ABSTRACTS

Leprosy Control Regulations, Spain. Internat. Digest of Health Legislation, WHO, **10,** 2; 1959, pp. 392–397.

Regulations for control of leprosy, venereal diseases, and dermatoses were issued in *Boletin Oficial del Estado*, 14th July, 1958, No. 167, pp. 1258–1260. In the general organization the three component sections are under the authority of one director. All measures for the treatment of leprosy which are discriminatory are abolished. Compulsory hospitalisation for lepromatous cases is kept for exceptional cases. Most reliance is placed on propaganda and persuasion, and there is provision for the carrying on of health propaganda and education. Early and efficient treatment is to be arranged in leprosaria, dermatological dispensaries, and in domiciliary medical care services, and mobile teams. Intensive survey is to be made by means of the periodic examination of house contacts. Collaboration with the Tuberculosis Control Service is enjoined, so as to explore the possibility of vaccinating with BCG all child leprosy contacts under 10 years of age. If this turns out to be impossible, all lepromin-negative contacts should be given small doses of sulphone drugs as a prophylactic. Preventoria are still available, or children born of mothers who are leprosy subjects are boarded out with families, or admitted to hospices. Laboratories are to be given grants to aid them in respect of histopathological work done for the leprosy service. The leprosaria at Trillo, Fontilles, Abana, and Las Palmas are to be the main leprosy hospitals and grants will continue to be given to the San Juan de Dios hospital in Madrid.

Mortalidad Temprana Provocada en el Cricetus Auratus (*Hamster Dorado*) *por las Dietas Pro-oxidantes.* (*Early Mortality Provoked in Cricetus Auratus or Golden Hamster by Pro-oxidant Diets*). MENY BERGEL, La Semana Medica, **114,** 13; Mar. 26, 1959, pp. 391–393.

The author recalls that K. E. Mason of Johns Hopkins in 1953 summarised a great number of experiments which showed that Vitamin E played a very important part during the early life of animals. It has also been established that fats with a high content of polysaturated fatty acids accentuate and cause the precocious appearance of the symptoms of lack of tocopherols in animals who are receiving diets with a low content of Vitamin E. This anti-Vitamin E stress factor is shared by other substances, e.g., silver nitrate. K. E. Mason and R. E. Rumery have shown that in white rats the administration from birth of a diet low in tocopherols to which has been added 2% of cod liver oil and 18% of pig fat provokes no mortality. If the content of cod liver oil is raised to 10% there is 90% paralysis from muscular dystrophy; and if it is raised to 20% of cod liver oil, there is 100% mortality inside the first month. If this last diet is

given later, at 21 days, it produces a high mortality, but if at 30 days, does not produce an early mortality. With only 10 days of difference the results are fundamentally different: this same diet with low content of Vitamin E and 20% of cod liver oil, with added tocopherols, given to the rats from birth, causes no mortality. So in the rat, the sooner the Vitamin E deficiency is provoked, and the more pro-oxidant the diet, the greater are the disturbances that are produced.

In his present study, the author took 69 Syrian golden hamsters and placed them on five different diets at a variable period of time from their birth, and noted the early mortality in them up to about 60 days. The diets used were of three kinds; a standard complete diet as a control, a diet with low content of Vitamin E and without the addition of pro-oxidant elements; and thirdly, a pro-oxidant ceroidogenic diet with low content of Vitamin E and with fats of high content of unsaturated fatty acids (6, 10 and 20%). All diets had mineral salts added. The results showed clearly that the early mortality in the hamsters increased with the duration and earliness of administration and the content of unsaturated fats in the diet.

A Preliminary Trial of Chloroquine Diphosphate in Lepra Reaction. G. RAMU, J. of Indian Med. Assoc., **33**, 4; Aug. 16, 1959, pp. 127–129.

