

Out of the twelve papers on marine instrumentation, nine present original work on the development of new instruments, some of which have been field-tested and merit consideration for commercial production, and three give overviews of commercial systems of foreign manufacture and data management systems. The instruments are used for integrated data acquisition and measurement of water quality: spectral irradiance, underwater thermal profile, ambient noise, tidal heights, subsurface currents and core sampling. The article on nondestructive testing is just a review article on current techniques.

An excellent set of eight papers deals with satellite oceanography, namely techniques for deriving from satellite data information on fish abundance zones, littoral sediment transport, sea surface temperature and mixed-layer depth, atmospheric moisture content, surface wind and wave, latent heat flux and bathymetric features. With the advantage of getting synoptic data over wide regions at periodic intervals from the satellites, these papers will be valuable for research studies and applications.

Another topic of contemporary interest, namely, exploration for and exploitation of polymetallic modules in the central Indian Ocean, as well as the environmental protection aspects while mining, is dealt with in about fifteen papers which merit careful study.

Environmental pollution, in particular oil spilling, is the subject of five papers; the use of microbes for oil degradation or recovery is discussed in four papers. Other aspects of biotechnology, such as processing seaweeds for drugs, are discussed in three papers.

Among the fifteen papers dealing with different aspects of ocean science, some are significant and worth follow-up, such as the spatiotemporal variability of biological and physical fields, simulation of acoustic propagation, storm surge modelling, classification of acoustic echoes from seabed with broadband signals and directional response computation for an arbitrary acoustical array for broadband signals.

The usefulness of the book would have been enhanced by introducing each of the ten major topics with a summary of the present status as revealed in the papers and the perspectives for future. A symposium of such a high order as the one under review would have seen valuable discussions at the end of presenta-

tion of each paper and their inclusion would have further enhanced the value of the book. However, even in its present form, the book is highly informative and will be valuable to any research worker in emerging fields of ocean technology.

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**Botany in India: History and Progress.** Vol. I. B. M. Johri, ed. Oxford & IBH Publishing Co. Pvt. Ltd., 66 Janpath, New Delhi 110 001. 1995. xxxi + 521 pp. Price: Rs 950.

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The above publication, a multiauthored volume, comprises consolidated information primarily on lower groups of plants from India. During the past three decades or so, there has been phenomenal increase in research activities in the country not only on fundamental aspects of botany but also on several new disciplines/aspects that have been initiated and fruitful research conducted on them. The volume of research publications has been enormous and it is difficult to keep abreast of the information on all the facets of one's own speciality, leave aside botany as a whole. Almost all the contributing authors (except probably one) of the above volume are well-established specialists in their own fields of research and have, therefore, done a fair job of assembling and arranging the research information under neatly segregated sections and subsections. One is often tempted to be subjective in such write-ups, but it is creditable that invariably almost all chapters have an objective approach in their contents.

Historical accounts for the different groups of plants of India have been published earlier at intervals, but probably reviewing them at the beginning of each chapter was evidently a necessity for understanding the continuity of research progress of the subject matter in the subsequent period of time. This has in some cases entailed a partial repetition in some chapters (on fungi).

The title of this publication, in a strict sense, indicates that it gives information only on botanical research carried out in India on Indian plants, by Indian and foreign nationals. Exotic plants studied in India, such as *Tmesipteris* spp. by Sahni at Lucknow (p. 456), could also come in this category. The studies on Indian plants carried out in foreign countries by Indian or foreign nationals, such as *Flora of British India* by J. D. Hooker (p. 22) worked out at Kew (this fact is withheld), actually represent 'botany of India', and such instances get confused or even synonymized as 'botany in India'. However, research on exotic plants carried out outside India by Indian nationals is *certainly not* 'Botany in India', and the editor has been irresolute in allowing such information in the publication to persist, (examples given later).

