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# Reports

## VI Conference of the Indian Association of Leprologists IX All India Leprosy Workers' Conference. Madras, 27th - 31st January, 1965

(DR R. J. W. REES has kindly contributed this personal description of the Conferenecs. He was present at them).

'As Chairman of LEPRA Medical Committee I have recently had the pleasure of attending these two meetings in Madras. At these conferences Dr Dharmendra was President of the Indian Association of Leprologists and Dr R. G. Cochrane President of the All India Leprosy Workers (a particularly nice appreciation of their respect for his achievements in the field of leprosy in India). These two Associations must be congratulated in their far-sighted policy of running the conferences consecutively in order that they can both be attended by all medical and para-medical personnel working in the fields of leprosy. International medical and non-medical representatives from Denmark, Japan, Nigeria, Pakistan, Philippines and United Kingdom were present. The United Kingdom was represented by Dr R. G. Cochrane as President of the All India Leprosy Workers and in addition to myself Air Vice-Marshal Crisham, General Secretary of LEPRA, not only attended the conference but toured a large number of the many leprosy units in the State of Madras receiving financial assistance from LEPRA.'

A general review of the papers presented will be reported in *Leprosy Review*. I will confine my remarks to my general impressions of the conferences. Both conferences were efficiently run with adequate time for discussion. The highlights of the medical and scientific meetings included genetics, plantar ulcers and corrective surgery, chemotherapy of leprosy and experimental transmission and metabolic studies on *M. leprae*. In particular the genetic studies undertaken by Dr Mohamed Ali at the Central Leprosy Research Institute, Chingleput, the very special contribution of India in the field of corrective surgery following in the footsteps of Mr Paul Brand and the highly suggestive evidence initiating from India that lower doses of dapsone are not only as effective as higher doses but they are associated with a significantly lower incidence of reaction. These latter findings were supported by Dr Stanley Browne of Nigeria. Results presented indicated that doses as low as 50-100 mg. dapsone twice a week were as effective as standard treatment of 600 mg. per week. Such findings indicate the necessity for a complete reappraisal of dapsone therapy and strongly suggest that the very practical application of intermittent treatment of leprosy with once weekly or perhaps even once fortnightly dapsone may yet be achieved.

The All Indian Leprosy Workers' Conference left a very real feeling of the dynamic and practical methods which were being applied both by the Government and voluntary services to deal with the present estimate of 3.5 million cases of leprosy in India who were particularly concentrated in the Eastern Districts. Dr Koshoo on behalf of the Central Government presented a fair assessment of the achievements gained during the III Plan and those envisaged in the IV Plan to deal with the tremendous problem facing a country with very restricted financial means. Dr Wardekar presented a very fair assessment of the special contributions which voluntary organisations can make to the leprosy problem in India. Because the total leprosy problem in India was so large it could only be tackled by funds from the Government. Nevertheless, voluntary organisations could still play an essential part on a qualitative basis by concentrating their efforts on specialised or pilot projects.'

**Sixth Conference of the Indian Association of Leprologists.** Summary of Papers derived from the detailed official programme.

(**1**) *Course of Erythema Nodosum Leprosum* by J. G. TOLENTINO, M.D., was the result of a study of 103 newly admitted lepromatous patients over 56 weeks. About 73.8 per cent had ENL at one time or other, and 22.0 per cent had it more or less continuously. The ENL lesions were papules, nodules or larger lesions than normal, and accompanied by constitutional symptoms in about 70 per cent of patients.

There are indications that anti-leprosy therapy needs to be continued in patients suffering from ENL, rather than suspended.

(**2**) *Exacerbated Lesions in Leprosy:* C. K. JOB, B.SC., M.D., delivered a paper based on a study of exacerbated lesions in leprosy over a period of three years. He found that exacerbation manifests itself in different ways in different forms of leprosy. In the indeterminate group exacerbation shows as progression to other forms of the disease, so may be said not to occur in stable indeterminate leprosy but in the unstable. In the tuberculoid group exacerbation may be localized to a dermal area or a nerve trunk or generalized in the whole area of the skin and widely in nerves. There is evidence of a blood spread of the disease causing metastatic lesions. In the borderline group the exacerbation follows the same pattern as in the tuberculoid group but in much worse form. In the lepromatous group the acute exacerbation is always generalized. The more common is in the form of ENL which is specific to the lepromatous type, but there is also the exacerbated lepromatous granuloma.

