
BOOK REVIEW

Annual Review of Public Health, 1987, Vol. 8, (ed.) L. Breslow, (Published by Annual Reviews Inc., 4139, El Camino Way, Palo Alto, California 94306, USA), Price: USA \$31, Elsewhere \$34.

To most of us in the Third World, public health is synonymous with infectious diseases, malnutrition and infant mortality. Our health services and epidemiology/biostatistics are all therefore naturally geared to the unsolved problems of malaria, leprosy, tuberculosis or infant mortality. Environmental health in our context is again overcoming morbidity associated with environmental sanitation, water-borne diseases or contamination of food by fungal infection.

Reading the volume under review takes one, however, to an entirely different world of public health. Topics like age and disease-specific, behavioural aspects of health and sub-topics like long-term care, maternal behaviour and perinatal risks, legal aspects of human genetics, computer-based health promotion etc. sound esoteric in the context of "Health for all" by 2000 AD goals set for the Third World countries, but constitute valuable overviews of many public health problems of global significance.

The *Annual Review of Public Health* has been appearing for the last eight years. The review for 1987 contains 17 articles covering a variety of health problems most of which are of main concern today to highly industrialized societies. These include trends in the health of the elderly population, physical activity and the incidence of coronary heart disease, computer-based health promotion, the emergence of youth suicide and others. The article on malaria and its control is an exception with its special significance to the Tropics of Latin America, Africa and Asia. The same must be said of the article on international mobility of hazardous products, industries and wastes especially in view of the unregulated import of hazardous technologies with their high potential for 'Bhopals' and Third World Countries being used for dumping hazardous waste. The article highlights in a tabular form the wide prevalence of 'double standards' in worker and community health protection in the world today. Lack of health safeguards for Third World workers by multinational corporations based in Europe, Japan, Canada, USA and Australia is evident in the asbestos, vinyl chloride, pesticide, chromate, steel and chlor-alkali industries.

The problems posed by malaria control are not merely the ones usually attributed to deficiencies in the management of public health in the Third World. There are also many scientific problems to be solved. Thus the epidemiology of malaria is influenced by the immune status of the population. The ability of the host to resist malarial infection depends both on the innate defence and the acquired immune response. The absence of Duffy blood group antigens Fy^a and Fy^b appear to confer natural resistance to infection with *P. vivax* as seen in West and Central Africa. Problems related to insecticide resistance of the vector and drug resistance of the parasite complicate control and eradication of the disease. In spite of enormous inputs into the chemotherapy programme an ideal antimalarial drug is yet to emerge.

The challenges in developing a successful vaccine for malaria are many including the complex structure of the parasite and its intricate multi stage cycle of developments in man and the mosquito. The progressive transformation of the plosmodium from the human host through the insect vector is reflected as definite expressions of its genome and the generation of a large number of antigens. The strategy is to identify those antigens which will be of use in conferring protective immunity to the host. The requirements for an effective vaccine are polyvalence for several species and strains of human plasmodia, lasting immune response for at least one year and applicability to large populations in Asia, Africa and Latin America. These goals are still beyond our grasp.

The review on the effectiveness of electronic fetal heart rate monitoring brings home the sane conclusion: expensive techniques based on sophisticated gadgetry give only marginal benefits and it is better to concentrate on more effective public health care programmes to protect neonatal health.

Voluminous data generated in epidemiological studies or in community health programmes require good statistical methods for presentation. The relevant issues have been dealt with in depth in an article on graphical methods in statistical analysis.

The chapter titles of Volumes 1-8 included as an appendix to this volume is a thoughtful addition and should be welcomed by all students of the progress of public health sciences. The Annual Review is an exceedingly valuable reference source on trends of frontier developments in the scientific side of

environmental health, policies and management of public health care system.

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Annual Review of Phytopathology, Vol. 25, 1987, (ed.) R. James Cook, (Published by Annual Reviews Inc., 4139 El Camino Way, Palo Alto, California 94303, USA), pp. 460, Price: USA \$ 31.00, Elsewhere \$ 34.00.

The volume contains 23 chapters distributed as follows: prefatory (three), historical perspectives (three), concepts (two), fungi (one), bacteria (two), nematodes (one), viruses (one), abiotic stress (one), morphology and anatomy (one), genetics of host-pathogen interaction (one), epidemiology (two), biological control (two) and special topics (three on *Phytophthora* biology, aflatoxin epidemiology and fungal endophytes). These chapters are followed by subject index, cumulative authors index (volumes 1-25) and cumulative index of chapter titles (volumes 1-25).

