DESTAQUES

Razões de ordem técnica determinaram, quando do preparo e ordenação do material dêste número, a reunião, sob o título acima, da matéria que a seguir publicaremos e após a leitura da qual nossos leitores melhor compreenderão os motivos que nos levaram a criar mais esta secção na Revista Brasileira de Leprologia.

Reunidos os trabalhos que, assinados por destacados nomes da leprologia nacional, tanto valorizam e prestigiam êste número especial da Revista, desde logo pensamos na possibilidade de publicar também as conclusões do VII.° Congresso Internacional de Leprologia; e, nossa idéia desde logo se nos afigurou realizável pois, como membro da Delegação Brasileira e como representante devidamente credenciado da Sociedade Paulista de Leprologia, se inscrevera, como participante do Congresso de Tóquio, o nosso prezado colega Prof. LUIZ MARINO BECHELLI que, solicitado, de pronto se comprometeu a nos enviar, com a possível urgência e pela via mais rápida, as conclusões e recomendações daquele conclave.

Assim, dada a bôa vontade e a dedicação do Prof. L. M. BECHELLI para com a Sociedade Paulista de Leprologia, pode a Revista Brasileira de Leprologia estampar em suas páginas as deliberações do Congresso de Tóquio, deliberações estas aguardadas com o maior interesse pelos leprólogos brasileiros.

Publicando agora, em seus textos originais, os Relatórios das Comissões Técnicas do VII .° Congresso Internacional de Leprologia, compromete-se esta Revista a publicar, em seu próximo número, (n.° 1, vol. 27, março 1959) a tradução dos referidos Relatórios para o que já foram tomadas as necessárias providências.

Encontrarão ainda nossos leitores em "DESTAQUES", o discurso pronunciado pelo dr. JOAO BAPTISTA RISI na sessão solene com a qual a Sociedade Paulista de Leprologia comemorou, no dia 23 de agôsto, o 25.º aniversário de sua fundação.

Oração altamente desvanecedora para todos nós pelos conceitos expendidos pelo ilustre Presidente da Associação Brasileira de Leprologia na análise generosa que fêz da projeção da Sociedade Paulista de Leprologia e da Revista Brasileira de Leprologia no cenário da leprologia brasileira, mais ainda a todos sensibilizaram as palavras com as quais o dr. J. B. RISI traçou o histórico da nossa Sociedade enaltecendo as figuras de seus fundadores e revivendo, em sentido preito de saudade, os vultos dos companheiros que já se foram do nosso convivio.

Registrando as palavras do dr. JOÃO BAPTISTA RISI nas páginas desta Revista, deixamos aqui consignados à Associação Brasileira de Leprologia os agradecimentos dos leprólogos paulistas há vinte e cinco anos congregados em terno da Sociedade Paulista de Leprologia e procurando, com seus trabalhos, enaltecer sempre e cada vez mais a Leprologia Brasileira.

VII CONGRES INTERNATIONAL DE LEPROLOGIE

TOKYO, JAPON
(Novembre 12-19, 1958)

RAPORT DU COMITÉ TECHNIQUE SUR LA CLASSIFICATION

DR. K. KITAMURA	(Panel Chairman)
DR. R. G. COCHRANE	(Panel member)
DR. DHARMENDRA	*(“ ”)*
DR. F. RABELLO	*(“ “)*
DR. R. ROLLIER	
DR. J. GAY PRIETO	
DR. N. D. FRASER	

Etant donné nos désaccords et la difficulté d'étudier en détail revolution de la lepre au point de vue histopathologique, le Comité propose que les recommandations soient limitées à souligner encore que la base de la classification doit être en premier lieu clinique. Une classification plus detaillée ne peut être presentee dans ce Congrès étant donné l'absence d'études detaillées et l'impossibilité pour le Comité d'étudier les aspects histopatologiques des lesions lépreuses par rapport aux manifestations cliniques. Pour cela le Comité pense, qu'avant le prochain Congrés, it serait nécessaire d'étudier une classification plus détaillée.

On admet, généralement qu'il existe deux types polaires de lèpre: la forme lépromateuse et lee lésions infiltrées tuberculoides. Ainsi les definitions de Madrid, concernant les manifestations cutanés de ces deux types demeurent inchangées.

D'autre part les définitions de la classification de Madrid, pour lee groupes Indeterminés et Borderline (Dimorphe) sont également inchangées.

En ce qui concerne les lésions tuberculoides, le Comité accepte la definition du Congrès de Madrid, it s'agit de lésions infiltrées tuberculoides pouvant être subdivisée en tuberculoides majeurs et tuberculoides mineures.

Le Comité n'a pu arriver à un accord quant aux lésions maculo-anésthesiques. Les léprologues Indiens, pensent, qu'en raison de leur nette entité clinique, et leur relative fréquence aux Indes ces lésions doivent former un groupe special dit, Maculo-Anésthesique. Dans leur esprit, ce ne sont pas de lésions tuberculoides et c'est pourquoi it ne peuvent accepter de les Glasser dans ce groupe polaire.

Les léprologues Latino-Américains, quant à eux, considerent que ces lésions présentent des symptomes suffisamment nets pour les inclure dans le groupe polaire tuberculoide.

La decision en cette matière doit, à notre avie, être laissée à chague léprologue et le Comité ne prend aueune décision.

Enfin, en ce qui concerne les lesions névritiques puree (poly ou mono névritiques) le Comité recommande une etude plus détaillée de ces lesions, mais note qu'il existe un désaccord quant à leur place dans une classification de base. Les léprologues Indiens pensent, encore, qu'étant donné leur importance, elles forwent une entité clinique et doivent former un groupe separé dénomme *névritique.*

Pour leur part, les léprologues Latino-Américains pensent que l'examen et l'observation approfondie de ces lésions permettent de les classer dans les groupes tuberculoides ou indéterminés.

La décision en cette matière doit être laissé à chaque léprologue et le Comité n'a pas de recommandation précise à faire.

Le Comité de Classification demande à la session plenière de préparer une résolution demandant au WHO de convoquer un Comité spécial de chercheurs particulièrement intéressés par les aspects histopathologiques et cliniques de la lèpre.

Le but de ce Comité serait d'étudier en détail l'histopathologie de la lèpre, ses rapports avec l'aspect clinique et leurs variations suivant les races. Leurs recherches seraient illustrées de manière demonstrative et présentées Tors du prochain Congrés International de Léprologie.

SEVENTH INTERNATIONAL CONGRESS ON LEPROLOGY

TOKYO, JAPAN

(November 12-19, 1958)

REPORT OF THE TECHNICAL COMMITTEE ON

THERAPY

DR. J. N. RODRIGUEZ	(Panel chairman)
DR. P. BRAND	(Panel member)
DR. T. DAVEY	*(“ “)*
DR. W. H. JOPLING	
DR. TAKASHIMA	*(“ “)*
DR. M. LECHAT	
DR. N. P. BUU-HOI	

INTRODUCTION

During the five years which have elapsed since the 6th International Congress, the use of sulphones in the treatment of leprosy has expanded enormously, and the effectiveness and limitations of this group of compounds are now more generally understood. At the same time, estimulated largely by research in the field of tuberculosis, several new substances have been found by leprosy research workers to possess activity against *M. leprae,* but as yet none of these has displaced the sulphones from their position of pre-eminence in the treatment of the disease.

A major development has been the expansion of sulphone therapy in mass campaigns based on ambulatory treatment, and it would appear that this is becoming an important public health measure in endemic areas; the low cost of DDS and the comparative safety of its administration through auxiliary personnel makes it the drug of choise for this purpose.

This report will summarize the present position regarding the treatment of leprosy in its various aspects.

Sulphone Therapy

Although some leprologists still make use of the more complex sulphones, the parent sulphone, 4,4' diamino-diphenyl sulphone is the one most widely used.

In many areas, 600 to 800 mg per week is found to be a satisfactory optimum dose in adults, but there appears to be considerable variation in the degree of tolerance exhibited by different racial groups, and doses ranging from 300 to 1,200 mg per week are sometimes employed.

It is of fundamental importance, in order to minimize possible side effects, that the initial dose should be low, and be increased gradually to the optimal dose over a period of two to four months. Oral treatment may be given daily, twice weekly, or when necessary, weekly. The initial dose is usually in the range of 50 mg twice weekly to 50 mg daily, and this should not be exceeded. This dose should be increased by small increments at not less than 10 day intervals.

Under certain conditions it may be desirable to administer sulphones by injection. In mass treatment campaigns where it may be necessary to have a long acting sulphone preparation, suspensions of DDS have been employed. A variety of vehicles, oily and non-oily have been used, but further research is needed in order to secure a more effective repository effect and at the same time diminish discomfort on injection.

Whichever method of treatment is used, it is important that therapy should continue for some time after clinical and bacteriological resolution of the disease, but more data regarding the incidence of relapses are required before definite rules can be laid down regarding the length of time during which chemotherapy should be continued.

TOXIC EFFECTS AND COMPLICATIONS OF SULPHONE THERAPY

Although toxic effects are not common when sulphones are used in a normal treatment routine, it is obligatory on all those using these compounds to be aware of them and of their management.

Important toxic manifestations include, anaemia, dermatitis, hepatitis and psychosis. Complications of leprosy occurring during therapy may take the form of reactional states such as *erythema nodosum leprosum*, acute neuritis, and irido-cyclitis.