(**3**) *The Theory of Suprarenal Cortex Damage in Leprosy and its Role in Leprosy Including the Exacerbations* was a paper given by DR D. CHAKRABARTHY and points out the difficulty of a single theory explaining all the phenomena of exacerbation. After discussing the basic disturbance of endocrines and chronic inflammation, the author advances the important theory of damage of the suprarenal cortex. Such damage will cause deficient secretion of the gluco-corticosteroids. This theory has been previously adduced to explain some of the exacerbation phenomena caused by potassium iodide. A plea is made for further investigation.

(**4**) *Study of Reaction in Tuberculoid Leprosy* by DR S. CHOUDHURY, M.B.B.S. and DR S. GHOSH, M.B., D.T.M. The authors mention the unsatisfactory state of the nomenclature of reaction and mention their findings in 218 leprosy patients of tuberculoid reaction, of whom 46 patients were intimately observed. There was a sudden appearance of new thick erythematous lesions, as well as activation of existing lesions. Most patients were bacteriologically positive and became negative within a short period, and in most patients under review the lepromin test was positive. There was no detectable pattern in results from blood cholestorol, albumen, and globulins.

(**5**) *Certain Pathological Features of Reaction in Lepromatous Leprosy* by C. G. S. IYER and SRI P. B. NATH. The authors studied the histological findings in 40 patients with reactions in lepromatous leprosy. The dominant feature was inflammation of an acute or subacute nature in a background of pre-existent regressive lepromatous exudates. It was noted that subcutaneous nodulation formed from fibrous tissue which enmeshed a previous inflammatory exudate. In a few cases, subcutaneous nodulation resulted from lymph nodes, nerves, or skeletal muscle previously involved.

(**6**) *Blood Chemistry in Acute Exacerbations in Leprosy* by S. BALAKRISHNAN. This paper presents data from biochemical investigations on the blood serum during exacerbation and subsided phases, with normal controls. The data chiefly referred to are protein and lipid patterns, as the deviation from normal was significant in these. There was a constant lowering of albumin and increase of globulin, irrespective of the phase, whether reactive or subsided. Moderate globulin increase was also noted in patients with acute reaction, and a general lowering of cholesterol levels was noted. Preliminary studies in serum sialic acid, a constituent of mucoprotein, showed a raised level in leprosy sera, particularly in reactive states.

(**7**) *The Significance of the Genetic Approach to Leprosy* by R. G. COCHRANE, M.D., F.R.C.P. The author mentions the genetic factors in leprosy and requests serious attention to the genetic factors. This is likely to explain several anomalies which are urgent and open up a wide further field.

(**8**) *Genetic Influence in Leprosy* by P. MOHAMED ALI. This paper presents findings of several studies in the Research Institute, Chingleput. Infectiousness alone cannot explain everything, for it was noted that the incidence of leprosy has no relation to sanitation, housing conditions, economic status of the family, educational status of the patients and family, nor to nutrition. It was found that there was no correlation between number of patients and the size of the family. No age group is particularly vulnerable to leprosy, nor is age a bar to incidence of the disease. There was no basis for the ideas of adult insusceptibility and the necessity of prolonged intimate contact. Monozygotic twins have a much greater concordant susceptibility to the incidence of leprosy than dizygotic twins.

The author explains the various anomalies in the epidemiology of leprosy more readily on a hypothesis that susceptibility to leprosy is genetically determined and cites facts which support the genetic theory, namely (a) the significant sex ratio, particularly on lepromatous leprosy, (b) the finding of two decisive periods when infection is apt to occur, (c) the greater concordance among monozygotic twin pairs, (d) the disease tends to cling to families, (e) there is a racial predilection for certain types of leprosy.

