na lepra. [Copper sulphate method for the determination of the specific gravity of whole blood and of plasma; its use in leprosy.] *Arq. mineiros Leprol.* **11** (1951) 102-107.

The author points out that she is merely describing a laboratory method of great practical utility by which various hematological indices and the protein content of the blood can be determined. The indices determined by this method are chiefly: hemoglobin (2% error); hematocrits (2% error) and globules (slightly larger error), from which conclusions can be drawn regarding the type of anemia. There can also be established (1) diminution of plasma volume, shown by increase of hemoglobin, determining also whether this diminution is due to a loss of water (dehydration for various reasons) or to a loss of protein (extravasation resulting from trauma, etc.); (2) the therapeutic treatment necessary: administration of total blood, physiological serum or blood plasma; (3) the efficiency of treatment by observing its effects. The technique consists in letting drops of blood or plasma fall into solutions of copper sulphate of known specific gravities. These drops, surrounded by a sheath of copper proteinate, remain at rest for 15 to 20 minutes after which they sink to the bottom or rise to the surface. If the drop sinks, the specific gravity of the blood is the same as that of the copper sulphate solution. From a previously prepared table the protein content corresponding to the density of the solution can be determined. The hemoglobin and the hematocrit content can also be found in the same table, while other data such as the average globular content and the total number of globules can

be determined by previously established methods of calculation. The author suggests employing the method in every dispensary and colony, with batteries of copper sulphate solutions made at a central laboratory.

—O. DINIZ

MADDOCK, R. K. Skin scrapings in leprosy; positive results by the Wayson technique in 84 supposedly arrested cases. *J. American Med. Assoc.* **148** (1952) 44-45.

The technique given is said to be one developed and modified from previous methods by Wayson, in Honolulu, between 1927 and 1935. The skin is pinched tightly to blanch it, an incision is made through its full thickness, with the corner of a single-edged razor blade, the blade is then rotated and the cut surface scraped as the blade is brought back to the starting point of the incision, the entire procedure being accomplished in three motions. The material so obtained is spread on a new slide, never previously used. The special features claimed are that the sample is obtained from the entire thickness of the skin rather than from only the superficial layers, and that an effort is made to minimize dilution with blood and tissue juices. The author points out several factors regarded as extremely important in determining the findings in skin scrapings: (a) the number of organisms present in the skin; (b) the thoroughness with which the preparation is examined, (c) the site chosen for sampling, which involves thorough clinical knowledge of leprosy; and (d) the technique of performing the skin scraping, a factor the importance of which is not thoroughly appreciated. The method described was applied to 84 patients at the Carville leprosarium who, on the basis of not less than monthly examinations for at least a year, were considered bacteriologically negative and otherwise qualified for release from the hospital. Although only a single attempt to demonstrate bacilli was made in each case, 19 of them were found positive.

—F. A. JOHANSEN

ALVAREZ, W. C. Diagnosis of macular leprosy. *J. American Med. Assoc.* **148** (1952) 668 (correspondence).

Referring to the note by Maddock dealt with in the preceding abstract, the writer recalls that his father, L. F. Alvarez, had devised a highly successful method of seeking the leprosy bacillus in macular cases. A tiny bit of skin was snipped off with scissors and ground up in a mortar with a few drops of water, and the resulting suspension was spread on a slide and stained. Acid-fast bacilli were "commonly" found. The method was reported only at the Berlin Conference in 1897 [the *Transactions*, vol. 2, pp. 123-124].

—H. W. W.

WADE, H. W. Skin scrapings in leprosy. *J. American Med. Assoc.* **149** (1952) 1595 (correspondence).

