

BOOK REVIEWS

Creating More Effective Graphs.

Naomi B. Robbins. John Wiley & Sons, 111 River Street, Hoboken, NJ 07030, USA. 2005. 402 pp. Price: US\$ 64.95.

Science is about measuring and counting, and when it comes to publishing the results of their research, scientists often turn to charts and graphs. One of the reasons for so many poor-quality graphs we see around us, according to Naomi Robbins, the author of the book under review, is that 'we receive much more training in communicating with words than in communicating with numbers'.

Robbins sets out to write a quick and easy-to-read book with four clear objectives and succeeds in achieving all of them. (i) How to make clear and accurate graphs that improve understanding of data. (ii) How to avoid common problems that cause graphs to be ineffective, confusing, or even misleading. (iii) When to use new graphing techniques to simplify complex data presentation. (iv) How to be more critical and analytical when viewing graphs.

The book is an admirable mix of theory and practice. Understanding statistical graphs and drawing valid conclusions from them demand visual judgements. Citing research that evaluated relative accuracies of such judgements, Robbins tells us that, for instance, we judge lengths more accurately than areas, and areas more accurately than volumes. We also tend to underestimate acute angles and overestimate obtuse angles. Such research on cognition provides the underpinning of the author's recommendations about how to make statistical charts more effective.

Given that most scientists prepare their own charts using commonly available software packages, a scrutiny of how each interprets numerical data to convert them into a visual form is another welcome feature of the book. Three-dimensional bar charts, for example, provide two different markers for estimating the value of a variable they represent along the vertical axis. As readers can visualize, the top of a three-dimensional bar is a diamond. Now, is it the top edge of the diamond that represents the value or is it the bottom edge? The author tells us that even 'PowerPoint and Excel, two programs that come packaged together in the same suite, use different algorithms to plot their graphs'.

Although not a straightforward book to design, not allowing text and illustrations to share pages has proved awkward: p. 39, for instance, carries fewer than twenty-five words. Perhaps for commercial reasons the publisher chose a spacious design, which devotes more than a fifth of the page-depth to the header and footer to make a respectable-looking volume of more than 400 pages. The length may have played no role in the price (US \$65), but it puts the book, which deserves to be on the desk of every researcher and postgraduate student, beyond the reach of most libraries in India—a pity, unless the publisher thinks of a special Indian edition.

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Crop Diseases and their Management.

H. S. Chaube and V. S. Pundhir. Prentice Hall of India, M-97 Connaught Circus, New Delhi 110 001. 724 pp. Price: Rs 395.

Major world crops are functioning at only 15–20% of their potential. Therefore, we must judge world agriculture sick. Its sickness is not caused by lack of genetic yield potential, but by biotic and abiotic sources of stress that limit the crop production.

— J. A. Browning, 1998

The purpose of the authors Chaube and Pundhir to write this book is to provide basic and emerging facts whereby undergraduate and postgraduate students may be introduced to the scientific foundation of plant pathology. This subject has expanded tremendously. Pathogenesis and ways by which plants defend themselves are now relatively better understood. Advances in molecular plant pathology are providing appropriate diagnostic techniques for identification of causal agents and diseases. Our knowledge of understanding the genetics of host–parasite interaction has helped in evolving effective tactics of strengthening resistance of host plants. New tools and techniques of molecular biology are being appropriately used and appropriate genes could be successfully introduced in plants and micro-organisms.

Keeping in view the developments in this discipline, the authors undertook the task of writing an updated textbook. This textbook comprises three parts covering principles of plant pathology, principles of plant disease management, and comprehensive treatments of better known representative plant disease.

This book deals with information on etiology, symptoms, pathogenesis and scientifically justified, but most important of all is, they are useful as they help in formulation of methods developed for successful management of disease and thereby increasing the quantity and improving the quality of plant and plant products. Practices of disease management vary considerably from one disease to another depending upon the type of pathogen, host and biotic and abiotic factors involved. Contrary to management of human and animal diseases, where every individual is attended to, plants are generally treated as populations and measures used are preventive rather than curative.

The first part of the book comprises principles of plant pathology, like landmarks in development of plant pathology, disease development, mechanism of host defence, genetics of host–pathogen interaction and disease forecasting. Pathogens are the biotic agents that usually cause diseases in plants by disturbing the metabolism of plant cells through enzymes, toxins, growth regulators and other substances that they secrete and by absorbing foodstuff from the host cell for their own use.

The second part consists of principles of plant disease management. Effective and economical management is the ultimate goal of the science of plant pathology. Precise and correct diagnosis of the disease and its causes are a must for effective management. It is simply because of the fact that the line of treatments could be precisely decided only after correct diagnosis. For example, if smuts, bunts and rusts are the diseases, the user can and should opt for Oxathiin compounds. Similarly, if Downey mildew is damaging the crop, Metalaxyl can be recommended directly. Many a time pollutants and phytotoxicity of pesticides create symptoms that resemble diseases caused by phyto-pathogenic bacteria.