The distribution of leprosy in India and the high level in Madras State may also be explained on a genetic basis, but the author does not think there is a single irregularly dominant gene. He thinks the genetic influence may be multi-factorial.

(**9**) *Study of Genetic Inheritance in Relation to Leprosy and Environmental Factors* by V. K. SHARMA. The author discusses the role of genetics in his paper and points out the multitude of factors. The author's studies in Uttar Pradesh indicated the possible social factors. Much work in sectors other than genetics has to be done, though genetics is undoubtedly important.

(**10**) *Determining Factors in Localization of Foot Ulcers* by H. SRINIVASAN. The author points out that a knowledge of such factors should be most helpful in prevention and therapy. He discusses these factors in normal feet with normal usage, and abnormal feet, and emphasizes that each patient and each foot should be considered in detail so that harmful factors can be recognized.

(**11**) *Plastic Aspects of Scars on the Anaesthetic Foot* by W. M. LENNOX. From ulcers which may recur where ulceration has destroyed the special subcutaneous pulp, scars may break down as a result of pressure and crushing of cells and shear and rupturing of cells. Sites which are prone to reulceration are scars over recognized pressure points, scars over pressure points in distorted feet, and heel scars. Recommended methods of treatment are physiotherapeutic in massage and ultrasonics, and surgical such as splint

skin grafts, local flaps, direct flaps, pulp flaps, early correction of claw toes, trimming of underlying bone. Orthopaedic deformity should be corrected first. If the foot ulcerates in spite of protective footwear, then plastic surgery should be considered.

(**12**) *Patterns of Disintegration of the Tarsus in the Anaesthetic Foot* by J. HARRIS and P. W. BRAND. The authors distinguish tarsal disintegration from distal absorption of the foot. Tarsal disintegration follows certain definite patterns. Mechanical stress determines the pattern. The path of the stream of weight is the core of this. The basic requirements for the development of the patterns are loss of pain sensation and loss of vigorous activity, and other important factors are sepsis, muscular paralysis, and trauma.

It is not invariable, but plantar ulceration usually precedes tarsal disintegration; plantar ulceration is an invariable accompaniment at the stage of the end result. Early diagnosis and prevention are important in management. Conservative treatment includes complete bed rest and provision of special footwear, immobilisation in plaster cast and special surgery.

(**13**) *Dressing Room Surgery for Complicated Ulcers of Leprosy Patients* by S. L. GUDE, M.B., B.S. The author reports the study at Kothara Leprosy Hospital during 1962 and 1963 of 349 leprosy patients treated for ulcers on anaesthetic limbs. He found that 179 patients had repeated admissions and 243 had ulcers with complications from sepsis and needed surgical treatment. They were treated in 552 dressing room operations. These were excision of nails, trimming of bones, sequestrectomies, curetting, amputations of digits, incisions to drain abscesses, debridements, and saucerizations for osteomyelitis. There was a 'no touch technique' and teams of workers organized to bring and remove patients, to make records, to pass the sterile instruments to the surgeon, to clean and sterilize the used instruments at once, and to dress and bandage the wounds.

This method deals effectively with a large number of patients in a short time with few skilled personnel, and keeps the main threatre free of sepsis, and ever ready for action. Artificial anaesthesia is seldom needed because usually these ulcers are on anaesthetic limbs. When needed, two per cent procaine is used by digital block or local infiltration.

(**14**) *Plantar Ulcer and its Management* by S. HASSAN. The author first discusses definition and theories of plantar ulcer. The main accepted facts are that plantar ulcer occurs on the anaesthetic sole of the foot, appears on the walking foot, develops on an area bearing pressure, underlies the bony prominence. Superficial and deep ulcers are the two main types. The first part of treatment is education of the patient in the care of anaesthetic hands and feet. Management of the pre-ulcerative stage is allied to management of the ulcer and of the healed ulcer. In the pre-ulcerative stage rigid rocker shoes should be used. For ulceration a walking plaster cast may be applied below knee, or bed rest given on a posterior slab. Dressing alone cannot heal a plantar ulcer, but local use of an antileprosy drug promises some success. Soft-soled footwear is used for healed ulcers and the scar made mobile by oil massage.