With the exception of milder degrees of anaemia, toxic manifestations call for the immediate cessation of sulphone treatment and subsequent extreme care in its re-introduction. Corticosteroids have been found very usufel in the treatment of dermatitis and subsequent dessensitization by minute but increasing dosis of sulphone is of proved value.

Management of reactive episodes

1. *ERYTHEMA NODOSUM LEPROSUM.*

This is a well known complication in lepromatous patients during chemotherapy, and may require a decrease in dosage or, if severe, withdrawal of the drug for a period of time.

Many cases respond promptly to a short course of antimony injections. Spectacular results have been obtained by the use of A. C. T. H., cortisone, or more recently introduced analogues. Although short courses of treatment with corticosteroids may be adequate, in some cases it may be necessary to give prolonged treatment under close medical supervision, with gradual reduction of dosage. Other methods of treatment such as chlorpromazine, chloroquine, vitamin K and vitamin B12 have been tried. Intravenous infusions of blood and plasma have also been employed.

2. *REACTION IN TUBERCULOID LEPROSY.*

Corticosteroids have proved of value in the treatment of tuberculoid reaction.

3. *ACUTE NEURITIS.*

Acute neuritis may occur alone or in association with erythema nodosum. Procaine, hyaluronidase, or hydrocortisone, injected intra-neurally, alone or in combination, have given relief from pain. Reference is made later to the place of surgery in this complication.

4. *LEPROMATOUS ORCHITIS.*

This complication responds well to corticosteroids.

5. *IRIDO-CYCLITIS.*

In lepromatous leprosy bacterial invasion of the anterior segment of the eye is common, and some recurring irido-cyclitis continues to be seen even in sulphone-treated patients. The acute condition usually responds to local application of steroids, either in the form of eye drops of 0.5% to 1.0% cortisone, ointment, or sub-conjunctival injections, accompanied by the use of mydriatics. In the management of ocular manifestations, slit lamp biomicroscopy is of definite value as it may reveal early involvement of the uveal tract. and so lead to prompt treatment and the prevention of secondary glaucoma.

Corneal ulceration in tuberculoid leprosy is invariably secondary to lagophthalmos Otnd anaesthesia; it may be minimised by the use of lubricating eye drops and the wearing of eye shields. Blepharoplasty is indicated in some cases.

Rhino1aryngological Manifestations.

Active lesions of the mucosa of the nose and upper respiratory tract usually respond promptly to systemic sulphone medication. In cases of long standing however, the management of chronic atrophic rhinitis (ozoena) is not always satisfactory. The use of a trypsis containing ointment has been helpful in facilitating removal of crusts and in improving nasal hygiene.

Although lepromatous lesions of the larynx are still seen, sulphone therapy supported by the judicious use of antibiotics to control intercurrent infection. has made it possible to avoid tracheotomy in practically all cases.

OTHER THERAPEUTIC AGENTS

Reference was made in the report of the last congress to several drugs other than the sulphones for which claims of activity in leprosy had been made. In recent years others have appeared, and the present position may be summarised as follows.

(a) *CHAULMOOGRA OIL AND ITS DERIVATIVES.*

Nearly all workers have abandoned the use of chaulmoogra oil except as a vehicle for the administration of sulphones by injection. In dark skinned patients it may have a cosmetic value, given in the form of intra-dermal injections, in encouraging the repigmentation of pale macules.

(b) *THIOSEMICARBAZONE (TBI).*

This compound has been used fairly widely as an alternative to sulphones in a daily dosage in adults of 100 to 200 mg. It is effective, but has toxic

qualities of about the same order as DDS. Agranulocytosis has occasionally been reported in susceptible individuals. Progress during the first year of administration is usually good in all types of leprosy, and may be maintained subsequently at this level, especially in tuberculoid cases and those with neural involvement. Some workers have found a less satisfactory response in lepromatous cases later, with the appearance of drug resistance after one or two years of treatment. Relapse following TB1 therapy is not rare, but has been very rare in patients who have been treated with alternate courses of DDS and TB1.

(c) *ISONICOTINYL HYDRAZIDE (INN).*

Reports on the usefulness of INH in the treatment of leprosy continue to be conflicting, but a majority of leprologists consider it of little value as a routine form of treatment.

(d) *STREPTOMYCIN.*

Streptomycin has been used usually combined with INH, by some workers in patients unable to tolerate sulphones.

Among recently introduced preparations the following are prominent.

(e) *DIAMINO-DIPHENYL SULPHOXIDE (DDSO).*

This compound which is closely related to DDS has been used in several centres, and reports on it are generally favourable. Its dosage follows that acceptable for DDS, and it has been found to be an effective drug whether given daily or twice weekly. Reactions, particularly neuritis, have been encountered less frequently than with DDS, and in individual patients progress has been very gratifying. The toxicity of DDSO appears to be no less than that of DDS and may be a little greater. Further studies are needed on the toxicity of the drug and its effect in the later stages of treatment. At present DDSO is rather more expensive than DDS.

(f) *THIOUREA DERIVATIVES.*

During the past three years, certain derivatives of diphenyl thiourea have been shown to be effective anti-leprosy drugs. 4 butoxy-4' dimethylamino diphenyl thiourea (CIBA 1906) has been studied in several centres and in a daily dose of 25 to 40 mg per kilo of body weight has exhibited an activity at least as great as that of DDS. This drug has the advantage of an almost complete lack of toxicity, and therapeutically has proved very useful in all conditions in which DDS therapy is unsuitable. The desirability of daily administration and the relatively high cost of treatment make the drug unsuitable at present for mass treatment. It combines well both with DDS and INH, but further study of its late effects is needed, as it has not yet been in use for a period sufficient to determine whether or not late drug resistance may be encountered.

4,4' di-ethoxy-diphenyl thiourea has also exhibited activity against M. *Leprae* and freedom from toxicity, and there seems little doubt that the thiourea group of compounds holds much promise and deserves careful investigation.

(g) *DERIVATIVES OF ETHYL MERCAPTAN.*

In a group of compounds related to the thioureas, evidence has begun to appear that certain derivatives of ethyl mercaptan may also possess activity against *M. Leprae.* Their study must be regarded as purely experimental at present.

(h) *CYCLOSERINE.*

Preliminary reports suggest that this antibiotic may possibly possess activity against *M. Leprae* in doses of between 250 and 750 mg daily. but undesirable side effects may limit its usefulness, while its cost at present is prohibitive. Further study will be needed before its place in the chemotherapy of leprosy can be determined.

Other preparations under trial include kanamycin and an oxdiazolone named Vadrine.

(1) *ANTIGEN MARIANUM*

Although some earlier studies suggested that improvement may occur with the use of this preparation, more detailed recent observations have been disappointing. The general use of this agent in the treatment of leprosy is not recommended.

GENERAL CONSIDERATIONS

The study of new drugs should be encouraged only in circumstances where the careful observation of adequate numbers of patients can be made by experienced leprologists with full laboratory facilities. Premature conclusions based on the observation of very few patients for short periods should be discouraged, but where the above conditons hold good, small pilot trials may be a useful preliminary to investigations on a larger scale.

THERAPY RESEARCH

The favourable results of the present methods of chemotherapy of leprosy should not be allowed to obscure the great need for newer chemotherapeutic agents acting with greater speed and efficacy or to handicap research directed towards the establishment of more effective treatment. A useful lead in this research is afforded by the fact that all the drugs useful against leprosy so far known possess antitubercular activity, although the reverse may not in every case be true. Research should be also directed towards an explanation for the discrepancies often observed between the chemotherapeutic results obtained in human leprosy and those obtained in murine leprosy animal tests. There is urgent need for large scale, carefully planned and accurately conducted therapeutic trials of certain agents already available, and of new agents as they become available. Such trials should include studies of possible therapeutic agents given singly, or in combination where no cross-resistance between the various drugs to be in such combined therapy is evident. In view of the rather wide differences of results of chemotherapy in people of different races, therapeutic trials should be made in different centres and in different countries.

The response of a suitable group of cases of leprosy to the well established DDS (4:4'-diaminodiphenylsulphone) should be used as the control in experiments designed to assess the value of newer drugs.

Physical Therapy and Reconstructive Surgery

While Chemotherapy has greatly improved the general outlook in the treatment of leprosy, and may often prevent the onset of paralysis, it has little or no effect on those deformities which are secondary to nerve involvement. Further study of the pathology of deformity in leprosy and its treatment is an urgent need. In the meantime it has become apparant that a large proportion of the deformities of leprosy are correctable by plastic and orthopaedic surgery, and that even in the absence of surgery a simple educational programme backed by physical therapy can considerably reduce the incidence of deformity.

This summary is divided into three section, A) Education B) Physical Therapy C) Reconstructive surgery. It is urged that even before facilities are available for C and B most treatment centres shouud be able to do good preventive educational work with the help of social workers trained in the principle of A.

A) *EDUCATION:* All patients with anaesthetic hands and feet should be taught about the hazards from which pain no longer protects them. They should be convinced that most of the deformities of leprosy are preventable or correctable. They should learn to:

1. Use special handles and holders for hot articles.
2. Inspect their own hands and feet daily for thorns and blisters.
3. Dress and splint every wound, and keep it splinted until it heals.
4. Wear well-fitting shoes or sandals and avoid any shoes made with nails.
5. Rest the hands during lepra reaction, and when they are swollen. A splint should be provided for such occasions.
6. When paralysis and clawing occur, they should begin a daily routine of oil massage and exercises designed to keep the fingers fully mobile.
7. As part of the educational programme the patient may need advice about a form of employment that will not harm his hands or overtax his feet.

