

## BOOK REVIEWS

**Environmental Geology—Indian Context** by K. S. Valdiya, (Published by Tata McGraw Hill Publishing Co. Ltd., 4/12, Asaf Ali Road, New Delhi 110 002), 1987, pp. 583, Price: Rs. 270/-.

As mentioned in the preface, the book is primarily for graduate and post-graduate students. The book is divided into six parts with 21 Chapters spread over 583 pages.

Part I (perspective) is a good introduction for those who want to know about environmental sciences in general and environmental geology in particular. The illustrations and the Indian examples are simple and are nicely explained for beginners. The author has taken considerable time to compile various statistics on Indian sub-continent (state-wise) such as forest cover, rate of erosion, land degradation, etc. which can be used for quick reference.

Part II deals with the resources such as land, soil, water and minerals. Land use pattern shows that India's per capita land availability is declining from 0.48 ha in 1951 to 0.14 ha by 2000 A.D. However the author's contention that the tribals residing in forests of north east are primarily responsible for half a million hectare of rain forest clearance is debatable.

The land use and soil chapter is informative particularly for agricultural scientists. The chapters on water and mineral resources are useful for geoscientists. The book being essentially on environmental geology, one expects more on mineral resources and related environmental problems than what is given in the book. Data are also not updated. For example the anticipated coal production in India by 2000 A.D. is 350 m.t and not 200 m.t. Today mining is one of the major environmental hazards in our country and geo-scientists need to concentrate on this subject.

Part III on deterioration, deals with erosion and desertification. It is very interesting to note that Indian rivers carry nearly 1.5 billion tonnes of eroded material to the ocean and this is at a much higher rate than the global average. Such accelerated erosions are due primarily to man-made changes which have serious economic implications in the agricultural sector. Similarly the desertification and its rate of expansion are at alarming rates.

In part IV the natural hazards have been dealt with giving graphic details, though, in a strict sense, they may not fall in the environmental geology framework; but their after-effects have a great

control over the existing environment. The chapter on instability of hill slopes and land slides is very interesting. Considerable work has been done by many workers including the author around Nainital Lake. These studies indicate the magnitude of the problem. Although the chapter on snowy mountains contains a lot of useful information, one feels that it is much more elaborate (with over 100 pages) than necessary.

Part V (development and geotechnology) is primarily for engineers to understand the geological features in major construction activities. The development without destruction is the basic message of this part. These chapters have to be understood in the context of avoiding major environmental hazards. The chapter on dams and reservoirs gives an idea about engineering structural problems of construction in relation to its geology. Geological cross-sections of many major dams and their implications are discussed.

Environmental impacts of large dams on erosion, sedimentation and water quality are discussed in detail supported with a large amount of Indian data. Discussions on large dams are very useful for students and researchers as ready reference. Similarly the problems of buildings, roads, and tunnel constructions have been elaborated in separate chapters.

The final part VI (on pollutants and waste) discusses various types of pollutants and wastes generated in the country, including natural pollutants like fluorides in drinking water. However increase of global temperatures and consequent adverse effects due to the increased CO<sub>2</sub> (p. 519) are not conclusive and represent only a point of view. Though, everyone agrees with the author's concern for noise pollution, few might endorse his suggestion 'tax on use of sound amplifiers'. The final chapter on alternative source of energy has generated a new perspective about our energy needs. Overall the book is well written and the author's expressions are very powerful and impressive. The quotations from various scriptures are appropriate and impressive. The author's personal concern on degradation of nature is clearly noticeable particularly on the Ganges and on the Kumaon hills. Some emotional statements such as 'land which should have been under forest' (p. 58) might give an impression that the author is not a realist, but it certainly conveys his deep concern for environment.

The references (p. 494) are very useful for researchers.

The book contains some minor errors. For example there is no Karimganj district (p. 480) in Andhra Pradesh; it might be Karimnagar. Figure 21.2 (p. 480) does not apply to Indian conditions. The total area of forest cover has been mentioned differently (pp. 31 to 33, 14.1% or 21.3%, page 59—12%). The quality of photographs could have been improved.

Some references are not listed (e.g. Biswas and Saha, 1983); a few are wrongly listed (e.g. Kayastha and Kumar, 1980). Literature survey dealing with erosion, pollution etc. is not up-to-date.

