REVIEWS

Metamorphic Textures. By Alan Spry. (Pergamon Press). First Edition 1969. Reprinted 1979. Pp. viii + 350. Price : Hard Bound $ 17.75; Paper Bound $ 9.00.

Textural studies have assumed great importance in recent years in our quest for knowledge on petrogenetic processes. Recently, 'spinifex' and 'quench' textures have revolutionised our understanding of ultramafic and mafic lavas. There is a raging debate on the origin of 'variolites'. Viewed in this context, the present book on metamorphic textures is an important contribution. This book, first published in 1969 and reprinted thrice since, has applied the recent advances in the field of metallurgy and ceramics to the problem of textures in metamorphic rocks. The book therefore lays a strong foundation for the pursuit of advanced interests in metamorphic textures. This book is illustrated with typical examples and presented in readable style. Chapters 1 to 6 provide adequate theoretical background and Chapters 7 to 10 describe the common textures in thermal, dynamic (shock) and regional metamorphism, concluding with Chapter 11 on polymetamorphism.

The rapid strides made in metamorphic petrology in recent years call for an urgent revision of text and updating the list of references. For example, there is a controversy on the genesis of bladed olivine, which is reported from plutonic, metamorphic, spinifex and cumulus textures. There are newer attempts at evaluation of textures in granulites. These problems could be discussed when revising the book. The value of the book would be enhanced by illustrations on progressive metamorphism from the original igneous and sedimentary textures. Much of the publicised recent examples from Greenland would be a welcome addition. Another useful addition would be a study of textures of metamorphosed volcaniclastic rocks (tuffs and tuffaceous rocks). Arrangement of the illustrations close to the relevant text will greatly improve the ease of reading. Notwithstanding these suggestions for further improvement, the book in the present form is eminently suitable for libraries. It is an ideal text for the postgraduate student in geology and valuable reference book on metamorphic petrology.

M. RAMAKRISHNAN.

A History of the Indian Council of Agricultural Research. By M. S. Randhava. (Indian Council of Agricultural Research, New Delhi 110 001), 1979, Pp. xvi + 496, Price : Not given.

This is a document tracing the growth of the Indian Council of Agricultural Research during 1929-1979. The Council was known as Imperial Council of Agricultural Research during the pre-Independence days. The fifty-year history of the Council is covered in this about five hundred page treatise in an authentic manner. It was superbly fitting when the book was released on the occasion of ICAR's Golden Jubilee celebration in the nation's capital in September this year.

The history covers the steps taken by the successive governments to strengthen agricultural research and development programmes in the country. Very authentic information on this is given in the first 14 chapters.

The Chapters 15 to 26 give historical accounts of the setting up and growth of the various agricultural research institutes under the ICAR. The Chapters 27 to 30 give a detailed account of the growth of Agricultural Universities under the patronage of ICAR. While the Chapters 31 and 32 deal with Research in crop sciences and soils, respectively, animal sciences and fisheries research are covered under the last three chapters. In covering the growth of the various Research Institutes under the chapters, the growth of research in the respective areas are also fully covered.

The Appendix I makes an interesting reading of the notes and documents touching various important stages of growth of ICAR. The Appendices 2A and 2B list the Presidents, Vice-Presidents and Secretaries of the ICAR, along with their bio-data. The other five Appendices are of some academic value. There are 80 text-figures, all of them photographs, representing different areas of activities covered by the ICAR.

The book is a valuable document in the hands of agricultural scientists in the country. It is said 'the past would influence the future'. By knowing the past through this book, the agricultural scientist should be able to do better than what he is doing presently. Dr. M. S. Randhava, an eminent administrator-*cum*-scientist, with his rich experience in various fields covering a wide spectrum from fine arts to architecture has a flare to write books and this one reflects not only his ability to put things together as a document but also his intimate knowledge and attachment to

the subject of agricultural research, education and development.

G. RANGASWAMI.

Annual Review of Plant Physiology. Vol 30, 1979.

In this volume of the *Annual Review of Plant Physiology* (Vol. 30, 1979) there are 20 papers by various authors broadly classified under the heads (*a*) Molecules and Metabolism, (*b*) Organelles and cells, (*c*) Tissues, organs and whole plants and (*d*) Population and environment. Besides, the prefatory chapter on 'Fifty Years of Photosynthesis' is written by C. S. French.