B) *PHYSICAL THERAPY:* When a fully qualified Physiotherapist is not available the work may be carried out by a person with limited training. Such training should be given at centres with qualified and experienced staff.

The following techniques `have proved useful:

Massage, taught to the patient and carried out by himself.

Wax Baths, especially for stiff joints, and for dry non-sweating skins. Splintage. This is extremely useful for contractures. A good method is hope of recovery, and of post-operative re-education.

Infra red irradiation for nerve pain.

Whirlpool baths.

Splintage. This is extremely useful for contractures. A good method is to apply light plaster of paris casts to each finger, with the finger held gently in extension, and to re-apply them daily after exercise.

Exercises, carried out individually and in drill groups, and including passive movements, assisted active, and active exercises. Occupational therapy. This is of great importance, and is best carried out as part of a full rehabilitational programme.

C) *RECONSTRUCTIVE SURGERY:* It is strongly urged that orthopaedic and plastic surgery should not be attempted until proper facilities and trained surgeons are available.

Orthopaedic, plastic, and ophthalmic surgeons in general hospitals should be encouraged to take up this work in their own institutions, or to work part time in properly equipped leprosy sanatoria. Alternatively reconstructive surgery in leprosy may be taken up as a whole-time speciality at certain centres to which surrounding smaller institutions and clinics can refer their patients.

The following have proved useful:

The Face

For mild nasal deformity — Dorsa and columellar bone grafting.

For severe nasal deformity — excision and free grafting of the lining of the nose, by GILLIES technique, followed later by an internal prosthesis or by bone grafting.

For eyebrow loss — Scalp grafting by the 'island flap' technique, or by free implantation of hair follicles.

For lagophthalmos — Tarsorraphy or Fascial slings.

For wrinkling and sagging of the skin — Excision of loose folds, and face-lifting.

The Hand

For clawing of fingers — lumbrical replacement by tendon freegrafts (BRAND) or by Sublimis transfer (STILES-BUNNELL) or by FOWLERS tecnique.

For thumb paralysis — Abductor-opponens replacement (Riordan) after correction of thumb web.

For radial paralysis — Wrist fusion, followed by transfer of Flex. Carpi Radialis to Ext. Digitorum, and Pronator Teres to Ext. Pollicis Longus.

For gross irreversable contracture — Anterior skin grafting and interphalangeal arthrodesis.

The Foot

For foot drop — Transfer of tibialis posterior to middle cuneiform bone. For lateral instability — Triple arthrodesis.

For claw toes (hammer toe) — Transfer of Flex. Digitorum Longus.

For recurrent ulceration, if bone seems to be the cause — Sequestrectomy, and removal of any ventrally-projecting spurs or ventrally subluxated portions of bone. (DREISBACH).

For gross extensive ulceration — when necessary, amputations, such as LISFRANC SYMES, and site of election, followed by special shoes or artificial limbs.

Non-operative treatment of chronic ulceration

Although many treatments have been recommended, the following principles are basic:

Acute phase, with cellulitis — Rest and Elevation, and Penicillin. Chronic stage — Plaster of paris cast (below knee) padded only at malleoli and at ulcer. Walking iron or rocker.

Healed stage — A shoe that is moulded to take weight on good skin, and hollowed to spare the scar. A soft or sorbo insole is an advantage. In severe cases the sole should be rigid in its lenght, and have a rocker.

Nerves

Ulnar nerve stripping has a place in the treatment of intractable nerve pain.

The stripping should be limited to the superficial aspect and care must be taken to avoid division of blood vessels entering through the sheath.

Ulnar nerve transposition as prophylactic measure to avoid paralysis may be of value if the nerve is well buried in muscle.

Gynaecomastia.

Simple mastectomy through the Areolar incision of WEBSTER.

The Committee on Therapy wishes to recommend to the International Leprosy Association that a small continuing Committee be established, to share information between research workers engaged in therapy studies, and endeavour to secure as much coordination of effort as possible.

SEVENTH INTERNATIONAL CONGRESS ON LEPROLOGY

TOKYO, JAPAN

(November 12-19, 1958)

REPORT OF THE TECHNICAL COMMITTEE ON BACTERIOLOGY AND PATHOLOGY

DR. J. H. HANKS (Panel chairman)
DR. K. R. CHATTERJEE (Panel member)
DR. R. J. W. REES (" ")
DR. D. S *RIDLEY* *(“ “)*
DR. C. H. BINFORD
DR. J. MACFADZEAN
DR. Y. HAYASHI
DR. R. AZULAY

The disciplines of bacteriology, immunology and pathology are tools for acquiring knowledge concerning *M. leprae,* and the interactions between this bacillus and its host. Since an animal host has not been available and *M. leprae* has not been cultivated on bacteriological media or in cell cultures, microbiological research has made but limited contributions to an understanding of this disease. Studies in pathology, on the other hand, have illuminated many features of the host response to *M. leprae.*

The Committee now undertakes to evaluate the status of knowledge in Bacteriology and Pathology, and in particular to discuss problems and prospects for the future.

BACTERIOLOGY

PRACTICAL CONTRIBUTIONS AND PROSPECTS: The major contribution of bacteriology has been methods for estimating the numbers of bacilli recovered from scraped skin incisions. Because of the *usefulness* of such data in diagnosis, classification and assessing the progression or regression of infection, these simple methods deserve further careful development and eventual standardization.

The shortcomings of present methods are: the difficulty of preparing standard dilutions from samples of unknown volume, the labor of evaluating a series of samples from each patient, and the unreliability of averages derived from these crude estimates. Data of greater significance could be obtained with much less effort by pooling a series of samples from appropriate skin sites and by making quantitative microscopic observations in standard films prepared from the pool.

A further problem concerns methods of maximal sensitivity for specific diagnosis in persons carrying minimal numbers of bacilli and also for demonstrating acid-fast organisms in persons who live in contact with open cases, but exhibit no lesions. Although principles for the concentration of mycobacteria are well understood, it is questionable whether their efficiency compensates for the dilutions involved in making tissue emulsions. Useful information might result from comparisons between: (a) dense films prepared directly from skin scrapes, (b) contact impressions from small biopsies, and (c) concentrates prepared after emulsifying the same tissues.

Special Problems

CULTIVATION OF M. LEPRAE: The most notable interaction between *M. leprae* and its host has been the evolution of a mycobacterium which appears

to depend upon specific system within its natural host. The mycobacteria cultivated from lepromatous tissues are regarded as incidental or passenger strains rather than as causative agents.

Another host-dependent mycobacterium, *M. lepraemurium,* has been found incapable of obtaining energy from substrates *in vitro.* This appears to explain the failure of such microorganisms to propagate on bacteriological media. It should be recognized that the socalled cultivable pathogens, e. *g.,* tubercle bacilli from cutaneous lesions and resected lung lesions and Johne's bacillus from sheep may also fail to propagate *in vitro.* Investigation of these problems should assist in defining requirements which permit host-adapted mycobacteria to grow independently.

M. leprae has not been shown to proliferate in cell cultures containing any of the three •major cell types. This indicates that the problem is not solved merely by protection within intracellular environment nor by the metabolites which all cells elaborate. It suggests that there may also be dependence upon enzyme systems or hormones from more specialized cells within the host. If principles pertaining to this problem are to be studied in model systems, *M. lepraemurium* is perhaps the most useful organism. This preference is not based solely upon the failures of this organism to proliferate independently, nor upon its universal availability and measurable infectiousness. The special merit of *M. lepraemurium* is its naturally declumped state, which alleviates grave problems in obtaining significant microscopic data, and the fact that limited multiplication has been observed in cell cultures.

It appears, therefore, that the cultivation problem may be solved into two basic approaches: (a) direct study of the deficits and impediments in the non-cultivated mycobacteria and (b) the finding of tissue-cell or other biologic systems which can substitute for natural hosts.

TRANSMISSION TO ANIMALS: Physiologic and imn'unologic investigations continually reveal factors which modify the subtle balances between bacteria and their hosts. Factors emphasized in reports were: genetic susceptibilities in inbred hybrid animals, hormonal modification of physiology, the inoculation of cool organs in which defense mechanisms may be least effective, and the use of washed suspensions of *M. leprae.* This work deserves further study and confirmation.

The assessment of results in transmission studies are fraught with technical difficulties. Sound conclusions may require control groups of uninoculated animals and of animals inoculated with inactivated bacilli, coded experimental groups, and predetermined methods of numerical or histological evaluation.

METABOLIC AND CYTOLOGIC STUDIES: As matters now stand, the classical tools of microbiology have not revealed the secrets of *M. leprae.* It is useful, therefore, to develope methods which yield information in the absence of growth. Many of the difficulties in metabolic studies may be due to impermeability of the organisms. Cytologic methods can be applied to bacilli recovered from patients by the usual methods. In the field of general microbiology, cytochemical and enzymatic studies combined with electron microscopy are developing surer knowledge of relationships between structure, function and physiologic states. Comparative studies with other mycobacteria must be included as a basis for interpretation.