The preface and prefatory chapters by J. G. Horsfall, R. G. Grogan, R. E. F. Mathews and R. K. S. Wood give a deep insight into phytopathology in general and virology and physiological plant pathology in particular. The chapters on the pioneers in phytopathology, expose step by step the scientific eminence of R. E. Smith, J. C. Walker and H. H. Flor. All the articles are full of personal anecdotes, which should serve as a catalyst for the young plant pathologists, specially because the write-ups emphasize the critical ability of persons, who, by sheer sincerity, hard work and honest approach have reached the highest peaks in phytopathology.

The volume emphasizes that plant pathologists (doctors) only diagnose and prescribe; accordingly they do only 'adaptive' researches. The preoccupation with the narrow concept of disease etiology limits the understanding of the disease process and, therefore, also the ability to prescribe production-management practices for consistent maintenance of plant health, which usually requires research work that is far more extensive than 'adaptive'. There is a critical need for continued fundamental researches on all factors (genetic, biotic and abiotic) as well as their interactions involved in impairment of plant health. There is a strong case to focus researches on

a few representative diseases.

The chapters on biological control highlight the latest developments in the biocontrol of bacteria, viruses and viroids causing important plant diseases. One is advised to seek suppressive soils or antagonists where a plant disease does not occur or cannot develop. However, there is now a potential threat to the continued success of the biological control of crown gall because pAgK84 (the plasmid coding for the synthesis of agrocin-84) is a conjugative plasmid and can be transferred to phytopathogenic bacteria, which will no longer be subjected to biological control; therefore, the deletion mutants of pAgK84 that cannot transfer are being constructed. There are some notable achievements. For example, a gene for chitinase synthesis from *Serratia marcescens* has been cloned in *E. coli* and transferred to *Pseudomonas fluorescens*, which is very efficient root coloniser; these chitinase strains would protect plants from pathogenic fungi which have chitinous walls. The transfer of avirulence genes to a pathogen would convert the latter to avirulence and hence protect the crop. For the control of virus diseases, specially in the case of cross-protection involving viral protein coat, the DNA of the appropriate part of the genome is constructed, cloned and transferred to a dicotyledonous plant; such plants synthesize protein-coat component but not the intact virus. The seemingly simple transmission of viruses by beetles turns out to be an involved biological process. Beetle regurgitant is active in determining the viruses that are transmitted when the gross-wounding technique of inoculation is used, and the factor responsible for this selective action in regurgitant is RNase. Pathogenesis of *Erwinia* depends not only on active PL's (pectate lyases) but also on the integrity of the core oligosaccharide of the LPS (lipopolysaccharide) and an unimpaired capacity to acquire iron.

The chapters on anastomosis groups of *Rhizoctonia solani*, long-range transport, *Rhizobium*, fungicide screening, rust appressoria, salt tolerance and crop production, *Meloidogyne-Fusarium* interactions, rhizosphere microorganisms, bacterial blight of rice, molecular markers for fungi and molecular genetics are up-to-date, informative, critical and mention the priority research areas.

Molecular genetics will play an increasingly important role in plant pathology. The introduction of useful genes into plants may be relatively cheap. Some subjects which need immediate attention include: hypovirulence, biocontrol of fungal root pathogens by *Pseudomonas*, pathogenicity of *Ustil-*

go violacea, linear plasmids in *Fusarium oxysporum*, importance of proteinase inhibitors in defence, genetic engineering for biological control. We are now in a position to ask questions that were previously not considered: for example:- (i) The mechanism of growth orientation in rust fungi (appressoria), site recognition, molecular and genetic regulation of cell differentiation. (ii) The role of root-knot nematode in the modification and/or breakdown of monogenic resistance to *Fusarium* wilt. (iii) The role of deleterious rhizosphere organisms (DRMO) or plant growth-promoting rhizobacteria (PGPR). (iv) The need for developing reliable methods to detect pathogens in seeds, as well as disease evaluation. (v) RFLP (restriction fragment length polymorphism) markers in fungi. (vi) *In vivo* screening methods for fungicides. (vii) Basis of a successful *Rhizobium* infection. (viii) Active suppression of host defence system.

The volume will be most useful for students, teachers and research workers specially in the field of plant pathology in the areas of biochemistry, microbiology, physiology, taxonomy, entomology and genetics.

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The Bacteria by J. P. Verma (Published by Malhotra Publishing House, A 38/3, Phase I, Mayapuri Industrial Area, New Delhi 110 064), 1987, pp. 208, Price: Rs. 125/-.