The author treated eight cases of lepra reaction with chloroquine diphosphate as oral tablets containing 0.25 g., giving one tablet thrice daily for a week and one tablet twice daily for another three weeks. The patients were under treatment with DDS, and two were on DDS plus INH. All the cases showed symptomatic relief in the shape of removal of fever and relief of the inflammatory state of the skin lesions, and of erythema nodosum leprosum, arthritis, and orchitis. On the dosage given there was no sign of toxicity of the drug.

Leprosy in the Americas. Annual Report, 1958, of the Director, Pan American Health Organisation, Washington 6, D.C., pp. 49–51.

The Organisation has done further work to survey the incidence of leprosy. Prevalence rates per 1,000 population were estimated as follows: French Guiana 51.19; Guadaloupe 9.40; Martinique 7.56; Surinam 4.41; British Guiana 2.83; Virgin Is. (U.K.) 2.71; Brazil 1.98; Venezuela 1.72; Paraguay 1.50; Trinidad and Tobago 1.21. These can be considered to have high endemicity. The following are of medium endemicity, that is ranging from 0.87 down to 0.22: Hawaii, Antigua, Colombia, Cuba, Virgin Is. (USA), Argentina, Costa Rica, Mexico, Jamaica, St. Kitts-Nevis-Anguilla, Bolivia, St. Lucia, St. Vincent, and Peru. The remaining 12 countries and eight other areas had low endemicity. There is a wide disparity in the operation of leprosy programmes.

A Seminar was held in Belo Horizonte, Brazil, 30th June to 7th July, 1958, with 42 participants. There were active discussions on leprosy control. The Seminar advocated the abolition of compulsory isolation, and the gradual and complete integration of anti-leprosy activities into the general public health services.

The Bureau continued collaboration with Colombia and Paraguay in their leprosy control programmes.

Bone and Joint Changes in Leprosy. K'UNG CH'ING-TEH and colleagues, Chinese Medical Journal, **79,** 2; Aug. 1959, pp. 130–137.

The authors studied the bone changes in 55 cases of more advanced leprosy of all types. The mechanism of these changes is chiefly neurotrophic, but vascular disturbances, trauma, and infection accelerate the bony absorption. The degree of mutilation depends on the extent of bony absorption which in turn is proportional to the degree of sensory loss, trauma, and infection. Prevention of trauma and infection is an important step in avoiding mutilation of the extremities. The authors give many radiographic and histological plates.

The Value of Acridine Orange and of Electron Microscopy in Determining the Viability of Mycobacterium Leprae Murium. J. A. MCFADZEAN and R. C. VALENTINE, Trans. of the Royal Soc. of Trop. Med. and Hygiene, **53,** 5; Sept. 1959, pp. 414–422.

The authors studied whether the fluorescent dye acridine orange could indicate whether *M. leprae murium* was alive or dead, as living organisms have been said to fluoresce green and dead organisms to fluoresce red when treated with this dye. They prepared suspensions from lepromatous tissue from the rat and applied acridine orange. They found it was not possible to differentiate living and dead organisms by this means. In general the organisms in a fresh suspension fluoresced very faintly. After the suspension was heated in a water bath the organisms did fluoresce red, and this was the only way of obtaining this effect. They also noted that when organisms which were fluorescing red were exposed to blue light, the fluorescent colour changed to green. This was due to a change in the dye itself, possibly a photo-dimerization.

However, electron microscopy seems of more value as it seems possible to distinguish a normal viable and a degenerate non-viable form. The former has an almost uniform electron density. In the latter the bacterial cell was more empty, apart from dense masses of shrunken material. Inoculation of the degenerate type into rats failed to produce lepromata after one year, whereas the other type produced lepromata at four months after inoculation (four illustrative plates given of the appearances of the bacilli in each type).

The Fine Structure of the Lepra Cell. E. M. BRIEGER, Trans. of the Roy. Soc. of Trop. Med. and Hygiene, **53,** 4; July, 1959, pp. 346–348. 7 figs.