PATHOLOGY

Descriptions of the pathology of leprosy have improved in accuracy and detail over a periodo of many years. It is known, therefore, that active leprosy involves primarily the cooler tissues: superficial nerves, skin, testes and nasal and upper respiratory mucosae. The higher degrees of resistance in tuberculoid leprosy seem to confine infection to the superficial nerves and skin. In lepromatous leprosy destruction of bone and muscle may occur but is thought to result, as a rule, from neural involvement. In lepromatous leprosy prodigious

numbers of bacilli occur in cells of reticulo-endothelial origin, but the accumulation of organisms in the deeper reticulo-endothelial system (liver, spleen and adrenals) is thought to be due to bacteremia and phagocytosis rather than to significant multiplication.

PRACTICAL CONTRIBUTIONS AND PROSPECTS: Pathology provides practical histologic tools for diagnosis, classification and prognosis, and for assessing the progression or regression of leprosy.

HISTOLOGICAL TECHNIQUES: Refinements of the FITE-FARACO process during the last few years have made it possible to demonstrate leprosy bacilli in paraffin sections much more reliably than in the past. The improvements have not been due to modification of carbolfuchsin stains, but to deparaffinizing by methods which do not remove so many bacilli from sections, the use of procedures which tend to "restore" a more acid-fast character to bacilli of poor tinctorial quality, more precise methods of decolorization or differentiation; and formalinization of stained bacilli to accentuate the coloration and render it more permanent.

Where difficulties are met in spite of these improvements, an important factor is the scarcity in many areas of trained technicians and of histological training facilities. This problem can best be solved by a policy of exchanging personnel between medical centers and field stations.

DIAGNOSIS: The histologic diagnosis of leprosy depends on demonstration of: (a) acid-fast bacilli, (b) host cells in characteristic circumstances (see classification below) or (c) cellulor infiltrations which selectively invade or surround nerve fibrils. These criteria may be suggestive but not conclusive.

CLASSIFICATION: Histologic study is a tool for intimate inquiry, for clarifying clinical observation, and for exchanging expert opinion by mail. While pathologists do not agree in all their interpretations, there is general agreement on the following criteria for differentiating the several types of leprosy.

1. Tuberculoid lesions are characterized by focal infiltrations of lymphocytic and epithelioid cells. Such foci extend into the sub-epidermal zone of skin. Nerve fibrils may be infiltrated, destroyed or difficult to detect.

2. Lepromatous lesions are characterized by continuous granulomatous infiltrations containing infected histiocytes, VIRCHOW cells and globi. The infiltrations do not extend into the sub-epidermal zone of skin.

3. Between these two polar conditions, the position of the patient in the spectrum of intermediate responses is best defined by the number of bacilli, the preponderance of either VIRCHOW cells or epithelioid cells and lymphocytes, the infiltration of nerve fibrils, and by the degree of involvement of the sub-epidermal zone.

There are several points at which further correlation of knowledge and opinion would be helpful: more frequent exchange of clinical photographs and of sections among histo-pathologists; recognition that the terminologies applied to the clinical scale and the histologic scale do not carry exactly the same meaning when applied to different races; and more frequent study of the histologic response in the lepromin test.

ASSESSMENT OF TREATMENT: The special merit of histologic study in therapeutic research is to distinguish between reduction of lesions and the much slower decreases in the concentrations of bacilli. Combination of these two types of data has resulted in, the proposal of an index which describes the results of therapy more adequately than do bacteriologic indices. Pathologists are urged to seek agreement on the simplest reliable means of deriving such indices.

OTHER LABORATORY TESTS: Various serological and biochemical tests have been under active investigation in recent years. The agglutination of OT-sensitized red blood cells and KAHN's serological reaction have not found a place in the routine assessment of leprosy.

Special problems

Although active leprotic infection is characterized by prediliction for superficial tissues by exceptional incubation periods and by polar patterns of immunologic response, the tendency to damage superficial nerves is unique among infections diseases.

PREDILECTION FOR NERVES: Correlations between the clinical type of lesion, sensory tests and neuro-histologic findings may be summarized as follows. In all forms of leprosy showing manifestation of immune response (i. e., except in diffuse lepromatous infiltrations) the cutaneous sensory nerves are damaged more severely than other elements. The histologic character of the lesions in these nerves corresponds with the lesion seen in the skin they serve. Though bacilli are usually not seen in tuberculoid lesions, the microorganisms in dimorphous lesions showing similar nerve damage are situated as follows: If few, they are confined within the endoneurial sheath, in the myelin sheath near regenerating axons and in the cytoplasm of Schwann cells surrounding empty Schwann tubes. If bacilli are somewhat more abundant, they occur also in cells of the endoneurium but do not occur outside the thickened epineurium. If abundant, the bacilli are scattered throughout the adjacent subcutis but are most concentrated in and around the neural elements.

Hyperpathia and other unpleasant sensations are associated with the presence of isolated regenerating axons bearing obstructed growth cones. The continual damage to nerves is compensated in part by these attempted regenerations and also by invasion of sprouts from adjacent undamaged nerves. Although extension to less distal portions of nerve trunks is common in the neural form of tuberculoid leprosy, functional damage is recognized primarily in nerve tracts which are highly superficial.

THE INITIATION OF DISEASE: As noted above, in dimorphous lesions containing the fewest bacilli, the latter are associated with SCHWANN cells and regenerating axons. This observation suggests that initial proliferation of bacilli in this haven may determine the infection of adjacent structures. An answer is required to the question whether cutaneous nerve branches are always the first structures to harbor M. leprae or whether on the contrary the earliest recognizable infection in some persons may involve other structures. Are these nerves a pabulum for the initiation of infection or are they a haven in which immunological factors exert their influence least effectively?

LEPRA REACTION: These reactions are of 2 types: erythema nodosum leprosum (an exudative reaction around VIRCHOW cells) and reactional states in lesions characteristic of the form of leprosy.

These exacerbations are not attributed to acute episodes of bacterial activity. They are regarded instead as indication of a less tolerant immunologic state. Though these reactional states increase injury in infected nerves, and, if protracted, may cause continuous deterioration in other forms of the disease, they may (in dimorphus leprosy) be followed by dramatic improvement. There is urgent need for surer knowledge of the significance of these reactions.

The members of the Technical Committee on Bacteriology and Pathology propose:

1. That appointment of a Technical Committee solely for the Congress (and at the time of the Congress) is undesirable. It leads to compromise rather than to understanding.

2. (a) That the ILA sponsor a working committee on Bacteriology and Pathology to assess progress in these topics and to report through the ILA at any time which seems desirable. (b) This committee could organize a symposium and or present a report as a part of the program of the VIII Congress, but not officially for the Congress.

3. That during the Congress rooms be available for the informal conduct of round-table discussions as may be desired.

SEVENTH INTERNATIONAL CONGRESS ON LEPROLOGY

TOKYO, JAPAN
(November 12-19, 1958)

REPORT OF THE TECHNICAL COMMITTEE ON EPIDEMIOLOGY AND CONTROL

DR. J. A. DOULL	*(Panel* chairman)
DR. O. DINIZ	*(Panel* member)
DR. R. S. GUINTO	*(" ")*
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DR. J. CONVIT	

The methods of control recommended in this report differ from those adopted by the Sixth Congress in emphasis and direction rather than in substance. Science has added no new weapons to our armamentarium since 1953. Nevertheless, progress is being made. Significant developments in administrative methods promise to increase greatly the efficiency of those measures already at our command.

The first of these developments is the recognition of the outpatient treatment as the principal center for the attack on leprosy, another is the trend towards integration of antileprosy activities with general public health service.

The importance of sulphone therapy as a means of control of leprosy is emphasised; it is recognized, however, that it wil fail unless supported by an effective campaign of case-detection and education.

Vaccination with BCG was recommended by the Sixth Congress for protection of contacts and as a part of "prophylaxis campaigns". At the same time, further studies were advocated to determine its value. Although such studies are under way in several countries, and although some preliminary reports have been published, evidence regarding the value of BCG in the prevention of leprosy is still insufficient to warrant its general use. The recommendation of the Sixth Congress is therefore modified in this report.

EPIDEMIOLOGY

The epidemiology of leprosy is the study of the occurrence and distribution of the disease, in its various forms, at different periods of time and throughout the world. More particularly, it deals with the relationship between the incidence of the disease and climate, housing, diet and other ecological conditions which may affect either exposure to infection or resistance to the disease. The objective of epidemiology is to explain variations in incidence and, by so doing, to indicate control measures which are most likely to be effective.

The following major topics are given special emphasis by the Panel.

1. *PREVALENCE.* The importance of obtaining reliable estimates of prevalence cannot be exaggerated. Only in this way can an adequate basis be provided for direction of the antileprosy campaign and for measurement of its results.

Apart from difficulties of topography and deficiencies in transportation, there are human problems which may interfere with surveys which require

examination of the general population. Objections may be rooted deeply in religious or tribal customs, or they may be based only upon fear of discovery of the disease. A preliminary educational campaign is essential but to ensure its succes the cooperation of civil administrative officials should be sought.

Recognizing that it will not be practicable to sample scientifically in many countries, the committee wishes to encourage the carrying out of more limited surveys such as examination of the population of villages and other units. These examinations should be repeated periodically according to circumstances. In many areas, only these procedures are practicable. Caution is advised in applying the results more generally because one of the peculiarities of leprosy is its concentration in certain localities. Examination of entire populations except under special conditions is unrealistic and estimates must be made in other ways. In certain countries in which prevalence is high it may be practicable to carry out correctly designed sampling surveys at intervals of five to ten years. The fundamentals are to determine the method of selection of the individuals to be examined and the numbers to be included. These questions demand, in every instance, joint planning by leprologists, epidemiologists and statisticians. In this planning all facts which relate to prevalence should be taken into acount such as the numbers of registered cases in different areas and the results of previous surveys of villages or other population groups. If such surveys are feasible, their cost will be repaid many times by greater efficiency of control work. Because of the scarcity of qualified personnel, the World Health Organization could render a great service by making experts available to governments to assist in planning these sampling surveys.

