ABSTRACTS

T. Suzuki, writing in the **Science Reports of the Research Institute, Tohoku University,** Vol. 6, No. 1, 1955, p. 89-95, reports on *The Influence of Antituberculosis Drugs upon the Oxygen Consumption of Mycobacteria.*

Three hours' observation after addition of streptomycin, PAS, TB1 and INH showed more or less inhibition of the respiration of BCG, but INH showed the strongest inhibitory power, but this was least at the most viable stage of BCG. Mycobacterial strains with relatively great respiration (tubercle bacilli of birds and cold-blooded animals and non-pathogens) showed no respiratory inhibition. The standard Warburg manometric techniques were used.

***Trop. Dis. Bulletin,** Vol. 53, No. 12, December 1956

Secondary Amyloidosis in Leprosy, by **J. S. Shuttleworth and Hilary Ross.** Ann. Intern. Med., 1956, July, Vol. 45, No. 1, 23-38.

In the United States the commonest cause of death in lepromatous leprosy is secondary amyloidosis. The organs of the body affected are the kidney, spleen, liver, adrenal, gastro-intestinal tract and pancreas. There is no clear correlation between the degree of leprosy and the development of amyloidosis. The first sign is progressive proteinuria leading to hypoproteinemia, followed by enlargement of the liver and spleen, nitrogen retention, anaemia and death. The Congo red absorption test is diagnostic if there is 80 to 100 per cent absorption within an hour. Persistent proteinuria is a constant finding, and must be present in order to make a diagnosis of secondary amyloidosis. When early amyloidosis is suspected it can be confirmed or otherwise by examination of biopsy material from the liver. Addison's disease due to amyloidosis of the adrenals has not been observed. The immediate prognosis depends on the development of anaemia, which, when it becomes extreme, is a sign that death is imminent. The average duration of life after the onset of proteinuria in amyloidosis was 38.33 months, with a wide range above and below that figure. Secondary amyloidosis occurs in other diseases of long standing. It is believed that the amyloid material is a protein unit with a sulphate-bearing polysaccharide, deposited intracellularly.

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Observations on Leprosy among Children born in the Culion Leper Colony during the Pre-Sulphone and the Sulphone Periods, by **C. B. Lara and J. L. Ignacio.** J. Philippine Med. Ass., 1956, Apr., Vol. 32, No. 4, 189-97.

The large number of patients at the Culion Colony, the high birth rate and the impossibility of isolating all children at birth, have provided favourable circumstances for the observation of early leprosy and its natural transmission. There have been the same workers for the last 22 years, and accurate records have been kept during that time. During the pre-sulphone period 20.9 per cent of the children showed leprous lesions, while in the sulphone period it was 19.9 per cent. In the former period 95 per cent of cases occurred in the first three years of life, while in the latter period only 57 per cent occurred in the first 3 years; there was thus a delay in the onset of the disease in the sulphone period. There is also probably a lower rate of incidence in the sulphone period. Even with the small dosage of sulphone used, lepra fever and ulcers and laryngeal complications have diminished or disappeared. However, the number of negative or apparently cured cases has not increased as rapidly as hoped for, and this is partly due to patients avoiding intensive therapy because of their reluctance to leave Culion.

The Uganda Leprosy Control Scheme, by **J. A. K. Brown.** East African Med. J., 1956, July, Vol. 33, No. 7, 259-70, 4 figs. and 1 map.

A description is given by the author of the leprosy control scheme which he first introduced in Eastern Nigeria, and has now applied in Uganda. In undeveloped countries like these with high incidence compulsory segregation is impracticable. Up to 1951 there were four settlements in Uganda, and in that year a fifth was added. In Uganda the people live widely separated, and 300 yards may separate a family from its neighbours. Surveys were carried out with the help of the District Health Staffs and the chiefs, who explained to the people the objects of the survey. In the Northern, Eastern and Western Provinces and in Buganda the estimated cases were respectively: 12,500; 39,800; 7,600 and 7,900. The proportions of lepromatous type varied in the provinces, being 7.5 per cent in the Northern, 5 per cent in the Eastern, 19 per cent in the Western, and 8.9 per cent in Buganda. It is calculated that there are 4,900 lepromatous cases in all. It was considered that opening large numbers of outpatient clinics would not be efficient, as the patients would not attend regularly. In place of this treat-

