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BOOK REVIEWS

A Guide to Leprosy Control. Geneva: World Health Organization, 1980, 97 pp. Price: Sw. fr. 15.-.

There are more than 3,500,000 registered cases of leprosy in the world today, and it is estimated that there are at least twice as many more that have not been detected. From the point of view of its incidence and prevalence, therefore, leprosy is an important disease and the problem of its control a major one. The age-old prejudice that has caused sufferers from leprosy to be shunned adds greatly to the problem of its detection and control, and the difficulties are exacerbated by its chronicity. Furthermore, for some forms of the disease, there exists at present the uncertainty whether, even after long periods of treatment, freedom from infection will ultimately be obtained.

The World Health Organization turned its attention to leprosy at an early stage in its history. It produced a guide to leprosy control in 1959 that was brought up to date in 1960 and 1966. That guide was never published but was circulated among and utilized by Member States of WHO, UNICEF, voluntary organizations concerned with leprosy, and the staff of WHO itself. Important changes have taken place since it was first issued, both in basic knowledge of the disease and in the approach to leprosy control programs within the context of national health programs. The text has therefore now been thoroughly revised and published for a wider public. It incorporates as far as possible the latest advances in knowledge and the principles and policies recommended by successive international conferences on leprosy and WHO expert committees and other groups.

The opening sections of the guide present the general leprosy situation in the world and discuss its human, social, and economic implications and its epidemiology. These are followed by a discussion of the diagnosis and the classification of leprosy, the Madrid and the Ridley and Jopling classifications being presented in detail. A comprehensive section on treatment deals with general problems of long-term therapy, the review and assessment of progress during treatment, the duration of treatment, and the treatment of reactions and of eye, nerve, hand, and foot lesions. On the subject of prophylaxis the guide is necessarily briefer since it will be at least 10 years before the efficacy of a specific vaccine, being developed at present, can be established in the field; however, the role of BCG vaccine and the chemoprophylactic use of dapsone are considered.

The closing sections of the guide deal with technical policy and the organization of control measures. Medical measures are considered under the headings of case-finding, outpatient and inpatient care, the protection of the healthy population with special reference to contacts and children, and rehabilitation. Attention is also given to health education, social and legal measures to help leprosy patients, training of medical personnel, and management of control programs.

Because the available information on the leprosy problem in the majority of countries is poor or unsatisfactory, WHO, the School of Public Health, Louvain University, Brussels (Belgium), and voluntary organizations have devised a set of three forms for the collection, recording, and reporting of data; properly used, these yield the clinical, operational, and epidemiological information needed for control of the disease whether or not the leprosy control services are integrated into the general health services. The forms and instructions on their use are given in an annex. Other annexes deal with the preparation of standard integral lepromin, clinical and bacteriological examination techniques, drug combinations at present under trial for chemotherapy, the control of sulfone intake by urine tests, and the classification of disabilities. A full index completes the guide.

It is hoped that this guide will contribute to the coordination of efforts to control leprosy and assist those who are responsible for funding, planning, and operating leprosy control programs. Its objective will have been attained if it simplifies the task of

health personnel, eases the lot of leprosy patients, and helps to prevent new infections from arising.

The guide has been prepared by members of the Leprosy unit at WHO and by Dr. K. S. Seal, former Assistant Director of Health Services, WHO Regional Office for Southeast Asia. Acknowledgement is made of the work of the WHO Expert Committee on Leprosy and the various international leprosy congresses.—(*Review material* provided by WHO)

Freerksen, E. and Rosenfeld, M. *Leprosy—Tuberculosis Eradication.* Amsterdam: Excerpta Medica, 1980, 53 pp.

This presentation is not a textbook on leprosy or tuberculosis. It is intended for colleagues who, knowing both diseases, are familiar with the current methods of investigation and want to make use of the modern possibilities available for eradication programs. We have therefore refrained from discussing questions which are of no practical importance or which are self-evident for experts. An attempt has, however, been made to present the scientific background against which present-day eradication programs should be conducted. This is above all necessary in the case of leprosy, whose picture has changed considerably under the impact of developments in microbiology, immunology, and chemotherapy. The subject has been presented so simply that even non-medical assistants (paramedical workers) can understand and make use of it without difficulty.