Examination of selected classes or groups, for which good health may be a factor in selection, such as military, police, or employees of various industries, yields very little information which is of value in estimating the prevalence of leprosy in the general population. However, examination of school children may yield useful information.

Leprosy surveys may be combined with those for yaw or other diseases.

2. *EVOLUTION OF THE DISEASE:* The development of leprosy in the individual and changes from one type or form of the disease to another are not primarily the concern of this committee. The frequency of such changes, however, is definitely of epidemiological importance. In fact, the principal reason for the lack of reliable information on this subjects is its neglect by those who have special training in the essential methodology.

Much information concerning clinical and bacteriological changes could be gained by keeping careful records of all cases occurring in an area over a period of years and noting the dates of appearance of dermatological and neurological *signs.* Environmental and social facts associated with these changes should be studied. A modified life table procedure should be used, to take account of gains and losses in numbers and thus to obtain an accurate idea of the rate of change of each form of the disease. Important questions could eventually be answered, such as the frequency of changes from indeterminate to either polar type; from tuberculoid to borderline, and from borderline, in turn, to the definitely lepromatous or tuberculoid type. Also a study of the frequency of recurrence of clinical and bacteriological activity in arrested eases could be included.

3. *RELATIVE INFECTIOUSNESS OF LEPROMATOUS AND TUBERCULOID TYPES:* It is well established that all cases of lepromatous leprosy are bacilliferous and infective; and that, as a rule, cases of the tuberculoid type are not bacilliferous, except during reaction when they may shed large numbers of bacilli.

In parts of the world where the great majority of recognized cases are of the tuberculoid type, a kind of epidemiological enigma has arisen, in that infectiousness of tuberculoid cases seems essentiall for the continuance of the disease. The probable infectiousness of any case, regardless of type, can be

estimated only by the clinical and bacteriological features which are presented on a series of examinations. Family studies are too difficult and too expensive to be carried out in many countries. It is recommended that in areas where the tuberculoid types is greatly in excess, intensive efforts should be made to find the source of every newly recognized case, especially in children.

4. *EVALUATION OF CLINIC TREATMENT.* In many parts of the world, where large numbers of patients are being treated as outpatients, there is opportunity to measure the effectiveness of treatment.

There are three indices which could be used at all dispensaries:

(a) Index of Clinical Effectiveness (clinical arrest and treatment being defined).

$$= \frac{\text{Cases becoming arrested during year}}{\text{Cases treated during year}} \text{ x } 100$$

This index should be calculated separately for different types of leprosy; and, in larger clinics, for age and sex groupings.

(b) Index of Bacteriological Effectiveness (the number of sites being stipulated and negativity being defined).

$$= \frac{\text{Cases becoming bacteriologically negative during year}}{\text{Bacteriologically positive cases treated during year}} \text{ x } 100$$

This index likewise should be calculated separately for each type of the disease, and if desired, for patients on various therapies separately and duration of treatment.

(c) Index of Effectiveness in Case-finding, or Discovery Rate.

$$= \frac{\text{New cases discovered during year}}{\text{population of the area}} \text{ x } 1.000$$

Here, likewise, cases should be classified by type; and cases and population by sex and age group.

The average age on discovery and also the average duration of the disease on discovery should be studied. These will decline progressively with the sueess of the dispensary.

SPECIAL EPIDEMIOLOGICAL PROBLEMS: The Committee draws attention to certain special problems in the hope that they will be studied by governments and other organizations having the necessary staff and facilities.

A. *RELATING TO EFFECTIVENESS OF THERAPY IN TUBERCULOID CASES.* Controlled studies of the effect of sulfones on the tuberculoid type are needed and especially of the value of sulfones in preventing or limiting peripheral nerve damage.

B. *RELATING TO SOURCES OF INFECTION.* Clinical severity in leprosy varies from cases which are severe and malignant to those in which there are only small macules which may remain stationary or even disappear. It may be assumed, on general principles, that there are other infections which may never rise to the level of clinical recognition. Until a method of cultivation of *M. leprae* is available, and its cultural characteristics are known, it will not be possible to identify with certainty these cases of subclinical infection. All that can be done at present is to recognize individuals in whom noncultivable acid-fast bacilli are discovered on biopsy. If these bacilli are actually *M. leprae,* infected

persons should be more frequent among contact of lepromatous patients than in any other group. This readily answerable question remains to be explored.

C. *RELATING TO MODE OF TRANSMISSION*. In recent years the possible role of insects in the transmission of leprosy has been revived. Non-flying insects such as lice, fleas, and bedbugs and itch mites have been suspected from time to time. Although acid-fast bacilli have been found in various insects there are no modern data relating to the cultivability of these bacilli or to their frequency in insects found in association with cases of leprosy as compared to those found in other places.

D. *RELATING TO RESISTANCE*. The most timely question concerning resistance is whether persons who show lepromin reactivity of the MITSUDA type are more resistant to leprosy than those who do not. Leprologists who favor this hypothesis point to the usual reactivity in tuberculoid leprosy and its absence in the lepromatous type, and some state that lepromatous leprosy does not occur in strongly reactive persons. On the other hand, it is conceivable that infection is independent of reactivity to lepromin and that the body loses its capacity to react when an enormous multiplication of bacilli takes place. The question could be answered by long term field studies in which groups differing only in respect to reactivity to lepromin are kept under equally close supervision through that period of life during which attack rates are highest.

The origin of natural reactivity to lepromin warrants the most thorough investigation. Reactivity is frequent in apparently healthy persons both in areas where leprosy exists and in places where the disease is rare or absent. Positive association with hypersensitivity to tuberculin, and the action of BCG vaccination in producing reactivity to lepromin, point to the probability that in some instantes natural reactivity to lepromin may result from infection with *M. tuberculosis.* It has been claimed, however, that this explanation is inadequate and that the true cause of much reactivity to lepromin is unknown. Solution of this problem would throw light on the immunology of leprosy and might contribute to prevention of the disease.

BCG VACCINATION. Several thoughtful plans for study of the effect of BCG vaccination on resistance to leprosy have been published and a few investigators have reported preliminary results. The epidemiological problem which is presented is more difficult that in tuberculosis because of the relatively low incidence of leprosy and the lack of an indicator of subclinical infection such as the tuberculin test.

Because of the widespread BCG campaigns for the prevention of tuberculosis in many countries in which leprosy is prevalent, it is impossible to conduct a thoroughly satisfactory field study in which, for example, alternate infants woul be vaccinated, the others retained as controls and both groups subjected to equal close supervision for a period of years. We must therefore be content to collect evidence of secondary value, such as:

1. A comparison of the annual discovery rate for vaccinated with that for non-vaccinated populations.

By close collaboration with antituberculosis workers it may be possible to make stimates of the numbers of children vaccinated at various times and their ages, and from these estimates to compute the numbers remaining unvaccinated.

2. A comparison of the relative frequency of the lepromatous and tuberculoid types in persons known to have been vaccinated with that in unvaccinated persons of the same sex and age groups. This matter should be studied both for persons exposed in the household and for other persons.

CHIMIOPROPHYLAXIS: The value of sulphon drugs in the prophylaxis of leprosy especially for those intimately exposed, it recommended for study.

DIET. The possible relationship of some pecularity or deficiency of the diet to resistance to leprosy has never been thoroughly explored. This is a complicated and difficult field but could be approached in several countries

where there are striking variations of diet in persons of the same race. These studies will obviously require the combined efforts of nutritionists and epidemiologists.

OTHER FACTORS. There are numerous other factors which may be related to resistance, including debilitating illness, pregnancy, and certain occupations in which there is special liability to injury of the extremities.

CONTROL

Although there is unavoidable overlapping, measures for control may be conveniently grouped under four headings: (1) Educational: (2) Medical; (3) Social; and (4) Legal.

1. Educational measures

The control of leprosy depends upon early detection and early treatment of all cases. The services of a physician skilled in diagnosis should be available and the public should be sufficiently aware of the nature of the disease to request those services suspected signs or symptoms appear.

A second facet of education relates to the patient and his family. If patients are to remain in their homes, it is essential that the mode of infection be explained to those who are most intimately concerned.

It is therefore recommended that in all countries where leprosy is endemic the responsible health authorities should take action to promote educational measures specifically directed to the following groups:

(a) *MEDICAL STUDENTS, PHYSICIANS AND AUXILIARY PERSONNEL.* Clinical and didatic instruction in diagnosis, treatment and prevention of leprosy should be given to medical students as a part of the curriculum; and by means of regularly scheduled postgraduate courses, to general practitioners and health officers. Suitably graded instruction should be provided for nurses, social workers and lay assistants.

(b) *THE PATIENT AND HIS FAMILY.* Emphasis should be placed on the necessity of regular prolonged treatment. The possibility of reactions and other complications should be anticipated. The early signs of the disease should be described and all contacts requested to report for physical examination at a definite time and place. Instruction should be given on personal hygiene and matters relating to transmission. The advantage of removal of young children from the home and their placement with relatives or friends or in an institution for general child care should be explored. Vaccination with BCG should be performed as a *possible* and not as an *assured* means of protection. Finally, if considerable numbers of tablets of DDS are issued to patients, instructions should be given as to their safekeeping, and procedures to be taken in the event of accidental poisoning.