The method described by Maddock as a new technique [see above] is the long-established "scraped-incision" (not "snip") method, with nothing new except for the insistence that the cut be made through the full thickness of the skin. That feature is held to be neither necessary nor desirable, and if there is any advantage that would be offset by the facts that apparently the incision is scraped only once and only one site is examined. The important features of the scraped-incision method, introduced in practice in Manila by the author about 1917-1918 and described repeatedly

in the literature, are (a) to make an actual cut "deep into the skin" by any suitable instrument; and (b) to obtain tissue juice and pulp by adequate scraping, with minimal blood. The usual need of making multiple smears is pointed out. Also that there is no need to use a new slide (or blade) for every examination if used ones are properly cleaned. An experience of a colleague in Manila who applied the scraped-incision method, which parallels that of Maddock at Carville, is related.

—AUTHOR'S ABSTRACT

AZULAY, R. D. and CEZAR DE ANDRADE, J. M. Índices de positividade bacterioscópica nos tipos histológicos indeterminado e tuberculóide encontrados na lepra. [Indices of bacteriological positivity in the indeterminate and tuberculoid histological forms of leprosy.] Rev. brasileira Leprol. **20** (1952) 20-21.

The authors report their bacteriological findings in 1,096 skin biopsy specimens from cases of the indeterminate and tuberculoid forms, the sections stained for bacilli by the Ziehl-Klingmüller and Gram-Weigert methods. Of the indeterminate specimens, 5.2% were positive; of the quiescent tuberculoid, 0.37%; of the reactional tuberculoid (typical and borderline), 51.1%.—[From the English summary.]

AZULAY, R. D. A pesquisa do *Mycobacterium leprae* pelos métodos de Gram-Weigert e Ziehl em córtex histológicos e pelo método de Ziehl-Gabbet em esfregaço. (Estudo comparativo de 355 casos.) [The examination for *M. leprae* in histological sections stained by the Gram-Weigert and Ziehl methods and in smears stained by the Ziehl-Gabbet method; comparative study of 355 cases.] Rev. brasileira Leprol. **20** (1952) 22-25.

Analysis of the findings after the procedures indicated in the title leads to the following conclusions: (a) Most positive results are obtained when the 3 techniques were used together; in this case there is no need of repeating the examination with further sections. (b) If one has to choose between the smear technique and the histopathological technique, the former is better because one can repeat the examination as many times as desired on account of the ease of making new slides without needing the presence of the patient. However, the histopathological technique (the sum of the Gram-Weigert and Ziehl-Klingmüller stainings) gave more positive results (45.35%) than the smear technique (40.84%).—[From the English summary.]

FLOCH, H. and DESTOMBES, P. Caséification et calcification des nerfs dans la lèpre tuberculoïde. [Caseation and calcification of nerves in tuberculoid leprosy.] Arch. Inst. Pasteur Guyane et Terr. Inini, Publ. No. 238, 1951, August, 4 pp.

The authors report a rare case of calcification of the cubital nerve in a case of tuberculoid leprosy, this being the last stage of a caseous process commonly described as "nerve abscess," which is specific to tuberculoid leprosy and is itself rare.—[From abstract in *Trop. Dis. Bull.* **49** (1952) 872.]

FERNANDEZ, J. M. M. Relaciones inmuno-alérgicas entre tuberculosis y lepra. [Immunoallergic relations between tuberculosis and leprosy.] Actas Dermo-Sif. **43** (1951-52) 471-496.

It has been shown that BCG inoculation may produce resistance to leprosy. Positive lepromin reactivity is known to occur in spontaneous tuberculosis, and in 1939 the author succeeded in transforming negative Mitsuda reactors to positive in 91.8% of 123 children by intradermal BCG inoculations. Similar results have since been obtained by oral administration of BCG. Further study is needed to determine whether the positive reactivity induced by BCG has the same value in indicating resistance as that produced spontaneously. In the meantime, however, BCG should be used systematically in lepromin-negative persons living in endemic areas, since the vaccine is not dangerous and, if it proves effective, it promises to eliminate leprosy. The effect of lepromin on tuberculin sensitivity is less clearly established. Attempts to produce sensitivity to tuberculin with lepromin in healthy children resulted in Mantoux reactions that were positive in 1 case, negative in 8, and doubtful in 11. In another group of 15 children with positive reactions, the Mantoux reaction became negative in 9 following repeated injections of protein lepromin. Fernandez believes that lepromin may be successfully used to produce therapeutic desensitization in persons with tuberculin hypersensitivity.—[From abstract in *J. American Med. Assoc.* **150** (1952) 1048.]