Similarly, these are situations with complex diseases having association of more than one causal agent. What is needed today for effective, sustainable and eco-

friendly management of diseases is the valid and correct diagnosis of the disease. The authors have clearly explained about the different methods of management like cultural practices, physical, chemical, regulatory methods, biological methods and management through host genes. And they have also briefly explained integrated management of important plant diseases. The present IPM thesis is a composite of disease management and integrated crop management.

In the third part of the book, Chaube and Pundhir clearly explain about disease causing microorganisms like fungi, bacteria, nematodes, viruses, protozoa and phanerogamic plant parasites according to kingdom classification. It consists of symptoms, taxonomical character of the pathogen, its life cycle with some photographs and updated integrated management practices.

This book enhances our knowledge about plant diseases. At the same time it tries to develop methods and materials through which plant diseases can be avoided or controlled. In brief, Chaube and Pundhir have written an updated book for undergraduate and postgraduate students interested in plant pathology. They have arranged the topics and contents for easy reading with due continuity.

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Quaternary Geology – Indian Perspective. U. B. Mathur. Geological Society of India, PB No. 1922, Gavipuram, Bangalore 560 019. Memoir 63. 2005. 344 pp. Price: Rs 500.

Quaternary geology has tremendous implications for the well being of mankind into the future. State-of-the-art data on Quaternary geology are now available from various parts of India. High-resolution data on Quaternary stratigraphy,

sedimentation, geomorphology, palaeoclimatology, neotectonics, sea-level changes, geochronology and various other aspects generated so far provide a fairly well-constrained Quaternary evolutionary history of the Indian subcontinent in a global perspective.

This book is therefore timely, a good compendium and surely will provide momentum to Quaternary geological studies in India. The multidisciplinary aspects of the Quaternary period covered in this book are impressive. It will serve as a good reference book for Quaternary stratigraphers, palaeoclimatologists, geomorphologists and neotectonists, and all the young and novice Quaternary scientists who intend to pursue Quaternary geological studies. This is the first of its kind, is comprehensive and summarizes the standard work on important aspects of Quaternary geology into a readable form. Considering the volume of data and information available and paucity of resources, this will be a valuable contribution and is in fact an accomplishment which needs to be appreciated. The book is written in a lucid manner and is divided into nine chapters.

The first chapter discusses Quaternary period in general, including discussions on Pliocene–Pleistocene boundary, climate cooling, evolutionary changes in marine fauna and flora, land-vertebrate fossils, hominid evolution, palaeomagnetic changes and Pleistocene–Holocene boundary. The second chapter gives details on Quaternary stratigraphy including biostratigraphy, climatostratigraphy and magnetostratigraphy. Chapter three discusses Quaternary climate, emphasizing the need for studying climatic changes during Quaternary and climate proxies. A good account of global climatic changes both, long-term and short-lived, can be found in this chapter. Data on Quaternary climatic changes from various parts of India are also summarized. Quaternary sea-level changes are discussed in the fourth chapter. The fifth chapter provides an update on Quaternary dating methods. The first five chapters are of basic nature with limited examples from India and the contents dealt within these chapters are easily available. A lot of data are available now from the Indian subcontinent on these aspects. Nevertheless, information avail-

able in bits and pieces has been synthesized at one place. Chapter six is devoted to prehistory and protohistory, which provides a review of Hominid and cultural evolution and Palaeolithic, Mesolithic, Neolithic and Chalcolithic ages. Combining Quaternary geological studies with archaeological data helps in understanding the effects of geological changes on human cultures.

Chapters seven to nine provide notes on Quaternary geology of Gujarat. Chapter seven deals with the structure and neotectonics, and geomorphology and Quaternary stratigraphy are described in chapters eight and nine respectively. All these are well-structured, lucidly written and sufficiently illustrated. However, these individual chapters on Gujarat though appear imperious in content, unfortunately lack in synthesizing and bringing out facts and do not provide latest information. What appears in these chapters is only a short description of neotectonic, stratigraphic, sedimentologic and geomorphic evolution of this important Quaternary terrain of India, which otherwise is a treasure house for data pertaining to these aspects. Quaternary geological studies in Gujarat have progressed by leaps and bounds in the last few decades and we do have a much better understanding of the geological processes that played key roles in the evolution of the present scenario of Gujarat. High-resolution data, especially of late Pleistocene–Holocene period, available not only from Gujarat, but also from the several parts of the country could have been properly synthesized.

The book has several figures, photographs and tables. The figures by and large are of good quality barring those directly scanned from various published papers. The reference list given at the end of each chapter is quite exhaustive, though some of the references are repeated. Nevertheless, I feel the author has done a commendable job in writing this book. Earth scientists interested in Quaternary geology would like to obtain a copy of the book.

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