(c) *THE GENERAL PUBLIC.* In all countries where leprosy is endemic the nature of the disease and the steps taken to control it should be explained to the public by the same methods used in the campaign against tuberculosis and other infectious diseases. The cause, mode of transmission, early signs and treatment should be explained. Instruction should be by newspapers, radio and illustrated lectures. Governments should develop illutrative educational material suitable for instruction of the general public. Instruction should be given in schools as a part of a program of health education.

2. Medical measures and facilities

The principal arm of the modern antileprosy campaign is chemotherapy. Although a rapidly effective, bactericidal drug is urgently needed, prolonged sulfone treatment will reduce infectiousness. It follows that if a considerable proportion of bacteriologically positive patients are treated, the disease will

decline. The primary problem therefore becomes largely an administrative one — to reach and to treat patients who are bacteriologically positive and those likely to become positive.

(a) *HEALTH CENTERS, DISPENSARIES AND OTHER FACILITIES FOR OUTPATIENT TREATMENT.* There should be an adequate number of centers, the number and distribution being related to the prevalence of the disease in various regions. Clinics should be so located as to be conveniently accessible to the largest number of patients, and may be housed in general hospitals. If this is not possible, recourse should be had to the mobile clinic, with a regular itinerary. Equipment of clinics should be standardized.

The health center, staffed and equipped for generalized public health services can readily be adapted to carry out all functions essential to the antileprosy program-including treatment, selection of patients for hospitalization, training of personnel, epidemiological investigations and surveys, home nursing and social work. In addition, as noted above, these centers offer an opportunity for study of the effect of treatment upon clinical and bacteriological status in different types and forms of the disease.

(b) *HOSPITALS, LEPROSARIA AND OTHER FACILITIES FOR INPATIENT CARE.* Although outpatient care is stressed, facilities for inpatient care are necessary for patients in reaction, and can play an important part in the control of leprosy. In countries with adequate facilities, as many infectious patients as can be accommodated should be induced to enter leprosaria on a voluntary basis. The period of hospitalization, however, should be only sufficient to effect clinical regression. A prolonged series of negative smears should not be required. From the epidemiological point of view it is *more advantageous to reduce infectiousness in many patients than to eliminate infectiousness in a few.*

The leprosaiinm may also be a center for research, education of professional personnel, special surgery and vocational training of patients.

(c) *MEDICAL SUPERVISION OF CONTACTS.* The extent to which supervision of contacts is practicable varies greatly. In some countries, because of the frequency of leprosy and deficiency of staff and transportation facilities, very little can be done in this direction at the present time. The following procedures are recommended as an objective, ultimately to be attained.

(1) If the case is bacteriologically positive, all household contacts and siblings should be given physical examinations and be advised to report annually thereafter.

(2) If the case is bacteriologically negative, household contacts and siblings should be urged to report for examination. These persons need not be subjected to annual reexamination but should be instructed to apply for examination if suspected signs of leprosy appear.

(3) Contacts may be lepromin tested and young children may be vaccinated with BCG without a preliminary lepromin test.

3. Social measures

Erroneous concepts regarding the disease continue to impose harsh and unjustifiable penalties upon the sufferer from leprosy and his family. The obligation of society to render assistance, therefore, transcends that which is associated with other chronic diseases. Obviously, educational, medical and social measures should go hand in hand. In addition to provision of medical care and drugs, various types of social assistance are directly related to control, viz:

(a) Aid in obtaining transportation to and from clinics.
(b) Financial help for families in which the breadwinner in unable to work.

(c) When advisable, removal of young children from the home and their placement elsewhere.

(d) Aid in preserving family ties when the patient is removed to an *institution*, and other to prevent departure of the hospitalized patient prior to his medical discharge.

4. Legal measures

Legal restrictions on patients have limited value in the control of leprosy. They drive many into hiding and can be effectively applied only to a few. Reporting of the disease to the health department, however, is a necessity and should be required on the part of physicians and others having knowledge of the existence of leprosy.

Indiscriminate compulsory segregation is an anachronism and should be abolished. Discretionary authority should be given to the health officer to require isolation in those *instances* in which the patient is discharging leprosy bacilli and in which sulfone therapy is neglected or ineffective and young children are exposed in the home.

On the international level, the right of national government to refuse entry to their territories of persons suffering from leprosy is recongnized. On the other hand, repatriation of an individual who develops leprosy after a long period of residence in a foreign country may cause hardship and neglect of treatment. This problem might be referred to the World Health Organization with the suggestion that governments be asked to give to such individuals the same opportunity for treatment as is offered to their own citizens.

SUMMARY OF RECOMMENDATIONS

1. The importance of obtaining reliable estimates of prevalence is stressed. These are essential for proper direction of the anti-leprosy campaign for measurement of its results. Adequate sampling surveys should be made wherever these are practicable and it is suggested that expert assistance in planning such surveys might be made available to governments by the World Health Organization.

2. There is particular need for epidemiological study of such subjects as the infectiousness of the tuberculoid type; the frequency of change in form or type and especially of the change indeterminate and borderline forms to the lepromatous; the frequency of relapse, and the value of outpatient treatment *in reducing* infectiousness.

3. The tremendous increase in outpatient treatment in many countries has brought sharply into view the urgent necessity of vigorous educational efforts, directed towards professional groups, the patient and his family, and the general public. The basis of all education should be the concept of leprosy as an infectious disease which can be successfully treated and controlled.

4. There should be an adequate number of facilities for outpatient treatment. Clinics should be so located as to be conveniently accessible to the largest number of patients and may be housed in general hospital. If this is not possible mobile clinics should be used.

5. The continued and closer integration of antileprosy activities with general public health services is advocated, in the belief that this will bring greater efficiency of operations and make more readily available to leprosy patients various specialized services which are now deficient.

6. The leprosarium can play an important role in the control program by providing facilities for treatment of patients in reaction and of infectious patients admitted on a voluntary basis. It is valuable as a center for research, education of professional *personnel*, special surgery and vocational training of patients.

7. All household contacts of bacteriologically positive patients, and sibling whether or not resident in the household, should be given physical examination upon discovery of the case, and advised to report annually thereafter.

8. Removal of infants and young children from contact with bacteriologically positive patients is recommended. Efforts should be made to place these children with relatives of friends. Failing this they may be placed in institutions for general child care. In some countries, special preventoria are in operation; whenever possible, these should be converted into general childcare institutions.

9. Although the value of BCG as a preventive measure in leprosy has not been established, the possibility exist; young children who are exposed to bacteriologically positive patients in the household should therefore be vaccinated.

10. Various types of social assistance are essential to the control of leprosy, including financial help for families when the breadwinner is hospitalized or unable to work; aid in transporting patients to clinics; satisfactory placement of children who should be removed from contact, and aid in preserving family ties when the patient is hospitalized.

11. Reporting of leprosy to the health department is and essential legal requirement on the part of the physicians and others having knowledge of the existence of leprosy.

12. Compulsory isolation should be abolished, but the health officer should have discretionary power to require institutional isolation in those instances in which the patient is discharging leprosy bacilli and satisfactory conditions for isolation cannot otherwise be maintained.

13. The right of national governments to refuse entry to their territories of persons suffering from leprosy is recognized. Repatriation of individuals who develop leprosy after a long period of residence in a foreign country may result in serious interruption of treatment. It is recommended that this problem be referred to the World Health Organization with the suggestion that governments be asked to give such individuals the same opportunity for treatment as is offered to their own citizens.

SEVENTH INTERNATIONAL CONGRESS ON LEPROSY

TOKYO, JAPAN
(November 12-19, 1958)

REPORT OF THE TECHNICAL COMMITTEE ON IMMUNOLOGY

DR. F. M. M. FERNANDEZ	(Panel chairman)
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DR. H. W. WADE	(“ “)
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THE LEPROMIN REACTION

The use of the lepromin reaction as an index of the degree of resistance to *Mycobacterium leprae* is constantly increasing. It offers a useful element in the respect to prognosis and classification of cases of leprosy, and consequently its use in practice is recommended.

Antigens which contain bacillary bodies (e. *g.*, the MITSUDA-HAYASHI antigen) can themselves modify the immunological state of the body and provoke positive reactions even in subjects who have not been in previous contact with *M. leprae* or *M. tuberculosis.*

ANTIGENS. For the preparation of lepromin it is recommended the method which fulfills most closely the following requirements (a) maximal possible utilization of the bacillary element of the material used, and (b) the greatest simplicity of preparation. It is much to be desired that a method be devised whereby lepromin may be standardized.

The method of DHARMENDRA gives an antigen which can be standardized with minimal loss of bacilli. On the other hand, the late reaction with this antigen is weaker than with the original lepromin, presumably because the chloroform and ether employed in its preparation modify the composition of the bacilli.

Methods such as that of FERNANDEZ and OLMOS CASTRO give standardized antigens with bacilli very little changed in their composition "purified bacillus suspensions". The one mentioned has the disadvantage that a great many bacilli are wasted in its preparation. Others which have been made have shown no advantage over regular lepromin, and they *give* weaker reactions. The MITSUDA-HAYASHI method, in spite of the fact that it gives a cruder antigen which has not yet been standardized, is most widely used because of the simplicity of its preparation and its practical efficacy.