Eradication programs are based exclusively upon the use of highly effective, well-tolerated, short-term outpatient chemotherapy, which integrates individual treatment with epidemiological requirements.

For the time being, our recommendations as to the best treatment modality are therefore not limited to application in eradication programs but are equally suitable for the treatment of individuals. We dissociate ourselves on purpose from the view widely held among those involved in tuberculosis that the highly developed treatment regimen which is available is too expensive and too complicated for the so-called "third and fourth world" countries, which must therefore content themselves with simpler methods. It is not clear why one should treat a patient with an expensive technique which is by no means always in his interest if he can be helped more quickly and effectively by simpler means.

With any eradication program it is essential to work out first the organizational setup to be used, whose basic principles are the same everywhere but differ in detail from country to country and require careful working out in advance. Flexibility in adjusting to special situations is essential. Forms of behavior are determined by religion, culture, and tradition and an oversimplified rationalistic point of view can be counterproductive.

Leprosy eradication is not to be confused with leprosy control. The objective of the latter is to combat leprosy world-wide. Eradication, on the other hand, is precisely planned for and carried out in well-defined local areas. In so far as leprosy is not to be limited to record keeping, and if, as hitherto, therapy is to be part of the control, one cannot simply retain the procedure of dapsone monotherapy.

The list of references contains a short selection of those papers which provide an overview of the current level of knowledge in the areas considered and the sources quoted point to further literature.—(*Adapted from* authors' preface)

Grange, J. M. *Mycobacterial Diseases.* Current Topics in Infection Series, No. 1. London: Edward Arnold, 1980, 115 pp. Price: £9.75.

The genus *Mycobacterium* is responsible for more misery and suffering than any other genus of bacteria. Leprosy and tuberculosis are well known diseases which have afflicted mankind for many centuries yet misconceptions of the nature of these infections continue to add to the miseries of those who suffer from them. In recent decades the mycobacteria have also been found to cause a number of other specific and non-specific infections, which, although relatively uncommon, are able to cause severe crippling or death of the patient.

This book provides a review of the clinical and laboratory studies that have led to

our present day understanding of the nature of the mycobacteria and the ways in which they interact with their hosts to cause disease. Particular emphasis is placed on immunology as it is the nature of the host's response to infection that determines the histological and clinical manifestations as well as the eventual outcome of the disease.

Chemotherapy is the bedrock of the modern treatment of mycobacterial disease, and a separate chapter is devoted to this subject. The many other aspects of the management of the diseases in the community and in the individual patient are summarized in the chapters devoted to leprosy, tuberculosis, and the other mycobacterial infections.

This monograph is intended for both undergraduate and postgraduate students seeking a general account of the mycobacterial diseases, for the clinician wishing to understand the mechanisms involved in the pathogenesis of the diseases, and for the microbiologist providing a clinical service. The potential researcher will find an account of the fascinating and exciting recent developments in mycobacteriology. More important, perhaps, he will be made aware of the unfortunate gaps in our present day knowledge! A book of this size cannot be comprehensive; consequently, references are given to original papers, review articles, and textbooks.—Author's Preface

Dr. Grange makes a number of points of particular interest to leprologists. The introduction contains the interesting point that leprosy, although often referred to as an ancient disease, is in fact "a relative newcomer to the ills that beset mankind." While no definite evidence of leprosy exists before about 500 B.C., definite signs of tuberculosis have been found in remains of Neolithic men and pre-Colombian Indians in South America dating back to 25,000 years ago. In a general discussion of the genus *Mycobacterium*, *M. lepraemurium* and *M. paratuberculosis* are considered to be sub-specific variants of *M. avium*. The interesting point is made that by far most mycobacteria are environmental saprophytes. The pathogenic variants of *M. fortuitum*, for example, appear to be variants which have arisen by devolution from a genetically complete progenitor type. The speculation is made that since *M. leprae* only recently has afflicted mankind, it must have come from either an animal source or the environment. If no animal source can be identified, then the environment is most likely. This implies that *M. leprae* itself must be able to multiply in some environmental condition, in which case the environment may be a potential source of infection or that *M. leprae* is derived from a culturable progenitor, in which case it should be possible to isolate the progenitor in culture. Four possible reasons for the failure of *M. leprae* to be cultivated *in vitro* are listed: a) an essential food factor is required; b) a critical combination of microenvironmental factors such as pH and redox potential is necessary; c) the living host cell provides some metabolic activity that *M. leprae* lacks; and d) *M. leprae* replicates in some unusual fashion, possibly as a cell-wall-free form.