Once a leprosy bacillus has been ingested it need not necessarily multiply inside the macrophage and disrupt it, but it may enter into a peculiar relationship with the host cell resulting in the final disintegration of both the bacillus and the cytoplasm of the host cell. The term lepra cell should be reserved for this type of cell-parasite relationship, which causes typical foamy cytoplasm due to lipoid degeneration and vacuolization, degeneration of the nucleus, and the bacilli lose their shape and definition and clump together. Brieger has compared this classic picture with electron micrograms of thin sections of similar material. Material was obtained from the Oicha Leprosarium in the Belgian Congo through the co-operation of Dr. C. Becker. Lepromatous material was used from seven chronic cases who had not yet shown response to treatment and four untreated cases. Dr. Becker removed pieces of lepromatous tissue, which were then cut into small cubes. Some were fixed in Susa solution for paraffin sectioning and others in 2% osmic acid for thin sectioning: all were transferred to 75% alcohol after washing in buffer solution, for transport to Cambridge. There the osmic acid fixed material was embedded in n-butyl methacrylate and sections were cut on a Porter-Blum microtome. When a thin section through one of the nodules is examined under the electron microscope at low magnification, the whole field is seen to be occupied by the remains of cells in which the nuclei are quite well preserved, but the cytoplasm has been largely replaced by osmiophilic vacuolized structures which contain degenerated bacilli or fragments. It is difficult to say whether any of these fragments or inclusions are viable. Where the sections came from an untreated case, the bacilli appeared in cigar shaped bundles in longitudinal and transverse section. The nuclei or the containing cells are swollen and appear as vesicles, and are very different from the nuclei of the lepra cells; there are no osmiophilic deposits such as in the lepra cells. These two types of intracellular development described may well be two extremes of cell response. It seems that the presence of osmiophilic inclusions distinguishes the lepra cell from other cell types.

Modern Approach to Leprosy Control. R. V. WARDEKAR, Journ. of the J.J. Group of Hospitals and Grant Medical College, Bombay, **4,** 3; July, 1959, pp. 153–159.

Dr. R. V. Wardekar of the Gandhi Memorial Leprosy Foundation, Sevagram, Wardha, India, reminds us that leprosy is a communicable disease but the logical method of segregation of all infectious cases is impracticable because it comes up against prejudice against the disease and its victims, and the great size of the leprosy problem. So long as society and the medical profession do not

change their attitude towards leprosy, unrecognised patients will continue to move about in society, Dr. Wardekar states that in India, on the basis of sample surveys, he estimates the existence of 2,000,000 leprosy cases in the country. The past 80 years of leprosy work in India provided institutional care for only 20,000 patients, but even this costs £600,000 per annum. Probably only about 5% of the cases are being isolated in leprosaria and only about 10% of the total patients are being treated in out-patient departments. With the coming of the sulphones he decided to try them for five years in a selected village near Wardha. Kate Seloo was chosen, a village of 1,500 population and about 20 per thousand incidence of leprosy. By repeated surveys and the treatment of all cases with the sulphones it was hoped to control the disease. Later the Gandhi Memorial Leprosy Foundation made it possible to extend the experiment more widely. There was much success, and a population of 200,000 was covered. It was found that repeated surveys promoted early detection of cases, that early treatment prevents deformities, that in the early cases of leprosy all marks of the disease disappeared, and that there was a definite decline in infectivity of lepromatous cases. Thus in four to six years, 77% became non-infectious; in two to four years, 48.2%; in one to two years, 21.1%. The success of this work has inspired an expansion of the idea over Bombay State. There will be a central state organization which will plan, guide, and organize the work but treatment will be decentralized, so that there will be hundreds of diagnosis and treatment centres. Existing leprosaria will be retained as hospitals.

Leprosy in School Children in a District Town of West Bengal. S. C. SEN and D. K. MULLICK, Leprosy in India, **30,** 4; Oct. 1958, pp. 175–177.