FLOCH, H. Sur la vaccination par le BCG en prophylaxie antilépreuse. Étude de la para-immunité et de la para-allergie entre lèpre et tuberculose. [Vaccination with BCG for the prophylaxis of leprosy; a study of para-immunity and para-allergy between leprosy and tuberculosis.] *Arch. Inst. Pasteur Guyane et Terr. Inini*, Publ. No. 249, 1951, December, 14 pp.

A group of 144 patients of different types were inoculated with two antigens: lepromin diluted 1/750, and BCG diluted to contain a similar number of organisms. Of the 46 tuberculoid cases, 43 gave positive reactions to both antigens, 2 were BCG positive and Mitsuda negative, and 1 was negative to both. Of the 40 lepromatous cases, only 2 were positive to both, 12 were BCG positive and Mitsuda negative, and 26 were negative to both. Of the 58 indeterminate cases, 33 were positive to both, 10 negative to both, and 14 BCG positive and Mitsuda negative; one was Mitsuda positive and BCG negative. It is concluded that *M. tuberculosis* is able to bring about a condition of para-allergy *vis-a-vis* *M. leprae*, and that to a less extent the latter may produce para-allergy *vis-a-vis* the former; but this can be done only by tubercle bacilli. Both bacilli are able to create crossed para-allergy and para-immunity, but *M. leprae* to a less extent than *M. tuberculosis*.—[From abstract in *Trop. Dis. Bull.* **49** (1952) 875.]

FLOCH, H. Le traitement sulfoné peut modifier la réponse du test de Mitsuda chez les lépreux indifférenciés. [Sulfone treatment is able to modify the response to the Mitsuda test in indeterminate cases of leprosy.] *Bull. Soc. Path. exot.* **45** (1952) 295-300; also *Inst. Pasteur Guyane et Terr. Inini*, Publ. No. 253, 1952, January.

This study is of 43 children, 25 with indeterminate and 18 with tuberculoid leprosy. Of the former group, only 12 (48%) were Mitsuda positive before sulfone treatment, but after treatment for periods of from 22 months to 4½ years, 21 (84%) reacted positively. Thus 9 of those originally negative had become positive. There was very little change in the reactions of the tuberculoid cases. It is concluded that in indeterminate

leprosy the change from negative to positive under the influence of sulfone therapy indicates an increase of resistance to the Hansen bacillus and a favorable prognosis.—[From abstract in *Trop. Dis. Bull.* **49** (1952) 1130.]

DE ALMEIDA, J. O. and DE SOUZA CARVALHO, R. P. Estudos sôbre a serologia da lepra. [Study of the serology of leprosy.] *Rev. brasileira Leprol.* **20** (1952) 30-31.

The authors have applied the quantitative complement fixation technique of Wadsworth, Maltaner and Maltaner in the study of sera of patients with the lepromatous form of leprosy. Good results have been obtained, and the possibility of excluding false positive reactions for syphilis would be sufficient to recommend the adoption of this technique.—[From authors' summary.]

KVITTINGEN, J., CUTLER, J. C., AMADOR GUEVARA, J., MCCULLOUGH, J. C., ROSE, E., FORD, V., TAMPI, R. B., SEN, S., LAKSHWIR, KHAN, J. and DASS, P. Serological tests for syphilis in lepers; tendency for various antigens to give false-positive reactions. *Bull. World Hlth. Org.* **5** (1952) 481-504.