(**15**) *Low-dose Oral Dapsone Therapy in Bacilliferous Leprosy* by S. G. BROWNE. While the maximum tolerated weekly dosage of dapsone is not difficult to determine, much uncertainty still exists regarding the lowest therapeutically active dose. Lowe (1951) expressed the opinion that 'years of experience will be needed before the most effective dose can be determined', and thought that in Indian patients the dosage of dapsone might have to be reduced 'even below 100 mg. daily'.

A group of African adults suffering from severe lepromatous leprosy have been studied for from three to four years while they have been treated with 50 to 100 mg. of dapsone by the mouth twice weekly.

Regular frequent bacteriological examination has been performed, and both the bacterial Index and Morphological Index (the percentage of normal staining solid rods) have been determined.

Results to date indicate a rapidity of a clinical and bacteriological improvement in all respects comparable with that noted on much higher dose regimes of dapsone.

In addition, the incidence of complications has been substantially reduced in number and severity. Anaemia did not occur. The reactions were fewer and of short duration, and less serious than those occuring in similar groups on standard treatment regimes. No instance of allergic dermatitis occurred. There was a lower incidence of polyneuritis.

Further studies are in progress.

(**16**) *Isonicotinyl Hydrazone of 2-Carboxy-Methoxy-Benzaldehyde (Compound 377) in the Treatment of Human Leprosy* by S. GHOSH. It has been reported that Compound 377 has been very effective in suppressing infection in experimental rat leprosy, so the author undertook a clinical trial in human leprosy on 167 patients on a dosage of 200 mgm. orally daily for 18 to 22 months. There were a further 30 patients studied for comparative treatment on dapsone. He found marked improvement in 20 lepromatous patients, moderate improvement in 20, slight in 30, and 10 cases became bacteriologically negative during the period. Of the 97 tuberculoid patients complete arrest of the disease was noted in 11, marked improvement in 19, moderate improvement in 21, slight in 39. No reaction was observed, and histology at intervals revealed regression.

In comparison with the control group, this drug produced chemical and bacteriological improvement within a shorter period.

(**17**) *A New Approach to Anti-leprosy Therapy* by D. CHAKRABARTHY. The new approach is attention to inflammatory or anti-inflammatory as well as bacteriostatic properties of the drug. The author classifies known drugs as follows: drugs with bacteriostatic and inflammatory properties are sulphones, INH, thiosemicarbasone, streptomycin, thiambutosine. The drugs with bacteriostatic and anti-inflammatory properties are amodiaquine and chloramphenicol. Drugs with no bacteriostatic but possessing anti inflammatory are aspirin, salicylates, antimony, glucocorticosteroids, ACTH, calcium and anti-histaminics. The author makes a plea for further research on amodiaquine and chloramphenicol.

(**18**) *Treatment of the Residual Patches of Leprosy* by A. T. ROY The stigma attached to the disease much hampers treatment and rehabilitation. Patients with diffuse lepromatous

leprosy may move among contacts undetected and spread the infection, but the least mutilation and scar arouses alarm, quite often unjustified. It is worth while attending to these surgically, and even residual pigmentation can be treated successfully with intradermal Ludocreol.

(**19**) *An Injectable Diphenyl-thiourea Compound in the Treatment of Leprosy* by RUTH PFAU and ZARINA FAZALBHOY. Since 1963 the authors have conducted a controlled clinical trial with injectable Ciba-1906. There were 40 patients on the drug and 40 control patients who received the standard drugs. The dosage of Ciba 1906 began on 100 mgm. and the dose gradually built up to 2 gm. weekly. Tolerance was good and reactions less severe and less frequent. Improvement in the disease was generally good, and the results comparable to those from DDS. The injections were difficult to administer, and five patients developed sterile abscesses at the site of injection. It is a valuable alternative drug, particularly where standard drugs are not tolerated.

