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## BOOK REVIEWS

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**Annual Review of Nutrition, Volume 4, 1984** by William J. Darby, Editor, Harry P. Broquist, Associate Editor, Robert E. Olson, Associate Editor. (Published by Annual Reviews Inc., 4139 El Camino Way, Palo Alto, California 94306, USA.) pp. 610, Price not known.

A plethora of semi-scientific and pseudo-scientific publications has done great disservice to nutritional science by trivializing it and confusing not only the laity but also scientists. The Annual Review of Nutrition is a valuable series which focuses on current concepts in nutrition by publishing expert reviews. These show that Nutrition is a very modern and robust science. Albeit its complexion is multidisciplinary.

Volume 4 starts with a prefatory essay on "Government Regulation of the Integrity of the Food Supply" by Peter Barton Hutt, one of America's distinguished food and drug lawyers. It provides a scholarly historical perspective on the evolution of regulatory activities pertaining to food, without going into some of the emotional issues pertaining to politics of control and regulatory activities. The other area-wise topics covered are:

Branched-Chain Amino Acid Metabolism, A. E. Harper, R. H. Miller and K. P. Block; An Update of Concepts of Essential Amino Acids, Willard J. Visek (Proteins, peptides and amino acids). The function and Metabolism of Vitamin K, Robert E. Olson; Vitamin B<sub>6</sub> Metabolism, Steven L. Ink and L. M. Henderson; Vitamin D: Metabolism and Biological Actions, Helen L. Henry and Anthony W. Norman (Vitamins). Ultratrace Elements in Nutrition, Forrest H. Nielson; The Nutritional Biochemistry of Selenium, G. F. Combs Jr. and S. B. Combs; Dietary Intake and Bioavailability of Fluoride, G. Subba Rao (Inorganic nutrients). Nutrition and Biochemistry of Trans and Positional Fatty-Acid Isomers in Hydro-generated Oils, E. A. Emken (Lipids). Home Parenteral Nutrition (HPN), Lyn Howard and Ann V. Michalek; The Epidemiology of Vitamin A Deficiency and Xerophthalmia, J. M. Tielsch and Alfred Sommer; The Diagnosis and Treatment of Food Allergy, Fred M. Atkins and Dean D. Metcalfe; Calcium and Osteoporosis, Louis V. Avioli (Clinical nutrition). Protein and Energy Nutrition During Lactation, D. A. Sampson and G. R. Jansen (Maternal/infant nutrition). Newer Laboratory

Methods for Assessing Nutriture of Selected B-Complex Vitamins, H. E. Sauberlich (Methodology). Nutritional Energetics of Animals, R. L. Baldwin and A. C. Bywater (Energy metabolism). Adverse Effects of Excessive Consumption of Amino Acids, N. J. Benevenga and R. D. Steele (Nutritional Toxicology and Pharmacology). Nutrition of the Domestic Cat, A. Mammalian Carnivore, M. L. MacDonald, Q. R. Rogers and J. G. Morris (Comparative nutrition). Effects of Nutritive Factors on Metabolic Processes Involving Bioactivation and Detoxication of Chemicals, F. P. Guengerich (Diet, nutrition and metabolic regulation).

A list of related articles from other Annual Reviews series is also provided.

Students and research workers interested in basic mechanisms and new methodologies will find this volume particularly interesting. There is plenty of useful information for clinicians and applied nutrition workers as well. The animal scientists will enjoy reading the chapter on Nutrition of the domestic cat.

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**Sulphur Research and Agricultural Production in India** by H. L. S. Tandon, (Published by Fertiliser Development and Consultation Organisation, C-110, Greater Kailash, New Delhi 110048, pp. x + 70, 1984, Price: Rs 60/-, Regd post: Rs 65/-, Foreign: \$12.00, Airmail: \$18.00.

Agriculture in India has been under rapid modernisation over the past three decades. India is reported to be fourth largest user of chemical fertilisers and other agricultural chemicals. Nitrogen, phosphorus, potassium, sulphur and zinc have been well recognised as the essential nutrients for plants and for improved crop yield. However in India the importance of sulphur has not been fully recognised and as such only in a few cases sulphur is included in fertiliser recommendations. Deficiencies of sulphur in Indian soils are serious enough to act as a constraint and could hold back the otherwise well planned efforts in agricultural development.

It is only recently that the causes of sulphur deficiency and crop responses to sulphur applications are being reported from different parts of India. Hardly there are 200 papers covering such studies where crop response for sulphur applications have shown decided advantages and these include edible oil seeds, cereals, legumes, tubers and forages. The 70 page booklet under review appears to be the first major publication which brings out a picture about the current status on this vital subject under the following headings: Sulphur and plant growth, Sulphur in soils and areas of deficiency, Additions, removals and Balance sheet of S, Crop responses to sulphur application, Yardsticks of yield gains and economics, Sulphur management for high yields, sulphur-containing fertilisers, Some areas for further research. Appendix (I) gives the crops mentioned in the text and the references include 180 papers. A lot more work has to be done covering areas such as survey, soil testing, study on the wider application of sulphur in agriculture and sulphur management in the country. We agree with the author who observes that "It is hoped that this review will contribute towards a better appreciation of the role of sulphur in Indian Agriculture".