In discussing the epidemiology of leprosy, Dr. Grange feels that *M. leprae* is not usually shed from skin and that it now seems likely that they are discharged from the body, mainly from the nose, pointing out that a patient with lepromatous leprosy may discharge up to 10^8 organisms daily, a quantity of bacteria analogous to that discharged in the sputum of a patient with open tuberculosis. After discussing the relative frequency of subclinical infection with *M. leprae*, two possibilities are considered likely factors to determine whether or not an infected person will develop overt leprosy and, if so, what type of disease. First, the immune response may be genetically determined, and second, the response may be related to previous experience of the individual with environmental mycobacteria. Dr. Grange favors the latter and feels the most likely successful vaccine candidates to be environmental mycobacteria capable of inducing a protective immune response against *M. leprae*. Two such mycobacteria of interest in this regard are *M. vaccae* and *M. nonchromogenicum*.—RCH

Hargrave, J. C. and Jones, E. R. *Leprosy in Tropical Australia.* A Short Guide for Field Staff in the Diagnosis, Treatment and Management of Leprosy. Darwin, Australia: Northern Territory Medical Service, 1980, 59 pp.

A brief introduction on leprosy in Australia and the conclusion are the only parts of this booklet that deal exclusively with leprosy in that country. The rest of this work is a compact but comprehensive, well-illustrated work that can be useful to anyone from novice to expert working in any field of leprosy. Practically all aspects of leprosy are covered including diagnosis, different types of leprosy, management of each type, taking skin smears and biopsies, treatment, reactive states, and leprosy control. Interspersed throughout the booklet are beautiful, colored illustrations (54 colored plates in all); this includes a section at the end of text containing seven pages of plates illustrating various disease states that could be confused with leprosy.

The authors demonstrate vast knowledge and personal experience with the disease in their ability to condense and simplify the subject. For example, their section on "Cardinal Points in Diagnosis" should make field workers feel competent in diagnosing leprosy by following these guidelines. Even without the printed text, this would be an excellent booklet because of its splendid illustrations.

Some leprosy workers may not necessarily agree with everything in the text, especially using rifampin in all types of leprosy. Stopping dapsone (DDS) in some reactional states is not recommended by most authorities, and in our experience in the United States we rarely encounter exfoliative dermatitis as a complication of dapsone therapy.

Although the authors' experience is Australian, this booklet may fill a gap elsewhere and be used by physicians in the field as well as students and field workers.—B. H. Clements

Leiker, D. L. *Leprosy in the Dark Skin.* Amsterdam: MEDDIA, Royal Tropical Institute, 1980.

Dr. Leiker has prepared a masterful presentation of the bacteriology, epidemiology, diagnosis, classification, leprosy reactions, chemotherapy, complications, differential diagnosis, and control of leprosy. The microfiche version available for review was surprisingly clear; the handviewer provided with this format was a bit awkward at first but functioned quite well after the viewer became accustomed to it.

The examples of skin lesions used to illustrate the classification of the disease are excellent and of considerable value to leprosy workers accustomed to dealing with light skinned patients. The explanations are clear and to the point. As might be expected, emphasis is placed on tuberculoid and borderline cases since these are the most common lesions encountered in dark skinned patients. Leprosy reactions are mentioned only briefly (three illustrations on reversal reaction and two on ENL). Four illustrations describe the grades of hand disability. Fourteen illustrations deal with the important topic of differential diagnosis in an outstanding fashion.

The cost (US$10.00 for microfiche plus US$2.00 for individual handviewer, and US$17.00 for the 35 mm unmounted slides) appears quite reasonable.

Dr. Leiker and his colleagues are to be congratulated on this effort. The series should prove extremely valuable wherever leprosy is being taught.—RCH

National Leprosy Organisation India. (*Diary*). Hindinagar, Wardha-442 103 Maharastra, India: National Leprosy Organisation, 1981.