This is the best comprehensive book available on the subject by an Indian author. This is highly recommended for all college students and researchers. Even the general libraries can purchase the book for the benefit of the public. Paper-back edition is suggested for greater circulation.

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**Journal of the Ecological Society**, Vol. 1, 1988, (ed.) Prakash Gole, (Published by the Ecological Society, Pune 411 008) pp. 76, Price : Not given.

This is one more addition to the ecological journals published in India. Volume 1, under review, is like a digest, comprising 9 articles, one of which is in Marathi with an abstract in English. These are not necessarily addressed to ecologists in the strictest sense of the term; even a layman can enjoy reading these. The articles vary in nature, from the history of man in the Indian desert to environmental planning and wildlife.

Two eminent archaeologists of Deccan College Postgraduate and Research Institute, Pune, V. N. Misra and S. N. Rajaguru, have joined hands in reviewing the history of man in the Thar. In order to forecast future change, the focus is on past environments. This is particularly relevant in view of the fact that the current year has been assigned the theme of climatic change on the World Environment Day celebrated on 5th June 1988.

Geomorphological evidence points to the prevalence of a rainy climate in the Thar a million years ago when it was drained by mighty rivers. Later, tectonic movements disrupted this drainage pattern.

The excavations carried out by the authors in Rajasthan have produced the significant evidence that man appeared in the region half-a-million years ago, when the drainage pattern was less developed. Prior to this important discovery it was believed that man came to inhabit the desert only about 100,000 years ago.

Climatic fluctuations that have taken place within the last 70,000 years have been deciphered from a 16-m-deep profile of a sand dune at Didwana. Man had managed to inhabit the arid environment that lasted from 70,000 years B.P. to 10,000 years B.P. However, this long spell of aridity was punctuated by shorter intervals of humid phase.

The paper has missed some important inferences drawn from recent palynological studies [e.g. Van Campo, E., *Quat. Res.*, 1986, 26, 376; Van Campo, E. *et al.*, *Nature (London)*, 1986, 296, 56.] A serious shortcoming of the Journal is that most of the articles are without references.

In the paper entitled "The environment-conscious habitat", Shirish Beri discusses the points a building designer has to keep in mind for rational house planning. Prof. Kanhere of the Town Planning Department of College of Engineering, Pune, has analysed how the traditional urban subsystems operating in an old city like Pune in harmony with the environment are disrupted in the wake of rapid expansion and industrial growth. The earlier courtyard (*chowk*) and the house (*wada*) types of introvert system had the advantage of good ventilation and greenery around the dwellings without any wastage as even the garbage was used as manure. Such an introvert system made room for an extrovert type with the introduction of compact houses. One notes with concern that the open spaces have almost disappeared in the old section of the city and that the slum-dwellers constitute as much as 40% of the population.

Beth Middleton reports on the feeding habits of barheaded geese (*Anser indicus*) and greylag geese (*A. anser*) of the wetland of Keoladeo National Park at Bharatpur. Both species avoid agricultural crops and prefer the wetland grass *Paspalum disticum* during normal monsoon. However, in drier areas, *A. indicus* feeds on *Cynodon dactylon* while *Elaeocharis palustris* constitutes the main diet of *A. anser* during the dry December.

In the next paper Van der Ven provides helpful hints on nature management, emphasizing the value of a good vegetation map. Such a map of the Keoladeo National Park has recently been brought out by the French Institute, Pondicherry, in col-

laboration with the Bombay Natural History Society.

Prakash Gole focuses attention on the problems facing the hill resorts of Maharashtra—Mahabaleshwar and Panchgani. Within a span of just 5 years, the tourist influx has doubled, putting great pressure on land, water and biological resources, mainly forests. The building boom led to conversion of agricultural land into non-farm houses. Though the Regional Planning Board has decided not to allow any shrinkage of the existing forest cover, which is estimated at 52% of the total area, in the opinion of this reviewer the so-called forests of these hill stations are already degraded and would fail to classify in the category of true forests of which only about 10% exist in the country.