The prefatory chapter 'Fifty Years of Photosynthesis' by C. S. French is an interesting autobiographical sketch. The importance and the need for knowledge in physical sciences for biologists and plant physiologists in particular is well brought out.

The paper on 'Facultative Anoxygenic Photosynthesis in Cyanobacteria by E. Padan deals with the position that Cyanobacteria occupy in the phototrophic world. Both the oxygenic photosynthesis on the one hand and facultative anoxygenic phototrophic capacity on the other, permit cyanobacteria to occupy an intermediate ecological and physiological position.

The sulfated polysaccharides of brown algae, the structural elements which constitute 70% of the dry matter of some red sea weeds are reviewed in the paper "Sulfated Polysaccharides in Red and Brown Algae" byE. L. McCandles. The biological and environmental factors affecting sulfated polysaccharides and the biosynthesis of these compounds are reviewed.

The paper on 'Roles of a Coupling Factor for Photophosphorylation in Chloroplasts' by R. E. McCarty emphasises more on the structure and properties of coupling factor–1 than on the importance of coupling factor as a key component participating in photosynthetic photophosphorylation. The important development in this area is based on Peter Mitchells chemosmotic theory of oxidation and photosynthetic phosphorylation. The location of CF on the chloroplast membranes, the chemical composition of different submits, the type of bonding with nucleotides and, ATPase enzyme complex of CF are discussed.

In the paper 'Enzymic Controls in the Biosynthesis of Lignins and Flavonoids' by K. Hahlbrock and H. Grisebach, the biosynthetic pathways and the enzymatic controls for synthesis of lignin, flavonoids and cynamate esters are discussed. This article provides very useful information on one of the most important and abundantly present plant component of the lignin.

In the article on The Central Role of Phosphoenolpyruvate on Plant Metabolism by D. D. Davies, the importance of PEP as a key intermediate not only in carboxylation step in C-4 and CAM plants but also in many other plant processes such as synthesis of lipids, fruit development, control of pH and synthesis of phenyl proponoid compounds are discussed. The article integrates very succinctly the metabolic role of PEP.

The article on 'The Role of Lipid-linked Saccharides in the Biosynthesis of Complex Carbohydrates' by A. D. Elbein deals with the importance of the lipid-linked saccharides, their role and biosynthesis. The significance of many glycoproteins present in plant parts are discussed. Mannose rich lipid-linked oligosaccharides, mode of transfer of oligosaccharides to proteins and the role of some of the antibiotics like bacitrassin and amphomycin are discussed. The article should be of particular interest to physiologists working on physiological aspects of pathology. The paper on 'Biosynthesis of Terpenoids' by T. W. Goodwin discusses the recent work on the biosynthesis of sterol and carotenoid biosynthesis in plants and microorganisms. Work on the regulation and control of sterol and terpenoid synthesis is reviewed.

'Polysaccharide Conformation and Cell wall Functions' by R. D. Presten includes the nature of the polysaccharides and the proteins present in cell walls. Besides, the linkages betwcen carbohydrates and the models are provided. The importance of these in cell wall extension and other functions are dealt.

'Microbodies in Higher Plants' by H. Beevers essentially deals with various aspects of microbodies in plant cells. Of particular interest is the differences in the glyoxisomes present in fatty seedlings and leaf peroxisomes. The enzyme composition of these different microbodies are discussed. Particularly interesting is the biogenesis and development of microbodies.

'Intracellular pH and its Regulation' by F. A. Smith and J. A. Raven deal with the importance of H^+ transport across the membrane in the regulation of pH in the cells. The metabolic implications of the pH regulation through enzyme action and changes brought about are discussed. Also the importance of pH regulation on stomatal turgor mechanisms, carbon metabolism in C_4 and CAM, nitrogen assimilation and in plant cell development are discussed.

The paper 'DNA Plant Viruses' by R. J. Shepherd deals with the biological, a physical and chemical properties of two main groups of viruses Caulimoviruses and Geminiviruses, which are different biologically and biochemically. The advantages of using Caulimoviruses for recombinant DNA experiments are discussed.