This short book concentrates largely on the biology of bacteria with some attempt to correlate biological function with the chemistry of bacteria. Though it deals in detail with the fundamentals of bacteriology, the book is primarily intended for the undergraduates who plan to take up agricultural microbiology. Thus, there is one chapter on important bacterial diseases of plants and another on host-pathogen interactions. The introduction part deals with the early history of bacteriology, staining and pure culture study of bacteria and details of the symptoms of bacterial diseases of plants. This is followed by chapters on the structure of bacteria, locomotion of bacteria, growth and nutrition of bacteria, bacterial genetics, classification of bacteria and bacteriology of soil, water, air and milk.

The reviewer does not wish to go into great detail

on what he sees as shortcomings of the book, but there are two points that must be made. The first is the concise nature of the book which would confuse students who want to learn about modern aspects of microbiology. For instance, the chapter on bacterial genetics is so condensed that a beginner will not be able to profit from a reading of the chapter. Microbiology today stands at the cross-roads of life sciences, and without adequate explanation of terms in biochemistry and molecular biology, a student of bacteriology cannot aspire to have a clear understanding of modern bacteriology. The second is the absence of a well-defined chapter in bacterial metabolism. The function of ATP must surely be the most fundamental factor to be understood if students are to comprehend the chemistry of life.

The book is free of printing errors but contains some factual mistakes. For instance, on pages 111, 112 and 113 the structure of benzene rings is wrong since the rings don't contain double bonds. On page 77 in the graph of Growth Curve, the death phase should not go all the way to the bottom of the graph but should stop about one-third of the way down. In general, the graphs are confusing, since the X and Y axes are not indicated on the graph itself but are indicated by numbers which are explained in the footnote.

The book should be useful to undergraduate students who want to have an introduction to bacteriology, but they have then to read other standard textbooks in microbiology to have an in-depth knowledge. The price of the book, however, would discourage most students from purchasing the book for personal use since Asian Editions of Textbook of Microbiology which are about four times the size of the book under review cost about the same.

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CDRI Researches on Parasitic Diseases by G. N. Ghatak, S. Bhattacharji and M. M. Dhar (Published by National Information Centre for Drugs and Pharmaceuticals, CDRI Campus, Lucknow 226 001) 1987, pp. 194, Price: not given.

The book highlights the work carried out at the Central Drug Research Institute, Lucknow, from 1951 to 1986. The developments in the areas of

animal models and chemotherapy at various parasitic diseases make an interesting reading for one who is embarking on a career in parasitology.

The monograph could have been further improved, if at the end of each chapter the dosage and efficacy of the drugs used had been tabulated. The table in the chapter on "Experimental models" could have been enlarged to include the route and amount of inoculum used, type of infection produced and the main application of these animal models.

There are a few editorial lapses. For example in the second chapter, the title is given as "Amoebiasis free lung Amoebae". The term is quite inappropriate here. Secondly, the authors/editors have repeatedly used the trade names of different drugs like Metakelfin, Fausidar, etc. which do not indicate the

composition. The index of the book also does not cover the entire range of the topics covered in the text.

The monograph furnishes a comprehensive bibliography on the major parasitic diseases at a single place. It will be of immense value to parasitologists actively engaged in research in the chemotherapy and biology of parasitic diseases. It can be unhesitatingly recommended to persons engaged in research and to those planning to take up parasitology research as their career.

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SCIENCE NEWS

BETTER DIAGNOSIS OF JOINT DISEASE

A non-invasive technique just launched commercially for the diagnosis of joint disease could reduce the need for exploratory arthroscopy as a screening method.

Professor Mollan's method links computer technology with an accelerometer. The accelerometer permits doctors to measure the joint movements which they can feel with their hands. For years, doctors have used the 'clicks' and 'clunks' of joints like the knee to diagnose traumatic injury and degenerative diseases. But this has led to a situation where the auditory side of diagnosis has erroneously dominated the field of joint assessment first by use of stethoscopes and more recently by microphones.

The accelerometer is a more sensitive tactile

sensor, according to Prof. Mollan. When it was taped to the skin covering the bony prominences of an affected joint the subtle vibration which was emitted could be picked up and converted to graph readings for scientific assessment.

Prof. Mollan said that the data was so accurate that doctors could not only decide who needed corrective surgery, but what part of the joint was involved and where the intervention would be required. He has been investigating a number of specific applications of the technique, including the diagnosis of congenital dislocation of the hip.

(Further details may be had from: Prof. Raymond Mollan, Queen's University, Belfast, Northern Ireland, UK.)