(**20**) *Lower Dosage Sulphone Regimen in the Treatment of Lepromatous Leprosy* by G. RAMU and K. RAMANUJAM. The authors studied this in 135 patients over 18 months, with different dosage schedule in groups of cases. They found that the results so far in the smaller dose group are as good as those on the larger dose, and the incidence and frequency of lepra reactions are difinitely lower in the group on the smallest dose, namely 200 mgm. weekly for adults and 100 mgm. weekly in children. The smallest therapeutically effective dose should now be sought.

(**21**) *Observation on Borderline Leprosy* by S. KUNDU, S. GHOSH, and P. C. SEN GUPTA. The authors have studied biopsies of 30 active untreated borderline leprosy patients. In histology the normal epidermal contour was lost and rete pegs were shortened and flattened in most specimens. In over half, a clear more or less continuous epidermal space was noted. The proportion of dermal granuloma was massive to moderate, either focal and compact or confluent in the papillary part. Infiltrating cells of lepromatous tissue changes were common, or Langhan's giant cells in tuberculoid foci were found in various parts of the granuloma. Some of the nerve fibres showed peri-epineural and endoneural infiltrations of a few bacilli, while others showed large numbers of acid-fast bacilli with little perineural infiltration. Vascular changes were noted in a few specimens with periarteritis and bacilli. Vacuolated histiocytes were full of bacilli and also bacilli were found in globi between the axons. Histiochemical observations were of neutral fat, phospholipids, and polysaccharides positive to PAS. Glycogen could not be demonstrated in the cells. Staining with alcian blue showed a fair amount of acid mycopolysaccharides in the dermal connective tissue and Langhan's giant cells.

(**22**) *Borderline Type of Leprosy* by D. CHAKRABARTHY. The author mentions that the borderline type of leprosy, though recognized lately, was mentioned in the Bagvat Nidan of A.D. 200. It is important to recognize it, and he describes six types of borderline manifestations, the central depressed, the extension, the reversed saucer, the ring, the pseudopodial, and the miliary lesion. Borderline is a type which starts and ends as borderline, and it seems that the bacteriologically positive tuberculoid reaction and the reactional tuberculoid are really borderline. The author suggests a new nomenclature which includes the intermediate and its subtypes and introduces a dimorphous group with two subtypes, namely the papular dimorphous (PD) for borderline type, and macular dimorphous (MD) for bacteriologically positive indeterminate patients. Bacteriologically negative forms of indeterminate should not be diagnosed as leprosy in the absence of cardinal signs of the same.

(**23**) *Histopathological findings in cutaneous lesions of Borderline Leprosy* by C. G. S. IYER and P. B. NATH. The authors studied biopsies of cutaneous lesions of 78 patients with borderline leprosy, and some repeat specimens were obtained at intervals of four months to one and a half years. They classified the histological findings with a view to noting any changes in the tissue reactions, content of acid-fast bacilli, and correlation with clinical progress.

(**24**) *Clinical and Pathological Observations on Reactional Stages of Leprosy Including Borderline Leprosy* by M. NISHIURA. The author is carrying out a similar study as the previous authors on reactional conditions in leprosy on material from patients in Thailand and Japan.

(**25**) *Borderline Leprosy* by K. RAMANUJAM and G. RAMU. The authors studied material from 70 outpatient borderline patients at Chingleput over two years, and reported findings. Rebiopsies after subsidence were done in most of the patients.

(**26**) *Physical Medicine in Leprosy* by MRS KAMALA V. NIMBKAR. The author discusses physical agents, mechanical devices, manipulation, massage and exercise, and total rehabilitation which is built on physical medicine.

(**27**) *Post-Operative Physiotherapy Management of Lumbrical Replacement in Leprosy* by SRI N. PALANI. The author discussed standardised operations for the correction of claw hand. The five points which therapists should note at the removal of the immobilising plaster cast are indicated as search for oedema, state of wound healing, note whether any extension limitation of the metacarpophalangeal joint, an angle assessment of fingers and range of motion at every joint.

It is important to give careful management if oedema is found, to avoid prolonged resolution and consequent fibrosis and tendon adhesions. For anaesthetic hands uncontrolled violent exercises are harmful. An ulnar forearm gutter splint is suggested for ulnar drift to the hand. The author found that the graft passing through the carpal tunnel injures the median nerve in extensor flexor manytailed operations. There is great success in correcting claw hand in careful selection of cases, preoperative and post-operative physiotherapy, and in surgical and re-educational methods.