ment villages of simple construction were erected, accommodating from 20 to 400 patients. Of these there are now 40. In this way the danger of spreading infection is diminished. Under average conditions all lepromatous and all child patients within 15 miles of a medical unit should be admitted to a treatment village. Treatment is with DDS 0.1 gm. tablets, beginning with 1 tablet a week and rising by one additional tablet a week every month till a maximum of 6 tablets is reached. Between 30 and 40 per cent of the patients in the country are now able to obtain treatment regularly, as compared with 5 per cent in 1951. "The rate of progress has been due to the general anxiety of the peasants about the disease, to the influence of the surveys which have stimulated local interest, and to the attempt to keep every aspect of the scheme as simple as possible."

A Record of Fifty Years' Work with the Victims of Leprosy at the Culion Sanatorium, 1906 to 1956. Republic of the Philippines Department of Health, pp. ix and 109, 4 figs.

Leprosy is supposed to have been imported to the Philippines by Chinese immigrants long before the coming of the Spaniards. In the middle of the 19th century the San Lazaro Hospital for leprosy patients was founded in Manila. In 1905 the island of Culion, some 200 miles south of Manila, was set aside as a leprosy colony. Gradually the number of patients rose till it reached its peak of 7,000 in 1935. By the end of 1941 the number was reduced to 5,500 as the result of the founding of local leprosaria on the other islands. During the war there was great scarcity of food, and of the approximately 4,000 patients left only half survived.

Many improvements were introduced after 1915 and special treatment was introduced in 1921. During the first 4 years the death rate was 64 per cent, many of the patients being in a very bad condition when admitted, but the death rate soon fell to an average of under 10 per cent, and during the last 4 years it is only 3 per cent. Much has been done, especially on the pathological and bacteriological aspects by the Leonard Wood Memorial, and by the staff it supplied to the colony, which has been responsible for much of the recent advance in our knowledge of leprosy.

One of the great difficulties at the Culion leprosarium is the guarding from infection of the children of leprous parents. It was not found possible to remove children from mothers till some 2 years after birth, as earlier removal resulted in a high mortality. Even of those separated at 6 months some 50 per cent developed the disease by the time they were 5 years old. Of 98 children admitted

to a special nursery, only one with congenital heart disease died, and none of them had developed leprosy at 5 or 6 years of age; whereas of 219 left in the colony from 1949 to 1954, 20.4 per cent became leprous. Some 18.5 per cent of the inmates are negative and 11.4 per cent of the non-leprous children. For economic and other reasons it has been found impossible to discharge these. Patients also often refuse medicine or take it irregularly, fearing that if they recover they will be discharged to the outside world, where conditions of life are more difficult.

This brochure is a memorial of the jubilee of the colony. It is divided into 6 sections dealing respectively with general history, medical services, religious and social activities, economic and legal aspects, educational and cultural services, and such problems as those just mentioned.

[This report should be carefully studied by those interested in the control of leprosy, showing as it does the results of compulsory segregation in a distant island after a long period of years.]

The Dimorphous Macular Lesion in Leprosy, by **Khanolkar.** Indian J. Med. Sci., 1956, July, Vol. 10, pp. 499-505.

Four cases of the dimorphous form of leprosy are described and illustrated by photographs of lesions and corresponding sections of biopsy material. Histological appearances characteristic of the two main types of leprosy appear in the same lesions. Bacilli were found in all four cases, and in three of them the lepromin reaction was slightly positive. It is considered that this form of the disease may be transformed into either the lepromatous or the tuberculoid type, but more frequently into the former than into the latter.

The Testis in Leprosy, by **A. L. Furniss.** Indian J. Med. Sci., 1956, July, Vol. 10, No. 7, 506-10, 7 figs. on 2 pls.

For this study biopsy material was taken from 22 patients with the lepromatous or dimorphous type of leprosy and 8 with the tuberculoid type, patients being chosen who were undergoing an operation for some other condition. In none of the tuberculoid cases was the testes affected with leprosy. No affected testes appeared normal macroscopically, most of them appearing reduced in size. The normal brown tissue was replaced with strands or patches of white fibrous tissue, and with yellow areas similar to those in leprous lymph glands. Microscopically, the tubules appeared to have an internal limiting membrane, and between the tubules there was infiltration with round cells and histiocytes, between which there were acid-fast bacilli. Later there was separation of the tubules, oedema and fibrosis. Still later the

tubules became hyaline and lost their structure. The epididymis was less affected than the testis. In 190 male patients with lepromatous leprosy there was gynecomastia in 73; but in the series of 22 who underwent biopsy there were only 2 with gynecomastia, so that it is not possible to record any correlation between even gross testicular affection and gynecomastia.