The Bankura rural villages were known to have a high incidence of 49.5 per thousand, but the town itself had not been surveyed, so the students of seven schools in the town were examined. In 2,329 students 50 cases of leprosy were found, an incidence of 26 per thousand. In children below the age of 15 years the share of the incidence was 86%. Most cases found were non-lepromatous. In addition to the diagnosed cases 70 (3%) of the students had suspicious signs of leprosy such as hypopigmented skin macules and nerve thickenings. The author reflects that examination of school children and students should be a regular feature of leprosy campaigns, and that one should not be complacent about the apparent benign nature of the cases found, for they are early, and experience in the same area shows that 41 cases of lepromatous leprosy had begun in this mild manner in children under 15 years.

Lepromatosis Difusa. F. LATAPÍ, Minerva Dermatologica, **34,** 4; April, 1959, pp. 272–278.

Dr. F. Latapí of Mexico reviews the literature and opinions on

diffuse lepromatosis, with 18 illustrations. It was described in Mexico by Lucio and Alvarado in 1852 as a special clinical form of diffuse lepromatous leprosy. The Lucio phenomenon is the individual cutaneous lesion of the lepra reaction in diffuse lepromatous leprosy, and the diffuse form expresses the highest of the degrees of resistance by the body to the leprosy infection. The anatomical substratum of the Lucio phenomenon is a necrosing angiitis which seems to be determined by a microbial synergy of the Sanarelli-Schwartzman type. The Lucio phenomenon deserves deeper and wider study in its connection with the immunology of leprosy and in relation to other types of multiple angiitis which are met with in the most diverse forms of disease.

O Simposio Sobre BCG na Lepra de 1957 *através da Análise Estatistica.* (*Symposium on BCG in Leprosy since* 1957 *using Statistical Analysis*). M. X. DE ARAUJO, Boletim do Serviço Nacional de Lepra, **18,** 1; March, 1959, Rio de Janeiro, pp. 5–23.

Professor M. X. de Araujo was designated to give the statistical analysis of the papers read and discussed in a symposium on the bases of the use of BCG in the prevention of leprosy, promoted by the Brazilian Association of Leprology. After citing the findings of the many authors he makes interesting concluding remarks: A definite answer to the problem has not yet been given. Investigators all over the world use apparently similar methods and arrive at contradictory conclusions. This is because they do not have enough objectivity in defining the statistical unities. Secondly, the results differ because the populations investigated differ. In the third place, many investigators do not indicate clearly how they constitute their experimental samples. In human populations it is extremely difficult to obtain sufficiently numerous equivalent groups. Not only is this equivalence extremely important, but there should be a wide representation of types in each group, with the variations parallel in each group. It is worthwhile noting also that results, even when not significant from the statistical point of view, do not make the experiment useless. At least they can be used as a pointer to the existence of some definite factor, and to further work. If numerous isolated experiments show concordant results this factor must be given thought, even though each of the isolated results has not been significant nor can all the results from the different experiments be suitable for adding together. Supposing there has not been "selection" in the investigations there remains an impression from the results presented in this symposium that there is a certain "convergence of testimony" in certain unknown factors, such as the chance of the conversion of the Mitsuda by various artificial stimuli, as lepromin and BCG, alongside the existence of persistently negative subjects who are quite unable to react positively. Also there seems

to be a strong indication that conversion implies an effective increase of resistance to the leprosy infection. These matters suggest that we return for more experiments in animals. In humans we should arrange and balance carefully our experiments on the lines suggested. The natural factor of reactivity (the "N" factor of Rotberg) is worth studying in humans, as it may be one of the keys to the prophylaxis of leprosy. Finally study should be made of the papers and debates in the *Revista Brasileira de Leprologia*, **25**, 4; Oct.–Dec., 1957.