These authors carried out serum tests for syphilis on 821 cases of leprosy, employing 3 different reactions: the Meinicke (MKIR), the VDRL (various antigens), and the Kahn. In the first four groups examined the following positive results were obtained:

| | | |
|---------------------------|----------------|-------------|
| Group 1: Meinicke, 3.2%; | VDRL, 4.4%; | Kahn, 40.8% |
| Group 2: Meinicke, 19.0%; | VDRL, 37.0% | |
| Group 3: Meinicke, 21.6%; | VDRL, 36.5%; | Kahn, 27.0% |
| Group 4: Meinicke, 14.4%; | VDRL, {16.9%-} | Kahn, 30.4% |
| | {40.2% } | |

The results in further series were similar but two different VDRL antigens gave discrepant results, and when sera were retested in a follow-up survey the results showed considerable variation. In general, the Meinicke reaction gave fewer positive results than either of the others. [But the antigen employed may have been a relatively insensitive one, see Ghorpade, *Bull. Hyg.* **27** (1952) 1021.] It is possible that in some cases the positive reactions were due to a concomitant syphilis, but it is probable that most of them with the VDRL and Kahn were "biologically false"; evidently both crude and cardiolipin antigens were at fault.—[From abstract in *Trop. Dis. Bull.* **49** (1952) 967.]

KVITTINGEN, J. Behavior and stability of serum reagins in false-positive serological tests in leprosy. *Bull. World Hlth. Org.* **5** (1952) 505-511.

Sera from nonsyphilitic leprosy patients tended to give strongly positive reactions with the VDRL and Kahn tests, and negative results with the Meinicke test. The positive reactions usually showed very coarse and compact floccules, but the titers were surprisingly low. When these sera were kept at room temperature the strength of the reaction tended to weaken, and when they were heated for 5 minutes at 65°C. the reactions reverted to negative. This did not happen in the case of syphilitic sera. The Meinicke reaction differs from the other two in that the sera are tested unheated, and the antigen contains balsam of tolu instead of cholesterol. It is suggested that increase in the blood cholesterol and changes in

the calcium content of the blood in leprosy may account for the false positive reactions when an antigen containing cholesterol is used.—[From abstract in *Trop. Dis. Bull.* **49** (1952) 967.]

PORTNOY, J., GALVEZ, R. and CUTLER, J. C. Clinical and serological studies with reference to syphilis in Guatemala, Central America. III. Studies of comparative performance of the Kahn, Kolmer, Mazzini and VDRL tests among leprosy patients. *American J. Syph., Gonorr. & Ven. Dis.* **36** (1952) 566-570.

This is a report of serologic findings in a group of leprosy patients examined in connection with studies on the behavior of serologic tests for syphilis utilizing both cardiolipin-lecithin and crude beef-heart antigens. The sera of 51 patients in the leprosarium just outside of the city of Guatemala were tested. The duration of the disease was 3 years or longer, the majority giving a history of leprosy for 10 years or more. Of the group 24 had the podalic form of leprosy, 19 the cutaneous form, and 8 the neural form. An analysis of the performance of each test in the battery is shown in a table. The levels of seroactivity differ between the five tests in approximately the same manner, regardless of the population groups so far tested in Guatemala, i.e., the Mazzini usually shows the greatest seroactivity, the Kahn test closely approximates the Mazzini, while the VDRL and the two Kolmer tests produce the lowest levels of seroactivity.—[From authors' summary, supplied by F. A. Johansen.]

PORTELLA, O. B. and DE ALMEIDA, J. O. Reações de microfloculação com cardiolipina e sitolipina em soros de leprosos. [Microfloculation reactions with cardiolipin and sitolipin in leprosy sera.] *Rev. brasileira Leprol.* **20** (1952) 32-40.