It is remarked that the atrophy of the testis which is so marked in leprosy occurs " early in the disease process and unrelated to the degree of lepromatous infiltration ". In fact, the tubular degeneration may be a reaction to an injury caused by toxin or bacterium. The possible causes of gynecomastia are discussed: " It seems that leprosy provides a good opportunity for investigating the nature and cause of the hormonal imbalance concerned in the development of gynecomastia." The reason for the common affection of the testis in leprosy is discussed. It is suggested that for some unknown reason the testes may form a nidus for the leprosy bacillus as does nerve tissue, and that if this unknown reason could be found it might elucidate the problem of culturing the bacillus. The article is illustrated with 7 photomicrographs.

***Trop. Dis. Bulletin,** Vol. 54, No. 1, January 1957

The Treatment of Deformities of the Foot in Leprosy, by **W. A. A. Hodges.** East African Med. J., 1956, Aug., Vol. 33, No. 8, 301-3, 2 figs.

Deformity initially develops in neural leprosy after there is drop foot with anaesthesia. A minor trauma leads to trophic ulceration of the toes and sole. Brand is quoted as recommending extensor tenodesis in early cases, and triple arthrodesis in more advanced conditions with ulcers. [In a more recent article (see *Trop. Dis. Bulletin,* 1955, 52, 1094), Brand recommends transplantation of the tibialis posterior tendon and after re-routing insertion into the middle cuneiform bone. This operation is proving very successful (personal communication).] The author operated on 15 patients, 10 of whom had ulceration of the sole, doing a modification of the Lambrinudi operation and extending the skin incision so as to include the ulcer. A very large wedge excision is required to produce a plantigrade foot when there is equino-varus deformity. All the patients were able to walk well after 4 months. After the operation the patients had padded plaster casts for 3 weeks, followed by walking plaster casts for 9 weeks. Two of the patients observed 15 months after the operation were walking well, had no ulcers and were able to work in the fields.

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Correlation between Tuberculin and Lepromin Reactions, by **N. Souza Campos, J. Rosemberg and J. N. Aun.** Rev. Basileira Leprologia, S. Paulo, 1955, Jan.-Dec., Vol. 23-40. English Summary.

The authors first made tuberculin and lepromin tests in 3 groups of healthy people: (a) in a group of 471 children who had had no contact with leprosy; (b) in a group of 356 children who had been in contact with leprosy; (c) in a group of 860 adults who had had no known contact with leprosy. Three groups of patients were also examined: (1) 53 children with tuberculosis; (2) 73 adults with tuberculosis; (3) 105 patients with leprosy, 93 of whom had the lepromatous form of the disease.

It was found that there was agreement between the lepromin and tuberculin reactions to a considerable degree in healthy people who had been exposed to tuberculosis but not leprosy, in healthy persons who had been exposed to leprosy when they were first exposed to tuberculous infection, and in tuberculous patients. There was almost complete disagreement between the two reactions in lepromatous cases of leprosy when infected with tuberculosis. Persons vaccinated with BCG gave a high degree of agreement between the reactions, at least for a short time after vaccination. It is stated that those infected with leprosy, but with a positive lepromin reaction, will be permanently negative to tuberculin. [It is not clear on what grounds this last assertion is based.]

Isoniazid in Lepra Reaction, by **O. B. de Macedo and F. A. Berti.** Rev. Brazileira Leprologia, S. Paulo, 1955, Jan.-Dec., Vol. 23, Nos. 1/4, 41-52. 17 refs.

After recounting the history of this drug in the treatment of tuberculosis and leprosy, the authors describe the cases of 26 lepromatous patients with lepra reaction (7 acute and 19 subacute), 1 tuberculoid and 1 dimorphous. The results of treatment with oral administration of isoniazid, 100-200 mgm. daily, are given as follows: Very good 4, good 13, no improvement 4, abandoned treatment 7. The authors consider this the best oral treatment for lepra reaction in their experience. They intend to test the effects of this drug given parenterally.