Reação Leprótica e Hormonios Corticosteroides: Algumas Informações Fornecidas pelo Laboratório. (*Leprotic Reaction and Corticosteroids: some Laboratory Findings.*) CANDIDO SILVA and MILAN TUMA, Boletim do Serviço Nacional de Lepra, **18**, 1; March, 1959, pp. 24–32.

These authors carried out the Thorn Test in a lepromatous patient who had never had attacks of lepra reaction, and in another who had periodic typical grave reactional phenomena. The test consisted of the intramuscular injection of 25 units of ACTH twice daily for four days, morning and evening eosinophil counts, and the estimation of 17-ketosteroids and corticoids in the urine. The data were compared with those obtained in the patients one week previously, when they had not been given hormones. Both the lepromatous cases reacted in a similar way to the Thorn Test, similarly to normal persons.

Next was studied the urinary elimination of 17-ketosteroids and corticoids in a lepromatous case subject to grave periodic attacks of lepra reaction. A slow and progressive fall was noted in 17-ketosteroids during the course of the lepra reaction and an increase during convalescence. In the corticoids there was a mild oscillation in values during the whole observation. Even when the levels fell most, these were not below the normal lowest limits. The authors think that these problems of auto-antibodies should be transferred from endocrinology to immunology. We should exclude the idea of the participation of the suprarenal hormones in these acute phenomena. The fact that the lepra reaction improves on administration of the glucocorticoids is not a definite proof, given the collateral effects produced by these hormones. They have effects in all infectious or allergic syndromes, and it has not been proved that they have a primary relation in lepra reactions. The relation of the collagenoses is also interesting, and the concepts about these are already changing. Some authors think that they are intimately bound up with hormones of the suprarenal cortex, in the sense of an anomalous hormonal response to body stress. There are now other theories, for example that in rheumatoid arthritis antibodies exist against the gamma globulin of the body itself (auto-antibodies) and the LE phenomenon of lupus erythematosus is produced as

a result of a reaction between the antibodies, and desoxyribonucleic acid of the leucocytes. The authors will continue investigations according to these new perspectives.

Bioelectricheskaya Aktivnosty i Reaktivnosty Kory Bolishikh Polusharii u Bolinikh Leproy. (*Bioelectric Activity and Reactivity of the Cerebral Cortex in Leprosy Patients.*) A. N. GORDIENDO, N. A. TORSUEV, A. V. LETIEN, B. A. SAAKOF, J. AJIPA, and R. B. TSINKALOVSY, Sbornik Nauchnikh Rabot po Leprologii i Dermatologii (Collected Papers on Leprology and Dermatology), No. 12, 1959, pp. 3–16, Rostov-on-Don Experimental and Clinical Leprosarium, U.S.S.R.

The authors investigated the bioelectric activity by means of the electro-encephalograph in 17 lepromatous and 10 tuberculoid patients, and found the more marked changes in the lepromatous cases in the frontal lobes of the cerebral hemispheres. In certain cases there was a slow deviation of the potentials which corresponds to the predominence of the processes of inhibition. More rarely one sees rapid oscillations of the peak type which indicate a more intense process of irritation. There is a change in the co-ordination of activity in the two frontal lobes. In the posterior region of the cortex the alpha rhythm is irregular and unstable and the co-ordination is imperfect but not as much as in the frontal lobes. The level of reactivity and especially of excitability is lowered, which shows a predominance of the processes of inhibition. In tuberculoid leprosy the changes in the central nervous system are similar but less intense. Clinical cure does not include the disappearance of these manifestations in the nervous system.

O Topograficheskom Raspredelenii Vozbuditelya Lepri v Nepovresyldennoy Kosye Bolinikh. (*The Distribution of* M. Leprae *in the Apparently Healthy Skin of Leprosy Patients.*) A. A. STEIN, Collected Papers on Leprology and Dermatology, No. 12, 1959, pp. 54–58, Rostov-on-Don.