The authors studied the sera of 152 patients with lepromatous leprosy using the VDRL slide test with cardiolipin and sitolipin. Agreement was found in 65%, relative agreement in 27%, and disagreement in 8%. The results with the two antigens were quite similar; cardiolipin gave 27% positives and sitolipin 31.6%. The same sera were tested with the 50% endpoint complement-fixation test of Wadsworth, Maltaner and Maltaner, with which only 5% gave positive results. It is concluded that false positive reactions are common with both cardiolipin and sitolipin in the microfloculation test, as a function of the technique involved rather than of the phospholipids themselves.—[From the English summary.]

HONDA, H., YOSHINO, K. and KUWANO, S. On seroreaction of leprosy with cardiolipin-kephalin antigen. Part 2. Amino acid components of serum protein in leprosy. *La Lepro* **21** (1952) 120-124 (in Japanese; English abstract, p. 120).

The results of our recent work, that the antigen of cardiolipin cholesterolin kephalin, especially ethanol amine, phosphatidyl serin and phosphatidyl inositol increased the specificity to leprosy serum, lead to the conclusion that the antigen-antibody reaction is a combination of the serine OH radical of the polypeptid chain in serum antibody and the carboxyl radical of the kephalin fraction. The antigen of sphingomyelin gave positive results in 40% of lepra nervosa.—[From the abstract.]

MUKHERJEE, A. Differentiation of the human and rat leprosy bacilli by irradiation. *Leprosy in India* **23** (1951) 196-200.

The author studied the effect of different irradiations and of moist heat on the acid-fastness of the mycobacteria of human and rat leprosy in smears. This property of the human bacillus was significantly altered by exposure to sunlight for 5 hours (the maximum temperature attained being 48°C.), to infra-red rays for 2 hours (lamp working at 125 volts with 5 amperes, the smears placed 2 feet away, maximum temperature 58°C.), to ultraviolet rays for 2 hours (lamp working at 220 volts, 60 cycles, 6 amperes, the slides placed 3 feet below the lamp), or to roentgen irradiation for ½ hour (150 K.V.P. plant with 0.5 mm. copper filter, the slides placed 1.5 meters below the source of rays; dose 42r). Smears were exposed to the effect of moist heat at 75°C. in the hot air sterilizer. Under similar conditions rat-leprosy bacilli were not affected in this respect. It is suggested that such changes are produced by phytodynamic action on the bacterial cells. [These findings confirm those of Dharmendra and Mukherjee (Memoirs, 5th Internat. Congress, 1949, p. 689) regarding the staining properties of these two types of bacilli after irradiation with sunlight and ultraviolet rays.] —DHARMENDRA

BARNETT, M. and BUSHBY, S. R. M. The activity of isonicotinic acid hydrazide in murine leprosy. *Leprosy Rev.* **24** (1953) 19-26.

In this work, done in the Wellcome Research Laboratories in England, the animal used was the white mouse, the route of inoculation intravenous. Treatment was begun on the day of inoculation. The drugs used were isoniazid, DDS, sulphetrone, TB-1 and streptomycin, given in the food except the streptomycin which was injected subcutaneously, usually twice daily (5 days a week). The doses were the highest the animals would tolerate. The experiment was terminated on the 180th day. For lack of visible lesions in most instances, the effect of treatment was assessed by the degree of enlargement of the spleen, the histological findings in the liver, spleen and skin, and the numbers of bacilli in smears of the liver and spleen. On all of these counts the sulfones had only a doubtful effect on the development of the disease; isoniazid, on the other hand, almost completely suppressed the infection; streptomycin was almost as effective, TB-1 somewhat less so. Although it is admitted that the validity of this way of forecasting the chemotherapeutic effect of drugs in human leprosy is open to question, an attempt is made to argue that the activity against the Stefansky bacillus also applies to that of Hansen. (In previous work, unpublished, they used the subcutaneous route and the leproma produced as the measure of effect of the drugs used; in a five-month observation period streptomycin had had a discernable but small effect, the sulfones none at all.) —H. W. W.