The Study of the Lepromin Reaction in Rats previously inoculated with Myco. lepraemarium *and with* Myco. tuberculosis (*BCG*), by **W. A. Hadler and L. M. Ziti.** Rev. Brasileira Leprologia, 1/4, 53-75, 10 figs. and 6 graphs, 25 refs. English Summary.

Normal rats give a negative lepromin reaction. The present 3 experiments were to test the effect on the lepromin

reaction of previous inoculation with BCG or *Myco. lepraemurium*. In the first lots of rats, in addition to uninjected controls, 90 were injected 0.1 ml. of *Myco. leprae* suspension, 20 with a larger and 20 with a smaller amount of a triturated suspension of a murine leprosy lesion. The second lots of rats were first inoculated intraperitoneally with BCG and then 33 days later they were injected intradermally with mycobacteria killed by heat as follows: 30 rats with with 0.1 ml. of a suspension of *Myco. leprae*, 20 rats with a larger and 20 with a smaller quantity of titurated lesion of *Myco. lepraemurium*. The third experiment was very similar to the second, except that in place of BCG living *Myco. lepraemurium* were injected intraperitoneally 10 days before BCG giving the intradermal injections. It was found that in the rats previously inoculated intraperitoneally with BCG or with *Myco. lepraemurium*, the macroscopic lesion was larger and remained longer, while the histological lesions were more intense and showed necrosis. But the cytological appearances were not different from those in the controls.

Mitsuda's Reactions induced in the Normal Rhesus ("Macacca mulata"), by **M. J. Pereira, Jr., and F. Nery-Guimaraes.** Mem. Inst., Oswaldo Cruz., 1955, June-Sept.-Dec., Vol. 53, Nos. 2, 3, 4, 609-19, 2 figs., 10 refs.

Living BCG vaccine was administered to 12 rhesus monkeys by various routes. Before the vaccination all the monkeys had negative tuberculin and lepromin reactions. In the monkeys which were given the vaccine into the peritoneum and the testicle the Mitsuda reaction was converted to 3 plus after 8 months, and continued so till 12 months. In those vaccinated orally, intradermally, by scarification and by multipuncture the conversion was to only 1 plus. In 5 other monkeys vaccinated orally or intradermally with killed BCG vaccine conversions were slower and less marked. The tuberculin conversions were most marked (3 plus) in the peritoneally and testicularly vaccinated monkeys; in the others the conversions were slower and more transient.

Borderline (Dimorphous) Leprosy maintaining a Polyneuritic Form for Eight Years: A Case Report, **by W. H. Jopling.** Trans. Roy. Soc. Trop. Med. & Hyg., 1956, Sept., Vol. 50, No. 5, 478-80, 2 figs.

A patient with neurological symptoms for 8 years was wrongly diagnosed as suffering from syringomyelia. When in 1954 a diagnosis of leprosy was made he was treated with DDS. After 4 months' treatment there were pains in the limbs and erysipeloid

skin lesions. Previous to this a biopsy of the auricular nerve showed foamy cells between the nerve fibres, but no epithelioid or giant cells; there were large numbers of acid-fast bacilli. Later a biopsy of the skin showed " patches of infiltration by mononuclear cells (histiocytes) and epithelioid cells," a few acid-fast bacilli, but no foam cells or giant cells. A diagnosis of dimorphous or borderline leprosy was made.

The Use of Diluted Lepromin. Results of Intradermal Injection of Carbolized Extract of Normal Skin in Patients suffering from Different Forms of Leprosy, by **H. Floch.** Arch. Inst. Pasteur de la Guyane Francaise et la l'Inini, 1956, May, 6 pp.

The antigen of Mitsuda, used in the lepromin test, is composed of 3 elements: the bacillus, leprous tissue and normal skin. Using the whole antigen, and comparing it with a suspension of normal skin as an antigen, the author found that (by the late reading) in tuberculoid cases 90 per cent were positive to the former, and 54 per cent to the latter. In lepromatous cases the early reading was positive in 25 per cent with the skin antigen, and 17 per cent with the whole antigen; but in both of these the late reading was negative.

The Campaign against Leprosy in the Belgian Congo in 1955, by **M. Kivits.** Bull. d' Information sur la Lèpre, No. 3. [Reprinted from Acad. Roy. des. Sci. Coloniales, Classe des Sci. Naturelles et Méd. Mémoires in-8, 1956, Vol. 4, 61 pp., 20 figs. on 10 pls. (55 refs.).]