The National Leprosy Organisation has continued its practice of the last four years of making available a calendar diary to leprosy workers. This publication consists of a variety of materials. In addition to being a pocket-sized date and appointment calendar, the booklet contains 62 pages of supplemental materials. These include brief discussions of the definition, diagnosis, and treatment of leprosy as well as explanations of drug resistance, care and prevention of deformities, health education, record keeping, and classification of deformities. Additionally, a number of these pages may be used by the bearer for his own personal needs such as addresses and phone numbers. Finally, there is a wealth of materials of particular use to the Indian leprosy worker such as postal information, holidays, etc. It is a useful organizing tool for those leprosy workers fortunate enough to receive a copy.—G. Gordon

Neimark, A. E. *Damien, the Leper Priest.* New York: William Morrow and Co., Inc., 1980, 159 pp. Price: US$7.95.

This is the story of Father Damien, told in colorful prose and written for the young people of today. The saga of the Belgian priest who devoted the last years of his life to the neglected sufferers from leprosy in Hawaii a century ago, certainly bears retelling. His life—and more especially his death, thanks largely to Robert Louis Stevenson—awoke the conscience of the world to the victims of leprosy. Contracting the disease himself, Damien demonstrated that it was possible to *catch* leprosy, and this was only a few brief years after the (London) Royal College of Physicians had pronounced in a weighty report that leprosy was probably a hereditary disease—and Father Damien's Belgian ancestry was impeccably free from leprosy.

The book is definitely not written for critical leprologists, but factual blemishes like "itchy spots on the skin" (p. 51), and "leprosy . . . a fatal infection" (p. 51) should have been detected and removed; and historical inaccuracies (e.g., leprosy occurring 2000 B.C. in India and China, and 1500 B.C. in Japan (p. 52), and Moses advising "oil and tree sap" (p. 56) as treatment, might have been avoided; and the statement (on p. 59) that "a quarter of Europe's people had been attacked by leprosy" is surely an exaggeration. The unknown "mysterious causes of leprosy" (p. 91) had been earlier discovered and "labelled *Mycobacterium leprae*" (p. 82). It was news to the reviewer that leprosy could "degenerate the tissues of the body" (p. 51), and that earlobes could be so enlarged that they "hung to the shoulders" (p. 52).

However, these professional cavils will probably pale into insignificance in the eyes of those who are offended by the recurrence of the banned word "leper" in the title and throughout the book. The word has today a false ring about it, as dated and objectionable as the word "native" (p. 29). Has *The Star* been fighting a lone and losing battle over the years, in the country of its birth?

Apart from these criticisms, the story unfolds with the maximum of evocative and gruesome descriptions of the horrors of the untreated disease. One's admiration for the figure who found Molokai a cesspool of vice and filth and left it a garden is enhanced by the retelling of this heroic and challenging tale.—S. G. Browne

The Membrane Pathobiology of Tropical Diseases. Tropical Diseases Research Series: 2. Proceedings of the Meeting held in Titisee, Federal Republic of Germany, 4–8 October 1978. Basel: Schwabe & Co. AG, 1979, 226 pp. Price: Sw. fr. 30.-/DM 34.50.

The workshop and book deal with the six diseases of initial emphasis by the UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases, namely malaria, schistosomiasis, filariasis (including onchoceriasis), trypanosomiasis (both African and Chagas' disease), leishmaniasis, and leprosy. The book begins with a survey of recent research and general principles in plasma membranes of eukaryotic cells. Of particular interest to leprologists, an explanation is provided of the "secretion-recapture" hypothesis for lysosome formation. Traditional thinking is that the lysosomal enzymes are synthesized in the rough endoplasmic reticulum, concentrated into small vesicles and Golgi apparatus or specialized regions of the smooth endoplasmic reticulum, and are then pinched off as primary lysosomes. These primary lysosomes eventually fuse with phagocytic or endocytic vesicles to form secondary lysosomes. Newer evidence favors an alternate mechanism, "secretion recapture" with the following features: a) lysosomal enzymes are synthesized with a "recognition marker"; b) the enzymes are secreted to the cell exterior; c) the enzymes are then bound at the cell surface via the "recognition marker"; d) the enzymes are then "recaptured" by endocytosis to form primary lysosomes (no substrate) or secondary lysosomes (with substrate). The implications of the "secretion-recapture" concept are great for leprosy where the pathogens appear to reside in normal phagolysosomes. Conceivably, "recapture" is inefficient in the infected cells, perhaps selectively so, and perhaps due to the impairment of the recognition process.