With these considerations in mind, the MITSUDA-HAYASHI antigen as modified by WADE is recommended as preferable for routine work. Investigations should be continued on the preparation of other forms of skin-test antigens of this type.

Studies should be continued to determine the feasibility of employing dilutions of lepromin in testing the reactivity of patients and contacts and in field surveys.

Certain workers have devised methods of preparing solutions of leprosy-bacillus constituents freed from elements, for eliciting the early or FERNANDEZ reaction. The utility of such preparations in practical work should be established. Incidentally, because of the analogy to tuberculin, it is recommended that such antigens be called leprolins (suffix-/in), in distinction from lepromins,

prepared from whole lepromas *(-min).*

Finally, it is recommended that some central laboratory prepare a standard lepromin, samples of which could, on request, be supplied to workers elsewhere for comparison with their own preparations. Such a standard should be made in a large quantity, and freeze-dried to prevent deterioration. The solvent should be plain saline, not phenolsaline, to avoid concentration of phenol which might be injurious; the reeepient would reconstitute the suspension by adding the proper amount of 0.5 per cent phenol in distilled water.

READING OF THE LEPROMIN REACTIONS

The intradermal injection of lepromin commonly provokes, in persons who react positively, a double response: (a) an early reaction in 24 to 48 hours — the reaction of FERNANDEZ; *(b)* a delayed reaction read after three to four weeks — the reaction of MITSUDA. Either reaction may occur without the other, especially the late reaction in young healthy children.

The early reaction — The early reaction when positive reflects pre-existing state of hipersensivity to the constituents of the leprosy bacillus.

It consists of an erythematous-edematous lesion, sometimes evident twelve hours after the injection, the aspect and evolution of which resemble the reactions of the tuberculin type. It reaches its maximum after 24 to 48 hours, and ordinarily begins to diminish after 72 hours. In strongly positive cases

it persists for a longer time in the form of a dark halo surrounding the late nodule.

In the reading of the early reaction the element of importance is the edema. Reactions which present only erythema should be considered doubtful or negative, and also reactions which appear very early and regress or disappear before 48 hours. A sharp margin of ameboid configuration is peculiar to very strong positive reactions.

It is recommended that the results of this reaction be read after 48 hours, conforming to the following criteria:

Negative (—): Absence of reaction, or erythema without edema, or erythema with edema measuring less than 5 mm in diameter.

Doubtful (±): An erythematous-edematous reaction meassuring 5 mm or more but less than 10 mm in diameter.

Weak positive (+): An erythematous-edematous reaction measuring 10 mm or more but less than 15 mm in diameter.

Moderate positive (++): An erythematous-edematous reaction measuring 15 mm or more but less than 20 mm in diameter.

Strong positive (+++): An erythematous-edematous reaction measuring 20 mm or more in diameter.

THE LATE REACTION. This reaction consists of a nodular induration which usually begins after the first week following the injection, ordinarily reaches maximum about the third or fourth week, and later regresses, frequently leaving atrophy or a scar. Intensely strong reactions may result in ulceration. Sometimes the evolution is accelerated and reaches its peak before the third week, while at other times it is delayed, reaching its peak after the fourth week. *In* negative or doubtful cases it may be well to make later readings up to 60 days.

The criterion of reading should be based not only on the size of the induration, but also on its appearance and evolution.

Negative (—): Absence of any local reaction.

Doubtful (±): Induration less than 3 mm in diameter.

Weak positive (+): Frank induration between 3 and 5 mm inclusive, in diameter.

Moderate positive (++): Nodular induration larger than 5 mm in diameter.

Strong positive (+++): When the induration undergoes ulceration.

For clinical records and in reporting research work the actual measurements in millimeters of reaction lesions should be recorded. When the lesions are not round two measurements should be made and averaged.

It is recommended that histologic studies of the late reaction be pursued to determine whether or not those limits agree with biologic factors.

INTERPRETATION OF THE RESULTS

A positive reaction to lepromin is regarded as an expression of a certain amount of resistance to *Mycobacterium leprae,* directly proportionate to the degree of positivity.

A negative reaction is interpreted as follows:

(a) In patients with leprosy, and contacts living with open bases, it is generally regarded as a sign of deficient resistance.

(b) In healthy individuals not contaminated with leprosy, it is not a sign of deficient resistance unless negativity persists on repeated testing.

B. C. G. and the Lepromin Reaction

There has been much interest in recent years in the possibility of converting lepromin negative persons to positive reactors by B. C. G. vaccination, it being hoped that positivity thus induced will enhance resistance to leprosy infection.

If this should be so, this measure would have an important influence in the control of leprosy.

Up to the present time there has been lack of agreement in the results of observations that have been reported. Some workers believe that B. C. G. is effective in converting lepromin negatives to positives, while others are not satisfied that this has been adequately proved. While there have been some favorable reports, there has not yet been time for sufficient observations to prove beyond doubt that B. C. G. vaccination is actually protective.

It is probable that the lack of agreement regarding the effectiveness of B. C. G. in converting the lepromin reaction is in large part due to unsystematic experiments, often without adequate control. Another factor may be that different methods of employing B. C. G. will not necessarily give the same results. Finally, when fresh B. C. G. suspensions are used they may vary more or less widely in potency because of ageing.

It is therefore recommended that experiments on this matter be well planned, with the aid of statisticians. It would be highly desirable if a standard experiment could be worked out which be applied in various countries.

With respect to controls, it should be borne in mind that preliminary lepromin testing affects the immunological state of the subjects of the experiment, as tuberculin testing does not. Preliminary tuberculin testing is necessary in order to select tuberculin negatives for the experiment if B. C. G. is to be given intradermally, to avoid unduly severe skin reactions to the vaccine. Preliminary testing with lepromin, on the other hand, is not necessary. With two comparable groups of subjects, B. C. G. may be given to one, with lepromin testing afterward, but the controls would be tested with lepromin only once, to establish the rate of "natural" lepromin reactivity of the population employed.

To avoid variability of potency of the B. C. G., it is recommended that the use of a reliable dried vaccine be considered in standardized experiments.

(Dr. KEN YANAGISAWA, of the National Institute of Health in Tokyo, has offered to supply experimenters with dried B. C. G. which retains full potency for one year in refrigeration, or three months at room temperature.)

SEVENTH INTERNATIONAL CONGRESS ON LEPROLOGY

TOKYO, JAPAN

(November 12-19, 1958)

REPORT OF THE TECHNICAL COMMITTEE ON SOCIAL ASPECTS OF LEPROSY

MR. T. N. JAGADISAN	(Panel chairman)
DR. F. CONTRERAS	(Panel member)
DR. F. HEMERIJCKX	(“ “)
MR. R. FOLLEREAU	(“ “)
MR. A. D. MILLER	(“ “)
DR. R. OZAWA	
MRS. E. WEAVER	

The increasing hopefulness of medical treatment for leprosy and its consequences greatly enlarges the range of the social aspects of disease. Until modern treatment became available social action, whether right or wrong, outstripped medical attention. Today, medical advances will yield their full

advantages only where there are parallel advances in social attitudes. Should these lag behind, then the great gains achieved by patient research will be grievously diminished in their practical effect. There is therefore urgent need to emphasize the increased social obligations and opportunities which arise both for the community and the individual sufferer from leprosy at this present time. Far from medical advance reducing social responsibility it affords a fresh challenge to engage in constructive activities to match and take advantage of them.

In general the Resolutions of the Madrid Congress of *1953* upon Social Aspects of Leprosy are endorsed, but the more recent advances in medical and orthopaedic work necessitate fresh emphases and in some cases new approaches, in order to exploit these gains.

Right Social Attitudes

Right social action must be based on rational attitudes. Now that our understanding of leprosy shows it to be a disease capable both of prevention and cure, and also one which is among the least contagious of communicable diseases, the effort of communities faced with leprosy as a social problem should be similar to that which it makes in relation to other diseases. Leprosy is only one disease among others, and should not be regarded differently. Our chief aim should be to destroy the notion that leprosy is a disease apart, always requiring specialized services. For the ultimate solution of the social problems of leprosy the general social worker must become more and more interested, and such welfare services as are open for others should be made available to leprosy patients and their children, consistent with public health considerations.

Early Diagnosis and Treatment

A first principle of social action must be to make early diagnosis and treatment available on the widest scale consistent with efficient work. No sufferer should be debarred from the right to avail himself of proper medical attention. There is therefore need to urge the private practitioner and public health authorities to make treatment available at the earliest possible stage of the disease. In areas of high endeminity and low economic standards the establishment of mass units is an obligation of public health authorities. No patient should need to await the stage when he is deformed, or the disease highly active, before he feels that anything can, or should, be done about his care. In such areas public authorities may act in useful cooperation with social agencies, but the ultimate responsability for action must rest upon government and upon the patients themselves. Once early diagnosis has been achieved it should be urged upon the sufferer that it is his duty to cooperate in receiving the regular treatment made available. It does not yet appear to have been sufficiently emphasized — with certain notable exceptions — that the early patient has a duty to the community in cooperating with the efforts made on his behalf.

Preventive Work (a) At Home

Side by side with diagnosis and treatment while the patient lives at home there should be the development of preventive work through proper teaching as to means of protection, where protective action is required.

This teaching may be conveyed in a variety of ways, but always requires psychological understanding of the people concerned, so that enlightened co-operation is received, and no barrier of resistance built up. Simple teaching in all schools will be useful for the future, and should be undertaken through

Education Departments themselves being properly informed. But village education must come nearer the home than the school. Intensive education of the public, patients and their relatives should be undertaken side by side with mass treatment work.

