BOOK REVIEWS

Structure and Dynamics: Nucleic Acids and Proteins by Enrico Clementi and Ramaswamy H. Sarma, (Adenine Press, P.O. Box 355, Guilderland, New York 12084, USA) 1983, pp. xi + 487, price $49.00.

This book contains papers presented at the International Symposium on Structure and Dynamics of Nucleic Acids and Proteins, held at the University of California, San Diago at La Jolla in September 1982. The authors are well known scientists working in areas such as quantum and molecular biophysics. The articles have been grouped into three categories: (1) Conceptual and Theoretical Background; (2) Structure and Dynamics of Nucleic Acids and (3) Structure and Dynamics of Proteins. One of the research trends in the theoretical study of biomolecular systems in recent years has been an enhanced pace with which larger and larger biomolecular subsystems have been taken up for study. Rapid strides in computer technology have obviously enabled such a development. However, it is interesting to note that the enhanced computational capabilities have not been used to routinely extend the size of systems treated by *ab initio* quantum chemistry, but, rather to perform Monte Carlo, Molecular Dynamics, etc simulations of comprehensive molecular systems. *Ab initio* quantum chemistry is used to characterise the parameters of classical type potential functions, restricted regions requiring close attention like enzyme active sites, and so on. The book under review highlights this trend. It is obvious that the need to go in this direction follows from the intuitive feeling of physical scientists for biomolecular systems. Particularly supportive of this conjuncture are the contributions of theorists, (*e.g.* Per Olov Löwdin's article on the Theoretical Background of Moelcular Biology, and the article of Thole and coworkers on *ab initio* calculations with the Direct Reaction Field Hamiltonian). A serious effort is being made to develop the proper physical and mathematical framework to deal with molecular ensembles and so on. Not only is attention getting focussed on the organizational structure of large biomolecular systems, but serious attempts are also being made to systematize complex functional mechanisms, *e.g* cooperative phenomena semiconductor properties, dynamics and energy transport. The soliton concept has received much attention; there are papers covering both fundamental mathematical aspects of solitons as well as applications to specific biophysical mechanisms.

The sections on nucleic acids and proteins contain results and reviews from experimental studies based on NMR, x-ray crystallography, etc in addition to reports of theoretical studies and numerical experimentation. However, the main emphasis to be noticed in the papers included in this volume (even of those written by experimental scientists) is towards formulation of theoretical and conceptual frameworks of biomolecular mechanisms and phenomena.

The articles in the book cover advanced research techniques in many different specialities. It is difficult to expect any one reader to understand all these applications in full depth. Introductory reviews of the three sections written by Clementi, Olson and Lipscomb are valuable in this respect and they let every reader get a glimpse of what is going on in different specialities. The book will be a valuable reference material for researchers and students of Molecular Biophysics.

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Annual Review of Nutrition by William Darby (Editor) Harry P. Broquist and Robert E. Olson, (Annual Reviews Inc. 4139, El. Camino Way, Palo Alto, California 94306, USA) Vol. 3, July 1983, pp. 478. Price: USA $ 27/- Elsewhere $ 30/-

The science of nutrition means different things to different people. No subject is as multidisciplinary in nature and published in as wide a spectrum of journals as nutrition. Therefore the need and the value of publications like the Annual Review of Nutrition which bring out the state of art reports by experts, need hardly be mentioned. The 3rd volume keeps up to the promise of the editors of providing a balanced appetising fare. The prefatory essay "A feast for Aesculapius: Historical diets for asthma and sexual pleasure" by, science historian Madeleine Pelner Cosman depicts man's interest in food, sex and health, over the centuries.

Like the previous two volumes, a wide spectrum of subjects in different areas of nutrition such as: Proteins, Peptides and Amino Acids—Carnitine, P. R. Borum; Vitamins—Niacin, L. M. Henderson; Inorganic Nutrients—Biological Activity of Selenium, R. F. Burk; Bioavailability of Trace Mineral Elements, R. M. Forces & J. W. Erdman, Jr.; Physiological Ligands for Copper and Zinc, R. A. DiSilvestro & R. J. Cousins; Lipids—Absorption and Metabolism of Dietary Cholesterol, S. M. Grundy; Clinical Nutrition—Nutrition in Renal Failure, M. Walser; Ischemic Heart Disease and Lipids in Blood and Diet, R. A. Stallones, The Endocrine Responses to Protein-Calorie Malnutrition, D. J. Becker, Endemic Goiter and Cretinism at the Dawn of the Third Millennium, J. Matovinovic, Protein Metabolism and Injury, J. M. Kinney & D. H. Elwyn; Maternal/Infant Nutrition—The Placenta in Nutrition, H. N. Munro, S. J. Pilistine & M. E. Fant; Nutritional Anthropology—Food Faddism, Cultism, and Quackery, W. T. Jarvis; Methodology—Stable Isotope Methods for Nutritional Investigation, D. E. Matthews & D. M. Bier; Food/Nutrition Surveys—Food Consumption by Individuals in the United States: Two Major Surveys, P. B. Swan.