Leprosy was at first neglected in the Belgian Congo because of the absence of effective methods of treatment and because there were other more pressing medical problems. But in 1926 the Congo Red Cross began work with a centre at Pawa. This was supplemented in 1936 by the formation of the *Fondation Père Damien* for the fight against leprosy. Later *Foperda* (*le Fonds du Bien-Etre Indigène*) and *Forami* made it possible to augment the number of treatment centres. The work is co-ordinated by a provincial committee under the Governor in each province. The principle is to treat all non-infectious patients at out-patient clinics, and the more infectious lepromatous patients in leprosaria. It was calculated in 1949 that there were about 215,000 leprous patients in the Congo, of whom about 90,000 were under treatment. This makes a rate of about 2 per cent, but in the equatorial forest belt the percentage goes up to as much as 4 or 5 per cent. During the year 1955 about 184,686 patients, or about 86 per cent of the whole were under

ambulatory treatment with DDS at urban polyclinics, rural dispensaries and temporary injection centres. DDS is generally given by injection of a slowly absorbed suspension (suspension-retard) once in 15 days.

A list of leprosaria is given, for which special financial provision is made: 7 are Government, 1 *Forami*, 1 Red Cross, 6 Catholic Missions, and 5 Protestant Missions, a total of 20 in all. Five of these are still in course of construction. In those in use there are about 13,820 patients. The question of BCG vaccination and its possible raising of resistance to leprosy especially among children is being examined. [This report is worthy of careful study in the original.]

***Trop. Dis. Bulletin,** Vol. 54, No. 2, February 1957

Allergy to Tuberculin and Lepromin and BCG Vaccination in those with Leprosy, by **L. Chambon and P. Destombes.** Bull. Soc. Path. Exot., 1956, May-June, Vol. 49, No. 3, 414-18.

After testing the reactions of 492 untreated leprosy patients for their reactions to tuberculin and lepromin (189 being lepromatous, 162 tuberculoid, 46 reacting tuberculoid and 95 undifferentiated), the authors come to the conclusion that leprosy does not seem to affect the incidence of allergy to tuberculin because positive reactions to the Mantoux test are practically the same in leprous subjects as in those without leprosy. Both reactions were positive in about one-third of those with leprosy, most of them being tuberculoid cases. In contrast, three-quarters of those allergic to tuberculin but not to lepromin were of the lepromatous type. It appeared therefore in the conditions of the experiment that allergy to tuberculin is not always sufficient to cause the appearance of allergy to lepromin. After vaccination with BCG, conversions to a positive lepromin reaction are always more frequent among those originally allergic to tuberculin.

An Attempt to Control Leprosy by BCG in the Loyalty Islands, by **Medecin-Capitaine Lacour.**

The following is a brief abstract of the summary and conclusions:

An attempt to control leprosy through the use of BCG vaccine has been initiated in the Loyalty Islands during 1954. These islands were selected because of the many favourable conditions

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obtaining there, namely, the stability and homogeneity of the population; an accurate knowledge of leprosy; the detailed records of annual case-finding.

Facts pertaining to population and to leprosy are shown in tabulated form and from the detailed background necessary at the beginning of the campaign. Working procedures are here briefly summarised: Mantoux test: intradermal injection of 1/40 c.c. of a 1/100 dilution of old tuberculin; Mitsuda test: classical test using an antigen diluted 1/30; BCG vaccination: dry frozen BCG vaccine given through skin scarifications.

The early results show, for the different districts and islands, and for age of inhabitants: Tuberculin and lepromin indices, the different combinations of the results and their respective values, the percentages of vaccinated persons for whom the Mitsuda test was negative; the intensity of reactions to the lepromin and tuberculin; and the nature of reaction to the lepromin tests on contagious and non-contagious lepers. It is not yet possible to formulate any opinion on the value of BCG vaccination in the control of leprosy. Only a long period of observation will provide a precise criterion for this evaluation.

During the next years an attempt will be made to control and maintain the tuberculin allergy on the persons under observation; study the variations of the Mitsuda reaction; test the persons that have not been seen in 1954, and the newly-born; study carefully all new cases of leprosy through clinical, immunological, and bacteriological procedures. Only the comparison of the results to be obtained in the future with the results reported here, will make it possible, after several years have elapsed, to formulate an opinion on the value of the BCG vaccination as a measure of control of Hansen's disease on a given collectivity.