The article on 'Plant Cell Fractionation' by P. H. Quail deals with marker concept. An analysis was made to define unique markers of specific subcellular components and thus determine localisation of biochemical reactions.

The paper on 'The Cell Biology of Plant Animal' symbiosis by R. K. Trench deals the mutualistic symbiosis in relation to the location, tissue specificity and morphological modifications of the host or parasite.

The article on 'The Structure of Chloroplast DNA' by J. R. Bedbrook and R. Kolodner deals with physical and genetic structure of chloroplast genome. The chloroplast genome is represented by the sequence of a single circular Ct DNA molecule.

The paper on 'Fusicoccin: A Tool in Plant Physiology,' by E. Marrè deals with the mechanism of action with particular reference with electrogenic H^+ extrusion. Most of the obserfed effects of Fusicoccin are interpreted as consequences of the primary direct activating effect on H^+ extrusion and on the hyperpolarisation of potential differences. This paper and the paper on intercellular pH and its regulation are mutually complementary and helps in understanding the role of pH in bioenergitics.

The paper on 'The Control of Vascular Development' by T. L. Shininger highlights auxin and sucrose as essential stimuli for vascular tissue development.

The paper on 'Biosynthesis and Action of Ethylene' by M. Lieberman deals with biosynthetic aspects of ethylene mode of action at molecular level and role of ethylene in growth.

With regard to the growth and development, it is suggested that ppb levels are more effective whereas ppm levels are inhibitory or antagonistic.

The paper also deals with the possible location of the ethylene synthesizing systems.

In the paper on 'Physiological Aspects of Desiccation Tolerance' by J. D. Bewley, importance is given to the drought tolerators. The authors are of the opinion that tolerance is protoplasmic and drought tolerance ability is dependent upon (*a*) to limit to the damage to desiccation. (*b*) to maintain physiolcgical integrity in the dry state so that metabolism can be reactivated cr rehydration and (*c*) to put a repair mechanism on rewatering. The article is of great value to those interested in stress physiolcgy.

'Explanatory Models in Crop Physiology' by R. S. Loomis, R. Rabbinge and E. Ng describe the importance of research on Crop Physiological aspects comprising of crop canopies. Models on crop canopies, their importance and limitaticns in productivity are discussed.

This volume of the Annual Review as in previous years contains very useful information, valuable to Plant Physiologists, Biochemists and Scientists of related disciplines. The book is a must in all Libraries where biological sciences form an integral part of study or research,

K. S. KRISHNA SASTRY.

AWARD OF RESEARCH DEGREES

Kakatiya University, Warangal, has awarded the Ph.D. degree in Mathematics to Shri P. V. Narasimha Rao, Ph.D. degree in Physics to Shri M. A. Waheed Khan and Shri K. Srimannarayana; Ph.D. degree in Bio-physics to Shri A. Aravind Babu; Ph.D. degree in Chemistry to Miss Vijaya Lakshmi; Ph.D. degree in Botany to Sri V. V. L. N. Sarma; Ph.D. degree in Zoology to Shri P. Dayakar, Sri. G. Raghu Ramulu, Shri. M. R. Gopala Reddy and Shri G. Madhusudhan Rao.

Karnatak University, Dharwad, has awarded Ph.D. degree in Physics to Shri C. S. Anithkumar.

Karnatak University, Dharwar, has awarded the Ph.D. degree in Chemistry to Shri Karajagi Gururaj Vasantrao; Miss M. N. Balse, Shri Sohar Maruti Honnappa and Shri Havanur Shambhaling Basappa, Ph.D. degree in Anthropology to Shri A. V. Arakeri and Shri Bhat Urishna Villemane.

Osmania University, Hyderabad, has awarded the Ph.D. Degree in Physics to Shri Adeel Ahmad.

Berhampur University, has awarded the Ph.D. degree in Mathematics to Shri Devaraj Khandunalo; Ph.D. degree in Zoology to Miss Kalyani Das and Shri Suresh Chandra Patnaik.

Mahatma Phule Krishi Vidyapeeth, Rahuri, has awarded the Ph.D. degree in Cytogenetics and Plant Breeding to Shri S. S. Mehetre.

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