Subject index, cumulative indexes of authors and chapter titles have been provided. A list of related articles in other Annual Reviews, such as Annual Reviews of Physiology, Medicine, Public Health, and Biochemistry have also been included, to increase the coverage.

The book will be of interest to nutritionists, biochemists, public health workers and physicians.

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The Role of Parliament in the Formulation of National Science and Technology Policy by A. Rahman and Nirmal Hiritash (National Institute of Science-Technology and Development Studies, Hillside Road, New Delhi 110 012) 1983, pp. 108, Price: not given.

India was practically the first country, say the authors, to adopt in Parliament (in 1958) a Science Policy Resolution, and to appoint a Minister for Science and Technology answerable to Parliament. India can also boast of having the third largest scientific manpower in the world.

Yet with all these, the authors conclude: "It appears that in India, the formal links between the Political and the Science and Technology (S&T) systems as manifested in parliamentary debates are very weak, since very few issues relating to science and technology policy per se are debated on the floor of the House. Also, the parliamentary committee system is not being utilized by members of parliament to the desired extent for probing the working of scientific organizations".

The conclusions are damning, but sadly true. However, while the authors are correct in castigating Parliament for failing to shape in a dynamic way, the formulation and execution of a National Science Policy, they have however failed to understand why this is so.

But before I go into that, the authors own analysis needs to be presented to the reader first.

The authors are of the view that "All the science and technology policies and programmes are based on the views of the leader of the ruling party in Lok Sabha., *i.e.* the Prime Minister". They conclude that most other ruling party members and all the opposition members do not play any active role in the formulation of the national science and technology policy.

There are two reasons for this, argue the authors. First is that the Executive under the Prime Minister maintains a stranglehold on information, and hence no informed debate is possible. Second, Parliament is mostly occupied with political issues, and has very little time for science. The authors lament that only 5% of the questions in Question-Hour deal with Science and Technology.

Before offering my critical comments, let me say that this book is a welcome addition to the meagre stock of science policy formulation library. It will, I hope, inspire others to go into greater depths taking this Rahman-Haritash volume as the departure point.

The major flaw in the book is the approach of the authors: righteous lament. True that Parliament has not systematically contributed to science policy. But can parliament correct itself? Parliament functions in the social milieu. Lok Sabha members have to be elected by the people, while Rajya Sabha members have to be favoured by a political party. If an MP devotes his energy to contributing a science policy in Parliament, will that help that MP to get re-elected?

I recall that in 1978, I devoted much time to having scrutinized the technology policy in the BHEL–Siemens collaboration proposal. Interestingly, the authors appear ignorant of this great debate in 1978. It was at my intervention, that the then Prime Minister

(Mr. Desai) agreed to review the deal. Later on, on another science subject I had raised a heated debate in the Consultative Committee on the question of full-scope safeguards for our nuclear installations. And yet, when I returned to my constituency for re-election, the voters in Trombay, all scientists of BARC, complained to me for not getting them water supply (a job of the Municipal Corporation, not of Parliament), and also for not visiting them (for what?) regularly. No one even bothered to express any appreciation for the discussions on science that I had raised.

This personal example I cite to point out that Parliamentarians can devote serious attention to esoteric subjects like science policy only if the scientific community comes down from its high moral perch, and apprises the MP with correct information to enable him to participate in science policy discussion without his own homework for it. Otherwise, the present state of affairs will continue. Parliament has no incentive to correct itself. Thus the role of Parliament in shaping science policy suffers from having the worst of both worlds—a lack of information ensured by the Government and a lack of effective appreciation from the scientists.

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Fishery Economics and Management in India—1983 by P. S. Rao, (*Pioneer Publishing & Distributors*, D/9 Vanshree, L. T. Road, Borivili, Bombay 400092) Pages 351, Price Rs. 225.00, USA $25.00.

The paucity of up-to-date information on techno-economic and socio-economic aspects of fishing is one of the major handicaps in formulating sound development programs in fisheries. However, it is only during the last three decades expansion and development have taken place in the field of fisheries all over the world including India. Prof. P. S. Rao's "Fishery Economics and Management in India" (1st edition 1983) is indeed one of the few publications dealing with the various aspects of Indian Fishery Economics. He focuses his discussions mainly on 4 topics *viz* (1) Fishery economics, (2) Profitability in fishing industry (3) Fish marketing and management and (4) Social and legal aspects of fisheries.