The chapter devoted specifically to leprosy is written by Drs. P. Draper, C. K. Job, and J. H. Hanks and points out that among the ways that pathogenic bacteria can cope with phagocytic cells, *M. leprae* can be phagocytosed, but then they "enjoy their environment." Membrane biology is important in at least two aspects of leprosy work, in studies of the relationships between the bacteria and the host cell and in the particular nature of the membranes of *M. leprae* which allows it to adapt to its peculiar intracellular environment. It is pointed out that viable *M. lepraemurium* tolerate fusion between phagosomes and lysosomes both *in vitro* and *in vivo*. Viable *M. tuberculosis* inhibit fusion (but not dead organisms) inside cells cultured *in vitro* although they can apparently tolerate fusion if it occurs. *M. leprae* may be found *in vivo* inside phagolysosomes, but it is not clear as to whether or not fusion may be a fatal process for *M. leprae*. An unusual aspect of *M. leprae* infections is that the intracellular organisms can apparently occur free in the cytoplasm of cells, not surrounded by membrane of host origin. In the majority of tissues from leprosy patients, most of the bacteria are in phagosomes or phagolysosomes, but occasional cytoplasmic bacteria have been noted. In mice infected with *M. leprae*, the dividing organisms seem to be in the cytoplasm of the host cells. In biopsies of histoid leprosy cases, significant numbers of "free" bacteria are also found. If it is true that dividing *M. leprae* occur free in the cytoplasm of the host cell, then analogies drawn with *M. lepraemurium* or with any other intracellular organisms are likely to be misleading. Growth requirements for *M. leprae* in that case may more likely resemble those of protozoan parasites, which seminally occur free in the cytoplasm of the host cell. The mechanism by which *M. leprae* escapes from the phagocytic vacuole is unknown since the organism has no flagellae or other surface structures, its surface consisting of the same chemically rather inert materials as other mycobacteria. Other unexplained findings include the entry of *M. leprae* into cells which are not ordinarily phagocytic such as osteoblasts, nerve axons, skin epithelial cells, and parenchymal cells of armadillo liver.

Pertinent properties of *M. leprae* and *M. lepraemurium* are compared. It is noted that both species fail to grow in pulmonary tissues, suggesting that the oxygen sensitivity of *M. lepraemurium* may also be shared by *M. leprae*. It is pointed out that the major physiologic defects in intracellular mycobacteria are related to membranes. The fundamental impairments are: a) low cytochrome content and b) leakiness, i.e., plasma membranes that permit leaching of soluble, essential metabolites.

The book admirably fulfills the stated goal of the series to deal with current outstanding problems in research as related to the control of major infectious tropical diseases. Hopefully, it will attract scientists working in other disciplines to the problems and opportunities for research in the fields of concern to the Special Programme for Research and Training in Tropical Diseases and acquaint leprosy workers with advances in membrane pathobiology which may be applicable to leprosy.—RCH

The Role of the Spleen in the Immunology of Parasitic Diseases. Tropical Diseases Research Series No. 1. Proceedings of the Meeting held in Geneva 12–14 June 1978. Basel: Schwabe & Co. AG, 1979, 300 pp. Price: Sw. fr. 38.-/DM 44.

The spleen receives from the blood and holds antigen and macrophages, antigen reactive cells, antibody producing cells and their precursors, and supports their interactions, which result in antibody production and cell-mediated immunity. Thus, as an effector immunological organ, especially in blood-borne diseases, the role of the spleen is difficult to overestimate.

This book, which is the work of an international group of experts meeting under the auspices of the UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases, presents a comprehensive overview of the anatomy of the spleen, trafficking and sequestration of lymphocytes between the spleen and blood, and splenic regulation of humoral and cellular immunological responses. The role of the spleen in the following tropical diseases is discussed: malaria, filariasis, trypanosomiasis, and murine Babesia. Other topics include, for example, tropical splenomeg-

aly syndrome and the role of the reticuloendothelial system. The discussion of each topic is amplified through the inclusion of an extensive list of references.

This hardbound volume is very interesting and informative. It admirably adheres to the charge, stated in its preface, of attracting scientists working in other disciplines to the problems and opportunities for research offered by the infectious organisms of concern to the UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases and acquaints those already working on these agents with new approaches for investigation which other biomedical sciences may offer.—E. J. Shannon