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**Modern Crystallography III: Crystal growth** by A. A. Chernov. With contributions by: E. I. Givargizov, K. S. Bagdassarov, V. A. Kuznetsov, L. N. Demianets and A. N. Lobachev. Springer Series in Solid State Sciences-36. (Published by Springer-Verlag, Heidelberg, Germany), 1984, 244 figures, 517 pages; DM154/-

Practical needs for fundamental investigations on the properties of solids as well as for technological applications, necessitated the growth of single crystals in the laboratory. The preparation of synthetic crystals made tremendous strides into many areas of human endeavour from electronic to mechanical applications and even to jewelry. Research on new materials with special properties and the development of modified techniques for producing single crystals of these materials became a common feature of the present day solid state science. Simultaneous develop-

ment of the theories on crystal growth has been inevitable. It brought crystallography nearer to chemical thermodynamics and kinetics. There emerged one of the active branches of contemporary science, called crystal growth. The more we understand about the real crystals with their inherent defects and deviations from the ideal structure, the closer we approach to the problems of interface stability during crystal growth. Although, theoretical and experimental studies on nucleation and growth processes draw on the advances in physical chemistry, the practical production of single crystals with high perfection continues to have a large fraction of art than logical science. Efforts have been continuing in minimising the unpredictable parameters and bring them into a consistently systematic frame work. This book is another attempt in presenting the principles of crystallisation phenomenon and the experimental techniques for growing single crystals.

There are two parts: the first part is the theoretical analyses of nucleation and growth processes, while the second part deals with the techniques. Starting with the phase equilibrium relations, the first chapter develops the concept of surface energy from atomic point of view and the behaviour of crystal interface to varying equilibrium environments. Homogeneous and heterogeneous nucleation processes are explained in the next chapter using atomic cluster model. The thermodynamic and kinetic aspects of epitaxy is briefly presented. Various growth mechanisms and the effect of impurities on growth processes are discussed in the next two chapters. Mass and heat transfer during crystallisation and their effects on growth shapes and interface stability are detailed in the fifth chapter. Incorporation of defects during crystal is inevitable and is the subject matter of the chapter that follows. Fundamental problems in mass crystallisation are presented in chapter 7.

The part 2 of this book is on the practical aspects of crystal growth and is divided into three chapters: growth from the vapour phase, from solutions and from the melt. The vapour phase growth includes chemical vapour transport and physical vapour deposition as well as the V-L-S process. Growth from solution mostly devotes space to low temperature aqueous solution growth and the hydrothermal technique; very limited is the presentation of the flux method. Better presented is the physicochemical aspects and principles of various melt solidification, leading to single crystals.

The treatment in this book is well-oriented towards physical chemistry. In this respect, it stands unique

when compared to most other books on crystal growth; it is a welcome feature. Though the authors have expected that the book will be of use to readers with no specialised knowledge, the contents are not that basic to be useful for undergraduate students. No doubt, this book presents the principles of crystallization and growth phenomenon from the thermodynamic and chemical kinetics stand point. However, it falls short on many a practical aspects essential for those contemplating on crystal growth, such as generation and maintenance of high temperature and high pressure, zone refining and allied techniques, methods for assessing crystal perfection and others. Finally, the language, in many a section, contains uncommon usages and phrases, implying inadequate editing of the translated version.

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**Karnataka Weather Guide** by D. Krishna Rao,  
(Published by D. Krishna Rao, Margosa Lodge,  
Krishnaraja Boulevard, Chamarajapuram, Mysore  
570 004), 1984, pp. 36, Price Rs. 12 (Postage extra).

This is a booklet which gives the climatological features for the state of Karnataka in the form of monthly maps with appropriate explanatory notes. The weather parameters whose spatial variations over the state are depicted for each month are: (i) rainfall including number of rainy days and coefficient of variation; (ii) maximum and minimum temperatures;

and (iii) relative humidity for morning and evening hours. Except for rainfall amount for which iso-lines of spatial variation are given, most of the other parameters are presented as numerical values against some 20 station locations distributed over the state. Small maps of India showing distribution of mean sea level pressure and surface winds are also given for each month. Maps showing isolines of dates of onset of the monsoon over different parts of India and tracks of cyclonic storms in the Bay of Bengal and the Arabian sea for the months of May, October, November and December which may affect the weather over Karnataka in these months are also incorporated. The last few pages of the booklet are devoted to a detailed presentation of the surface and upper air climatological features of Bangalore. The material presented here includes diurnal variation of rainfall, temperature, relative humidity, surface winds and comfort index for the station.

This booklet will be useful to those interested in the weather and climate of Karnataka. It can also serve as a teaching aid in schools in the State. It is seen from the preface that for use in schools the author is bringing out a Kannada version. Unfortunately, the booklet contains errors and misprints not all of which are listed under 'Errata' on the last page. For instance on p. 23 it is stated that for Bangalore "the mean maximum temperature is 300° or more . . .". No doubt the errors and misprints would be rectified when the booklet is revised and reprinted. The design of the front cover page is attractive and informative. However, the price of Rs. 12 appears too high.

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