(b) The Children

Every effort should be made to keep children of leprosy sufferers in their own normal surroundings, but in cases where they find themselves cut off from their parents or relatives because they are receiving hospital care, they may need to be provided for. In such circumstances there is a social obligation to save these children not only from leprosy but also from any form of institutional living which might be wounding to their own self-respect. While therefore there are likely to be situations where good home care by a willing relation is not possible, everything possible should be done to give the child a good start in life. Sometimes special preventoria are so well run that no stigma is attached to the children in them; but where there is any danger of this it should be the aim to place children in general boarding schools or kindergartens. What is essential is that they should not be treated as children who are in any way different from others.

Institutions

It is recommended that were Governments still enforce a Policy of compulsory segregation, this should be totally abandoned. In special cases sanatoria and hospitals, when they keep abreast with present medical knowledge, still have their usefulness, but they should be placed on a voluntary basis, and should be organized so that they prepare patients for rehabilitation as soon as possible.

In every such institution it is most important to maintain the patients' self-respect by encouraging him to become a partner in the activities of the establishment and to engage in gainful and therapeutically useful occupations.

Where economic want on the part of badly disabled patients necessitates residential provision, social assistance should be provided in such a way that it provides as active and happy a life as possible within the limits imposed by the consequences of the disease.

Legislation

Where special leprosy legislation is in force, based on a mistaken understanding of the disease, there is great need to urge governments to repeal this legislation and use the normal procedures of public health regulations which apply in the case of other diseases over notification, though because public prejudice still persists such notification should be confidential. There may in certain instances even be need to protect the leprosy sufferer by law from discriminatory action.

Rehabilitation

The advances made in ortopaedics have made it possible for many patients hitherto regarded as chronic cripples to be trained for gainful employment in suitable occupations, provided proper attention is paid to the care of hands and feet. Such patients and ex-patients have an obligation to cooperate but they will require social assistance in training, employment and other care. All agencies which can help, whether governmental, commercial or social, are challenged by this changed situation to render the help they can give. Specially trained recovered patients can be used in after-care programmes, this step itself serving as a means of rehabilitation.

Together with rehabilitation there should be more attention paid to the prevention of deformity. Emphasis on this will reduce a continuation of its problems, and mass treatment units in endemic areas should make this an integral part of their work.

In all this work psychological rehabilitation must not be forgotten, and consequently every endeavour must be made to restore patients to the normal life of the community. It is most important that healed patients should live in normal home conditions rather than form separate groups, and it is an obligation of the community to receive them in a friendly way.

Education

As effective leprosy work is often best engaged in where general publicity is minimized, this makes proper education of the public all the more imperative. Medical students in particular should receive instruction in the social aspects of leprosy as well as in the medical ones. Moreover the responsability of more favoured peoples towards the less, and of governments and the medical profession to act constructively where leprosy presents a problem, must be strongly emphasized and it is hoped that the Council of the International Leprosy Association may be able to prepare a considered statement for the attention of governments and public bodies concerned. The authority of such a statement upon the social responsabilities created by our present knowledge of leprosy and the measures required both by patients and the public would carry powerful weight and should stimulate national-wise and energetic action.

SESSÃO SOLENE COMEMORATIVA DO JUBILEU DE PRATA DA SOCIEDADE PAULISTA DE LEPROLOGIA

DISCURSO DO DR. JOÃO BAPTISTA RISI, PRESIDENTE DA ASSOCIAÇÃO BRASILEIRA DE LEPROLOGIA

Sr. Presidente,
Sr. Diretor do Serviço Nacional de Lepra,
Sr. Diretor do Departamento de Profilaxia da Lepra de São Paulo,
Srs. Professôres,
Meus preclaros Colegas

Foi dito, aqui, há poucos instantes, que o acontecimento se verificou num dia de agôsto de 1933... Talvez fôsse num dêstes dias de inspiração, em que as nossas almas se sentem revigoradas, saturadas de coragem, decisão e de fé nos seus próprios anseios.

Neste dia, um grupo de entusiastas se congregou para, com a sua coragem, sua decisão e sua fé, lançar a semente de uma das mais úteis instituições, de natureza médica, concretizadas na nossa pátria: a Sociedade Paulista de Leprologia.

Talvez não avaliasse, aquêle pugilo de cinco médicos e três doutorandos, o vulto do tentame. Possivelmente, não imaginasse, também, naquele momento, a projeção que teria a iniciativa, nem qual o seu significado sôbre os rumos da leprologia.

De início singelo, — como sóe acontecer com todos os grandes cometimentos, circunscrito a uma dependência do Sanatório Padre Bento, a novel entidade, tal como o foi a boa semente caída em terreno úbere, germinou com todo o vigor. Desenvolveu-se. Foi adquirindo corpo. Não tardou em transformar-se numa sociedade organizada, ativa, em precoce maturação científica. Seus componentes, em breve, constituíam um quadro engrandecido, em número e em qualidade, de trabalhadores operosos que se arremessaram, num esfôrço inaudito, para construirem um dos mais notáveis monumentos da literatura especializada, — *MONUMENTUM AERE PERENIUS* — a Revista de Leprologia de São Paulo, órgão oficial da Sociedade; mais tarde convertida na Revista Brasileira de Leprologia, órgão oficial de tôdas as sociedades de leprologia em funcionamento no país e das que viessem a organizar-se.

Diletos Colegas.

Seria demasia exaltar o que representou para a leprologia, na nossa terra, esta Sociedade, que hoje vê transcorrer seu 25.º Aniversário de fundação. Direi, apenas, e certo de que não incorro em exagêro, que ela representa um marco erigido no campo da leprologia nacional. Indica o início de uma nova fase de trabalho apoiada no estudo, e, conseqüentemente, na severidade científica. Assinala o início de uma etapa de atividade calçada no debate técnico, na ideiação de grupo, característica de que não pode prescindir qualquer emprêsa incumbida do interêsse público. Foram magníficos os frutos da iniciativa... A Sociedade Paulista de Leprologia tornou-se a tribuna de debates sôbre matéria prática e doutrinária e, por isto mesmo, polarizou a atenção e o interêsse de

todos os leprólogos. Ela evidenciou a necessidade do trabalho organizado, na base do esfôrço coletivo. Rasgou novos horizontes, que permitiram melhor visão dos problemas em exame. Aguçou a perspicácia da clínica da lepra. E, principalmente, trouxe a emulação que possibilitou constituir uma equipe técnica aguerrida contra os preconceitos; inconformada com certos postulados tidos como intangíveis e sempre apta para exercer sua influência benéfica no sentido da renovação das idéias.

A probidade do seu esfôrço e seu alto mérito científico fizeram éco além das fronteiras do Estado e, daí, os círculos especializados do nosso país e do exterior tiveram de acompanhar, com a maior atenção, todos os seus movimentos.

Larga messe de resultados advieram nestes 25 anos de existência. Citarei, ùnicamente, um, embora já tenha aludido: a atual Revista Brasileira de Leprologia, — *MONUMENTUM AERE PERENIUS* — um dos tesouros da literatura especializada; repositório de trabalhos magníficos, e muitos dos quais de colaboradores que já não estão mais no nosso convívio.

É com orgulho que exibimos nas prateleiras da nossa biblioteca seus 25 volumes, da série anual, e mais 5 volumes especiais. Todos os que desejam palmilhar pelos dúbios caminhos da leprologia, terão, forçosamente, que manuseá-los, pois que eles são, não apenas fonte de ilustração, mas de inspiração, pelas lições que nos ministram e pela experiência que nos transmitem.

Sr. Presidente da Sociedade Paulista de Leprologia.

É-nos difícil exprimir nossa admiração pelo acervo de trabalho desenvolvido pela Sociedade Paulista de Leprologia durante êstes 25 anos de atividade, bem como falar da emoção com que todos os leprólogos brasileiros assistem o transcurso desta efeméride. É, também, com a maior reverência que aplaudimos os nomes de seus fundadores, e os mencionamos: LAURO SOUZA LIMA, NELSON SOUZA CAMPOS, JOSÉ DE ALCÂNTARA MADEIRA, FLAVIO MAURANO e HUGO GUIDA; mais os doutorandos LUIS BAPTISTA e ABRAHÂO ROTBERG.

Um nome foi omitido... Sim, o do então doutorando JOSÉ MENDONÇA DE BARROS, e este, infelizmente, já está envolto em crepe. Ante sua memória, curvamo-nos recolhidos, num preito de profunda saudade; saudade que abrange todos aqueles excelentes colaboradores, propulsores desta Sociedade e que já não participam da nossa companhia.

Muitos nomes, Sr. Presidente, deveriam ser exaltados neste instante, mas o tempo urge, e mesmo vacilo, ante o receio de cair em qualquer omissão injusta. Envolvo-os, porém, a todos num largo amplexo que trago da Associação Brasileira de Leprologia para a Sociedade Paulista, com o nosso efusivo cumprimento e no desejo de estimular todos os seus componentes, a fim de que perseverem na mesma linha traçada desde o início. Envolve, ainda, este amplexo os nossos diletos Consócios das Sociedades aqui presentes: da Sociedade Mineira de Leprologia e da Sociedade Paranaense de Leprologia.

Essa é a mensagem, Sr. presidente, que a Associação Brasileira de Leprologia transmite, através da minha modesta palavra, no ensejo dêste significativo evento.