YOSHINAGA, T. The influence of X-ray to the leproma of rat leprosy. (The first report.) *La Lepro* **21** (1952) 79-81 (in Japanese; English abstract, p. 79).

This is a report of the application of X-rays in various intensities to the lepromas produced in the chest muscle of the white rat by inoculation of *M. leprae muris*. There were some recession of the lepromas, decreased round-cell infiltration of the connective tissue, destruction of the leproma cells, increase of the connective tissue, and other changes.—[From the abstract.]

YOSHINAGA, T. The influence of X-ray application toward rat leprosy. (The second report.) (The influence upon lymphatic gland.) *La Lepro* **21** (1952) 82-85 (in Japanese; English abstract, p. 82).

Following the work dealt with in the first report, X-rays were applied to the lymphatic glands of white rats with rat leprosy, with somewhat remarkable results. There was rapid reduction of the size of the lymphatic glands, and distinctive histological changes were found.—[From the abstract.]

USHIO, K. Studies on the influence of hyaluronidase against rat leprosy. Studies on the rat-leprosy (20). *La Lepro* **21** (1952) 86-88 (in Japanese; English abstract, p. 86).

The dissemination of rat leprosy bacilli was more marked in the groups treated with hyaluronidase than in the untreated group (control). Moreover, their dissemination from the site of inoculation site to the other organs was increased with increase of the injections of hyaluronidase. The leprosy granuloma was not accelerated by hyaluronidase.—[From the abstract.]

USHIO, K. and HIRAMOTO, T. Studies on the influences of hyaluronidase and desoxycorticosterone acetate to rat leprosy. Studies on the rat leprosy (21). *La Lepro* **21** (1952) 89-92 (in Japanese; English abstract, p. 89).

The influence of hyaluronidase and desoxycorticosterone acetate on rat leprosy has been studied. It was found that hyaluronidase accelerates the dissemination of rat leprosy bacilli and promotes the rat leprosy granuloma, compared with the controls, but not desoxycorticosterone acetate.—[From the abstract.]

NISHIMURA, S. and MICHYUKI, K. On serum protein components of murine leprosy. *La Lepro* **21** (1952) 103-107 (in Japanese; English abstract, p. 103).

The serum protein components were examined by electrophoresis in 28 rats with marked, slight and inapparent infections, and in normal animals. In neither the marked nor the slight cases of murine leprosy did the α -globulin and albumin levels differ from those in the normal rats. The sizes of the lepromas were not proportional to the amount of α -globulin. There were differences among the results of the measurements, but they were of no value from the statistical point of view. These results show that human and murine leprosy are quite different as regards the serum protein components, and supply us a standpoint for the study of α -globulin increase in lepra tuberosa.—[From the abstract.]

TANIMURA, Y. Experimental study on immunology of murine leprosy. (Part 2.) On skin reaction of murine leprosy. *La Lepro* **21** (1952) 108-113 (in Japanese; English abstract, p. 108).

Both infected and normal rats showed identical tissue reactions (induration) to the murine leprosy antigen, and this reaction was also caused by other non-pathogenic acid-fast. In other words, no specific negative reaction like that in lepra tuberosa in human beings was observed in murine leprosy. This reaction cannot be explained by allergy, from the

symptoms and the histological examinations of the skin.—[From the abstract.]

6 TANIMURA, Y. Experimental study on immunology of murine leprosy. (Part 3.) On prevention function of Shwartzman substance against onset of murine leprosy. *La Lepro* **21** (1952) 114-119 (in Japanese; English abstract, p. 114).

This work on the Shwartzman substance which prevents the onset of murine leprosy revealed the following facts: The suspension of murine bacilli contains the Shwartzman factor. The Shwartzman phenomenon occurs in white rats as hyperemia and bleeding in the viscera or lymph nodes, not as a skin reaction. The substance which contains the Shwartzman factor did not prevent the onset of murine leprosy.—[From the abstract.]