Since an up-to-date consolidation of information on different branches/aspects of botany in India was not available at one place, the above publication is a welcome venture, which will positively provide referential information to postgraduate students of botany for competitive tests, selection of research topics/disciplines/branches to be pursued at particular centres of that speciality in the country. It may, however, be mentioned that the university botany departments are dynamic as far as the specialities are concerned, because they change with the change/retirement of the personnel – a universal phenomenon, and the specialities in the universities may not necessarily be existent.

The matter dealt with in the different chapters is of high standard and detailed, certain chapters being *par excellence*, having been prepared by specialists with large number of publications to their credit. A major part of the book (Chapters 4–24) deals with the lower groups of plants (viruses, bacteria, algae, fungi, lichens, bryophytes and pteridophytes – some of which were earlier known as cryptogams).

An exploratory history and publication of numerous floras (entirely angiospermic) along with the institutions/agencies known for angiosperm taxonomic work have been outlined in Chapter 2. A much detailed and interesting exploratory history by K. Biswas (in 1943) has apparently not been consulted as there is no citation under the refer-

ences. Information about the number and the presence of the total holotypes/isotypes of Indian angiosperms preserved in Indian herbaria, a must for taxonomical work, is lacking. Information on plants for medicine (Chapter 3), primarily angiospermic in content, could have been more comprehensive, and would probably have been appropriately included in Volume II of Botany in India, where several other aspects of angiospermic research have been envisaged to be published.

In Chapters 4–24 (except 20) the approach to each group of plants is somewhat on similar lines in respect of historical account, structural morphology, taxonomy, physiology, genetics, ultrastructure, etc. Detailed information on the characteristics of the individual groups is well treated. Unfortunately, Chapter 20 on lichens reveals lack of understanding of the concept of lichens and lichen components ('... dearth of information on the mycobionts of Indian lichens', fruit body 'perithecium in *Cetraria*' – an absurdity), inaccurate statements ('lichen research initiated at

the University of Lucknow by Biswas'), prominence to the work on foreign lichens outside India, and several misspelt terms and lichen names.

The following shortcomings/inaccuracies need reporting so that errata may be published if thought proper:

1. Citation of plant species under abbreviated generic name without the full generic name *immediately* preceding, and if preceded intervened by other genus or genera is liable to cause confusion if the first letter of the genera is the same.

2. Inaccurate statements (e.g. p. 456): 'Sahni (1915, 1916), at Lucknow, ...'. Sahni was at Cambridge University during those years. He joined Lucknow University in 1921.

3. Matter not eligible for inclusion in this book:

(i) Sinha and Ashworth (p. 237) on genetic recombination of *Dictyostelium discoideum*

(ii) Cooney and Emerson (p. 243) on thermophilic fungi.

(iii) Garrison *et al.* (p. 243) on thermostability.

(iv) Schmitz and Srivastava (p. 204) on ultrastructure of *Laminaria groenlandica*, etc.

(v) LaRue and Narayanswami (p. 437, 440) on *Lunularia cruciata*

(vi) Rai (p. 381) on carbon–nitrogen ratio on *Peltigera ap'ithosa*, *Platismatia* (misspelt *Platimatia*) *glauca* and *Pseudevernia* (misspelt *Pseudoevernia*) *furfuracea* (= *Evernia furfuracea*). None of the taxa is an Indian lichen.

(vii) Le Blanc and D. N. Rao and Le Blanc *et al.* (p. 382): work was done on Canadian lichens in relation to pollution in Canada.

There are a large number of misspelt words, including botanical names of plants; some of them may be due to the printer's devil, but others do not seem to be so.

The price is prohibitive.

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## Subrahmanyan Chandrasekhar



1910–1995

The news of Subrahmanyan Chandrasekhar's death on 21 August 1995 arrived as this issue of *Current Science* was going to the press. Chandrasekhar's passing marks the end of a glorious chapter in modern physics. Awarded the 1983 Nobel Prize, Chandrasekhar was one of the dominant figures of twentieth century astrophysics. A forthcoming issue of this journal will carry a detailed account of his scientific accomplishments.