(**28**) *The Use of Physiotherapy in the Preservation and Treatment of the Thumb in Leprosy* by MISS C. THISTLETHWAITE. A good range of abduction is important to the thumb, and contracture makes it unsightly. Physiotherapy can help in prevention of injury, infection, and absorption, and prevention of contracture can be attained by inspection, oil massage, and extension exercises. Prevention of contracture of the thumb web by early inspection for opponens and short abductor paralysis, followed by oil massage. In the treatment of contractures wax, oil, exercises, and splints can all be used beneficially. There is special treatment in relation to certain operations, and re-education exercises should not be forgotten.

(**29**) *The Hand in Acute Stages of Leprosy* by SRI PAUL R. NAMASIVAYAM. Many leprosy patients pass through acute episodes and neuritis, and can be helped here by physiotherapy to prevent stiffness and minimise deformities. In a follow-up study the author found mere paralysis did not lead to stiffness, and that acute episodes are very important in producing stiffness. Great benefit can follow the use of heat, rest, and exercises in the care of the hands in acute episodes.

(**30**) *The Necessity of Physiotherapy Following Reconstruction Operation* by S. L. KOLUMBAN. The importance of physiotherapy *after* a reconstruction operation is emphasized. This phase is crucial and often leads to success or failure of the operation. There is post-operative recommended physiotherapy for every operation, though rather than a set routine, the physiotherapy procedures should be adapted to every problem.

(**31**) *Response to Physiotherapy of Patients with Lumbrical Replacement Operations in Lepromatous and Non-Lepromatous Types of Leprosy* by W. H. JENNINGS. In Kondhwa Leprosy Hospital four different types of lumbrical replacement operations were done on 163 patients, and post-operative physiotherapy was done with warm emollients, and re-educational and mobilisation exercises, and later splinting. Response was good in non-lepromatous patients but lepromatous patients generally did not respond well. For the problem of stiff hands one of the surgeons DR J. M. MEHTA has suggested ionisation with two per cent potassium iodide. Of three patients so treated two have improved.

(**32**) *Recent Applications of Experimental Human Leprosy in the Mouse Foot Pad* by R. J. W. REES. In 1960 Shepard, working in the United States of America, claimed the successful transmission of human leprosy in the mouse foot pad. We have confirmed his claim and at the VIIIth International Congress of Leprology the Committee on Pathology and Experimental Transmission accepted that this type of infection was due to the human leprosy bacillus. This discovery is of the greatest importance and provides, for the first time, an experimental infection for studying the pathogenesis of leprosy.

In our studies we have successfully transmitted human leprosy in the foot pads of mice from 33 patients from different parts of the world; Malaysia (25), Burma (6), East Africa (1) and the West Indies (1). Twenty-seven patients had lepromatous and six borderline or near tuberculoid type leprosy but the type of infection in the foot pad was identical. Although the infection is confined to the foot pad and the bacillary increases are limited to approximately 100 fold, the infection can be maintained successfully by passage from foot pad to foot pad and some of our experiments are in the fourth passage in mice. The infection is suitable for testing the activity of drugs and already we have compared the activities of dapsone, thiambutosine, thiacetazone, phenazine and several of the long-acting sulphonamides. Furthermore, it has been possible to show that the bacilli from some patients who have failed to respond to dapsone are resistant to dapsone treatment in the mouse foot pad. This is the first irrefutable experimental evidence for the existence of DDS resistance strains of *Myco. leprae*. Studies have been undertaken to determine the viability (infectivity) of leprosy bacilli recovered from patients after one or more years treatment with dapsone. As in man, nerves are infected in the mouse foot pad infection. The results of these studies and attempts to enhance the infection in the mouse foot pad were discussed in the meetings.