The author examined material obtained by scarification of the clinically normal skin of leprosy patients and discovered leprosy bacilli in the fold of the elbow, in the groin folds, armpits, and anal regions. Quite often bacilli are found in the skin of the fingers and of the face.

Novii Sposob Vichisleniya Bakterioskopicheskogo Indeksa Pri Lepre. (*A New Method of Calculating the Bacterioscopic Index in Leprosy.*) M. E. ORLOVA, Collected Papers on Leprology and Dermatology, No. 12, 1959, pp. 59–63, Rostov-on-Don.

The author recommends use of the method of Dharmendra for determining the bacterial index, but also taking into account the atypical bacillary forms. Thus the index is expressed as a fraction of which the upper figure is that of normal forms and the lower represents the degenerated forms. This gives a better picture of the

bacteriological evolution especially under treatment. The upper figure declines little by little to zero, and the lower, which is often nil at the beginning, first rises and then declines progressively and reaches zero a little later than the upper figure.

Results of the Census of Leprosy and its Ambulatory Treatment in the Banalia Sector of Belgian Congo. G. VAN DER MEULEN and G. MELEN, Ann. Soc. Belge Med. Trop., **37,** 1957, pp. 115–122.

In Banalia the rate is 66 per thousand of the population, and of the 3,083 cases registered, 16.2% were lepromatous, 82% tuberculoid, and 1.8% indeterminate. The mass treatment is based on DDS tablets and DADPS injections. After two years there have been 21.7% of "cures" in the tuberculoid, 5.5% in the lepromatous, 4.16% in the indeterminate. For cases with less than two years of treatment, there were 13.71% of "cures" in the tuberculoid, and 4.51% in the lepromatous. The clinical amelioration in general is 60 to 70% after two years of treatment, and the results are even better in those who took regular treatment for three years.

A Histochemical Study of Some of the Hydrolytic Enzymes in Leprosy. W. J. PEPLER, E. LOUBSER, and R. KOOIJ, Dermatologica, **117,** 6; 1958, pp. 468–477, 7 figs.

The material was taken from seven cases of lepromatous leprosy and from nine of tuberculoid, and examined by methods of Pearse and of Baker for acid and alkaline phosphatase, non-specific esterase, sulphatase, and lipoids. Non-specific esterase was demonstrated in epithelioid, giant, and lepra cells. Alkaline phosphatase was present only in the capillary walls. Acid phosphatase occurred more strongly in the lepra cells than in the epithelioid and giant cells and the authors think that this enzyme might play some part in the metabolism of the lipoids of *M. leprae*. Sulphatase was shown to occur in the lepromatous and tuberculoid infiltrates.

Histopathology of the Reaction Papules Evoked by Intradermal Injection of Normal Tissue Suspensions and Kveim Antigen. R. KOOIJ, W. J. PEPLER, and J. WAINWRIGHT, Dermatologica, **119,** 2; 1959, pp. 105–114, 3 figs.

Normal skin suspension was made according to the Wade-Mitsuda method by extraction with saline. Normal liver suspension were prepared by extraction with chloroform and treatment with ether (Dharmendra method) and concentrated. Kveim antigen KJ was provided by Dr. James of London and Kveim antigen K by Dr. Kuper of London. The preparations were injected intradermally in doses of 0.1 to 0.2 ml. in leprosy patients with various forms of the disease, and the reaction papules were excised at different intervals and examined histologically. A saline suspension of the liver of a sarcoidosis patient was injected in four control patients. It was found that suspensions of normal skin and of liver can evoke structures which are histologically sarcoid, when injected into the

skin of patients with tuberculoid leprosy and in normal controls, these sarcoid structures being similar to those obtained with Kveim antigen, and being found most often one month to six weeks after the injection. The authors bring forward evidence for accepting the existence of different stages of the sarcoid granuloma. They conclude from their findings that the Kveim antigen does not contain a specific substance for sarcoidosis. It is not a specific test, though probably sarcoidosis subjects react more strongly to the Kveim antigen.