S. Ingahlallikar enumerates 34 species of birds of prey and 6 species of owls observed in and around Pune with an overall density of 2.6 birds per hectare. Their habitat and resident or migratory status have also been indicated. The owls of Pune also receive attention from Tejas Gole. R. Ladhekar, in his paper in Marathi, comments on the occurrence of *Podiceps cristatus* near Nagpur.

The cover-photo is eye-catching but without a title. The quality of printing is good; the only printing error I came across is on p. 51 (practically).

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**Manual of Wheat Diseases**, (eds) L. M. Joshi, D. V. Singh and K. D. Srivastava, (Published by Malhotra Publishing House, 38/3, Mayapuri Industrial Area, New Delhi 110 064), pp. 75, Price Rs. 50/-, US \$ 8/-

The Manual is primarily intended to give scientists some new techniques recently introduced in the field and glasshouse investigations of wheat diseases. It describes wheat diseases, their symptomatology, methods of isolation of the pathogens, multiplication of inoculum, its preservation over a period of time, creation of epiphytotics in field for screening germ plasm and recording of yield data.

Brief notes are given on stem rust, leaf rust, stripe rust, loose smut, karnal bunt, hill bunt, flag smut, powdery mildew, alternaria leaf blight, helminthosporium leaf blight and spot blotch. Some instru-

ments for aerobiological studies are also given in the text and their use described. There is a survey of recent literature connected with the techniques described.

The Manual is essential for all those involved in wheat disease research in the Universities, National institutes, as well as Regional research stations. The book will be of great help for scientists and technicians for uniformity in data collection and proper interpretation.

There are a few minor errors which could have been avoided. For e.g., Table 1, pp 22, gives 'stem rust' for 'stem rust'. Page 4, '*Nigrospora sphaerica*' for '*N. sphaerica*'.

The authors should have given the authorities for the taxa in the text. The caption "Techniques in Wheat Diseases" is not very expletive, so also the caption of the book itself, "Manual of Wheat Diseases" as this does not cover all aspects of wheat diseases.

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**Pathology of Cyst Nematodes** by Renu Sharma and Gopal Swarup, (Published by Malhotra Publishing House, A38/3, Phase I, Mayapuri Industrial Area, New Delhi 110 064), pp. 88, Price: Rs. 88; US\$ 15.

Nematodes appear to have many types of microbial antagonists in nature. These associated micro-organisms may influence nematode activity and reproduction directly by parasitizing cysts, eggs or developing females, or indirectly through toxic or inhibitory effects of their metabolism or interaction and thus affect the population dynamics of nematodes in the soil. This book is an excellent contribution in this direction and for the first time in this country, an attempt has been made by the authors, which will draw attention of not only nematologists but also of other plant protection scientists interested in the management of nematodes through the use of biocontrol agents. The book satisfies a long-felt need of students and research workers interested in the field of biopesticide development.

Seventeen different micro-organisms (15 fungi, one bacterium and an unknown causing degeneration) with their effect on the biology of six *Heterodera* sp. have been reported. Detailed studies on the identification and frequency of occurrence of

micro-organisms are enlisted. Their effect on hatching, root penetration and development of cyst nematodes have also been studied in-depth. Fungal biology and cyst pathology are narrated well.

The book is well printed with good photographs and the diagrams are neatly drawn. It is a must for

any nematologist. All libraries should possess this book.

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## NEWS

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### A 'NOBEL' FOR ENGINEERS

Nominations are now open for a new engineering award, the National Academy of Engineering announced last month. It will present \$350,000 next year for the recent engineering and technology achievement with the most impact on everyday life. The prize, to be awarded in October 1989, will be the first from a fund endowed by the Charles Stark Draper Laboratory. To stress the award's prestige, its value was intentionally set to equal the Nobel Prize, says academy official Alexander Flax. Like the Swedish honor, the biennial award will also include a gold medal.

Flax gives examples of the sort of work the 13-member selection committee would consider important: the inventions of radio, the light bulb, fiber optics, and the computer chip. "Draper himself would have been a good choice," says Flax. Draper, who died in 1987, invented the inertial guidance system used by virtually all aircraft today. (*The Scientist*, Vol. 2, No. 21, p.19; November 14, 1988; published by Institute for Scientific Information Inc., '3501 Market Street, Philadelphia PA 19104).