According to the author fishery resources are superior to that of land based agriculture and are destined to supplement food resources in future. The author attempts to compare the primitive and modern methods of fishing now in vogue in various countries including India. He discusses the fishery resources of India, the productivity of the various regions of the Arabian sea and Bay of Bengal, the functioning of fish marketing system and management with allied problems, fishing trade on the micro-macro levels, selling procedures for fish, price pattern of marine fishes etc. He also describes the Socio-economic conditions of fishermen, the functioning of fishery co-operatives, the law of the sea and the existing important fishery educational institutions in India. A few worked out models are provided to serve as a guide to the bankers in planning fishery projects with their aid. He also makes an earnest attempt to marshal the available statistics and the useful information on the subject.

In highlighting the advantages of mechanisation, Prof. Rao appears to have forgotten to depict the other side of the picture. It looks as if the transition to modern from primitive methods of fishing has come to stay so much so that many have now adopted mechanisation. Nevertheless, the coming of new technology is not without contradiction—a process has already been set in motion to see how and to what extent these contradictions can be forestalled. Only the future can tell of its real impact! The newly introduced capital intensive fishing vessels in our country employing less labour and consuming more fuel still operates—as the author rightly points out—mainly in coastal waters against rules and regulations. These fishing vessels not only monopolise the fish catch within the reach of the small sector but even disturb the cycle of fish. This has evidently resulted in growing violence at sea and a declining trend in fish production.

This publication will be quite useful to the fishery economists, researchers and students.

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Advanced Mycology (A text Book) by A. K. Sarbhoy, (Today & Tommorows Printers & Publishers Ltd, 24B 5, Deshbandu Gupta Road, New Delhi 110 005) *pp. 324, price Rs. 125,-*

The text book on Advanced Mycology is divided into thirty three chapters. There are four chapters on Classification. Historical Introduction to Mycology, Importance of International Code of Botanical Nomenclature and one chapter on Use of Fungal Culture Collection and Herbarium. The remaining chapters deal with the taxonomy of fungi up to the level of families, in some cases up to genera with life cycles of some fungal species considered typical representatives of the families and one (chapter 32) furnishes a brief account of Lichens.

In general the aspects of Mycology covered by the author appear to be those meant for graduate students of Pathology at the I.A.R.I. and some of the Agricultural Colleges in India.

A cursory reading of the contents of the book gives an impression that the book is not well edited. It has many spelling and grammatical mistakes. Adequate attention to punctuation and lucidity of expression is wanting. These deficiencies could have been avoided by good editing and by critical proof reading and they are far too many to be enumerated here. There are references made in the text which are not cited in the bibliography (*e.g.* Ko *et al.* 1978 page 60; Buller, 1915 page 10 etc.). There are some genera named without author (pages 197 and 198). It would be better to indicate what the subject index is expected to include. While most of the orders are mentioned, names of many families are omitted.

There is a suggestion that examples of genera and species of fungi considered important in India were specifically included, however, coffee rust caused by *Hemileia vastatrix* is omitted. Name of Exobasidiales is there on page 218, but no details thereafter. There is no mention of *Exobasidium vexans* on tea.

The class Trichomycetes is very briefly treated without even mentioning additional reading that could be done by those interested in this group (Manier and Lichwardt 1968).

The plates and figures furnished with the exception of some are far from satisfactory. Photographs expected to show disease symptoms are given in black and white as well as in colour. Unfortunately, both fail to serve the purpose (pages 80–82). In some places, ordinary photographs are mentioned as photomicrographs (pages 128, 197), figures or plates are without labels (plates 16, 18, 19 etc.) and photographs without legends (page 78).

Information given on subjects dealt are said to be up-to-date but this is not true (page 103 on Edogone-considerable literature has accumulated since 1974). Under rust, Craigie's work on sex in rust fungi has not been mentioned although it is old and important. The printing and paper used are of poor quality.

Notwithstanding some of the drawbacks enumerated above, the book will be useful to Mycologists in this country.

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NEWS

NATIONAL SYMPOSIUM ON SOLANACEAE

National symposium on 'The economic value and other properties of the plants of the family Solanaceae' was held at Tiruchirapalli from 4–6 August, 1983, under the auspices of the Bharatidasan University with financial assistance from Department of Science and Technology, and Department of Environment, Govt. of India, New Delhi. Fifty workers from different parts of the country participated in the Symposium. It was conducted in seven scientific sessions under five sections on various aspects of botany and chemistry of Solanaceae. The plenary session recommended for establishing a Solanaceae garden at Tiruchirapalli and to publish a periodical Solanaceae news letter.

Incidentally, the Third International Symposium on Solanaceae is likely to be held in India in 1987.