(**33**) *Facial Nerve Exploration in Leprosy* by N. H. ANTIA and S. C. DIVEKAR. Lagophthalmos is a common complication and the superior branches of the facial nerve are most commonly affected in India. The authors evaluated the pathology of the facial nerve in a preliminary exploration in ten lagophthalmos patients wherein temporalis muscle transfer was to be done. The naked eye and electrical findings were recorded, and the paralysed segment of the nerve excised for histology. DR D. K. DASTUR will present the histopathology in another paper following.

(**34**) *The Facial Nerve in Leprosy* by D. K. DASTUR, N. H. ANTIA, and S. C. DIVEKAR. It was noted at the time of operation that gross change in morphology, if any, was confined to the branches of the facial nerve passing over the zygomatic bone region, especially in the branch pointing to the lower eyelid. There was thickening and firmness of feel of this branch. Even when such a gross change was not noted, electrical response was defective to stimulation of nerve or nerves in the territory in any muscle of the affected region. Histology showed pronounced degeneration of nerve fibres with severe inflammatory and fibrotic reactions of varying degrees. Acid-fast bacilli were occasionally seen.

(**35**) *Experimental Transmission of Human Leprosy Infection to a Hybrid Inbred Strain of Black Mice* by K. R. CHATTERJEE and R. J. W. REES. The use of a hybrid inbred strain of black mice in the studies of transmission of human leprosy to laboratory bred animals was first reported from the School of Tropical Medicine, Calcutta in 1958. Since then this work was carried out at different laboratories of the World. At the National Institute for Medical Research, London, since 1960, 24 experiments were undertaken with this strain of mice brought from Calcutta and maintained at the Institute. Two of these experiments were carried out with 'Freeze-dried' bacilli from mouse passage material from Calcutta but they did not produce infection. The remaining 22 experiments were undertaken with material from fresh biopsies received from Malaya, Burma and Africa.

Two of the biopsies were found to contain culturable acid-fast bacilli and so they are being followed up separately. In nine out of the 20 experiments progressive infection has been established. On an average each mouse received a dose in the order of $10^7$ to $10^8$ freshly isolated *M. leprae* but during the passages from animals to animals the dose depends on the harvest. The viability of the bacilli as judged from the percentage of solidly stained organisms varied from 20 per cent to 85 per cent with a mean near 50 per cent. To begin with the mice required 8 to 12 months to manifest the infection but once established the mice reached the peak of infection in about 5 to 6 months. Of the 9 successful transmissions, 2 are now in the eighth passage stage, 4 in the seventh, 1 in the fifth and 3 are in the third passage stage.

To begin with the progressive lesions were of mild nature and fewer animals were affected. However, with passages the mice developed more gross and heavy

infection. Once established the infection tends to become more generalised involving liver, spleen, lymph nodes, lungs, skin and nerves. The salient features observed in the infected animals were the involvements of the peripheral nerves in about 80 per cent of the animals. From very mild to heavy infiltration with intracellular acid-fast bacilli was noted in the peripheral nerves. The generation time of the organisms in the animals is round about 20 days. Immunological and serological studies made to compare the antigenic components of the organisms with those of other mycobacteria including *M. leprae* and *M. lepraemurium* are in progress.

(**36**) *Liver Function in Leprosy* by ANNIE VERGHESE and C. K. JOB. The authors studied 20 leprosy patients and estimated liver function. In the lepromatous leprosy group of 11 patients only one patient had a haemoglobin below ten G per cent and two had a raised prothrombin time. All had high globulin and only one had a low albumin level and two showed slight abnormality of BSP excretion, with only one showing significant retention of dye.

In the borderline group of seven patients, the haemoglobin was above ten G per cent in all, with a raised prothrombin time in one. The albumin was low in one and the globulin raised in one. In two patients there was slight abnormality of BSP excretion in two, and significant retention of the dye in one. Focal granulomata were present in the liver in all except two patients.

The two tuberculoid patients studied had normal liver function and no lesions in the liver.

The presence of granulomatous inflammation in the liver of leprosy patients does not necessarily diminish liver function.

(*Note:* Description of papers from the Leprosy Workers' Conference will have to be made in a later issue of *Leprosy Review*, probably the July issue – Editor).