BOOK REVIEWS

Introduction to embryonic development by Steven B. Oppenheimer. Allyn and Bacon Inc. Boston, USA, pp 1980, 404 (pb), $ 8·50.

A major unsolved problem in biology is the molecular mechanism of differentiation or morphogenesis. All sexually reproducing organisms start their life history from a single cell—the zygote-and by division and differentiation generate the multicellular adult form with different organs and tissues performing various functions co-ordinately.

This book tries to depict our current state of knowledge about the processes and mechanisms underlying such developmental patterns both at the morphological and molecular levels. The organization of the various chapters (13 in number) and the development of the various concepts presented here are highly commendable in terms of introducing this important subject to the beginner. Relevant technical words are defined clearly and are marked in bold face in the spacious margin when they appear for the first time. This should be very useful in conjunction with the glossary presented at the end of the book. The scanning electron micrographs reproduced are the hallmark of this book.

Steven Oppenheimer has given an informative account of the human embryo as well, bringing to focus the lacuna in our knowledge in this vital area of embryology. The illustrative descriptions of the developmet of sea urchin, amphioxus, amphibian and mouse embryos provide a fund of information in comparative embryogenesis. Even a section on the developmental life history of plants is included to emphasize unity amidst diversity. Description of the ontogeny of various specific organs and tissues comprise a good portion of the book. The molecular mechanisms of morphogenesis are dealt with in subsequent chapters culminating in an interesting one on cancer and embryology. Although a hotly debated topic, the author compares the various similarities between embryonic and cancer cells.

A brief account of the history of the development of concepts in embryology and about famous early embryologists would have been appropriate in this introductory volume. Further, an emphasis on embryology from an evolutionary standpoint is also lacking. One is here reminded of the famous biogenetic law or the recapitulation theory of Ernest Haeckel, which states that " ontogeny recaptulates phylogeny "—the developmental life history of a higher form of life repeats or recaptures the adult life of lower life forms. Apart from these minor ommissions, this text should serve as an excellent introduction to every student of biology.

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• **Ferns and fern-allies of Meghalaya State, India** by A. K. Bajshya and R. R. Rao. Scientific Publishers, Jodhpur, 1981, Rs. 100, U.S. $ 20.

This book affords a glimpse into the vast botanical riches of Meghalaya in N.E. India, The heavy rainfall and mountainous terrain of this remote part of India help in making an ideal habitat for Pteridophytes. The 256 species reported by the authors form a large share of the approximately 600 species reported from the whole country.

Updated nomenclature, brief descriptions, distributional and ecological notes are clearly presented. The bibliographic references, indices and identification keys to families, genera and species add to the value of the book. Of the 37 illustrations, some are photographs and others composites of photographs and line drawings. The latter are clearer and more helpful. The introduction (pp. 1-16) briefly reviews previous work on the Pteridophytes of this region and situates them in their ecological setting of tropical and temperate forests.

The book would have been more presentable had the authors found time to go through the galley-proofs themselves. A single page (84) selected at random has seven errors Although there is a page of *errata*, mistakes have crept into the corrections.

A useful book both for the Pteridologist and general botanist. A worthwhile addition to the series on the floristics of North East India from the North Eastern Hill University.

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Timber—its nature and behaviour by Dinwoodie Van Nostrand Reinhold Company Ltd., Molly Millars Lane, Wokingham, Berkshire, England, 1981,pp, X + 190, £ 5·50.

Timber has been used by mankind since times immemorial for one purpose or the other in its natural form. It was so perhaps due to the fact that it is light in weight and could be worked with ease compared to other available materials like stone, iron etc. During the course of time it has been established that timber is almost 5 to 6 times stronger on weight for weight basis. Also it has many other virtues like low initial cost, high salvage value, high electrical resistance and above all it is a renewable resource. On the other hand, timber possesses many weaknesses, *i.e.* lacks dimensional stability, easily inflammable, prone to attack by various wood destroying biological agencies such as termites, borers, fungi, etc. Lot of research work has been going on in various parts of the world including India with a view to understand the virtues and weaknesses of this inexhaustible resource—timber. Many technical books are already available in various libraries on the subject but a need is continuously being felt to disseminate this knowledge in a simple way to common user of wood as also to the industries who

process wood into various useful materials. The book entitled 'Timbe—rits nature and behaviour' by Dinwoodie appears to be very handy to fill in this gap. This contains almost all the information which can be of some use for not only to illiterate section of wood industry but also to the students of engineering colleges.

The book consists of 7 chapters covering 190 pages.

In Chapter 1 the author has dealt with different kinds of structures, namely, macroscopic, microscopic, molecular and ultra structures of wood. In addition to these, variability in structure affected by environment has also been mentioned. Its effect on density and its consequential effect on the strength property of wood and its use thereafter has also been briefly described. The chapter serves as real help and practical guide to beginners in this field.

In Chapter 2 the movement of moisture held by green timber and its consequent effect on the properties of wood have been well discussed. Regarding methods of drying, *i.e.* seasoning of wood no mention has been made about solar seasoning which is very important in today's technology not only to utilise the solar energy but also to conserve other conventional sources of energy.

Chapter 3 deals with flow in timber. The terms such as viscous or laminar flow, turbulent flow, and molecular diffusion are self-explanatory with mathematical relationship.

Chapter 4 considers deformation under stress. In addition to elastic stress such as M of E, modulus of rigidity and Poisson's ratio, the othotropic elasticity is well explained with simple mathematical relationships. The viscoelastic behaviour is simple in presentation and is illustrative too.

Chapter 5 discusses various strength properties of timber which play an important role in its utilisation for various purposes. Factors affecting the strength properties have also been well discussed and interrelationship between them also is mentioned. The author has elaborately and explicitly dealt with the influence of moisture, actual defects, etc., on the viscoelastic behaviour of timber and other strength characteristics.

Chapter 6 deals with various physical, chemical and biological agencies that cause deterioration of timber and consequently affect its service life. A mention has also been made about various materials naturally present in the timber which offer resistance to such deterioration.

Another important aspect that has been dealt with is the damage caused to timber due to fire. The mechanism of thermal degradation, the critical ignition point, the process of transpirational cooling and its effect in protecting the unburnt portion of timber and the rate of spread of flame after inset of initial ignition have been covered in this chapter. The method of evaluating the performance of timber in fire have also been briefly mentioned.

Chapter 7 deals with the processing of timber. The section on mechanical processing deals with sawing and planing, bending, board materials, laminated timber and mechanical pulping. The effect of density, moisture content and the presence of gums, resins, and other mineral inclusions in different species of timber on the sawing and planing of different species of timber and the cost of processing have also been discussed in detail.

Techniques for the manufacture of plywood, chipboard and fibre building boards which possess higher dimensional stability and lower anisotropy compared to solid wood have been dealt with in considerable detail. A brief mention has been made about mechanical pulping of timber for the manufacture of newsprint.

Protection of non-durable timbers by impregnation with wood preservatives of different kinds, the advantages and disadvantages have been touched upon to give a general overall picture of various aspects. Application of fire-retardant chemicals to reduce the natural inflammability of wood, protection of timber to increase its dimensional stability, mechanical pulping for manufacture of high quality paper have also been discussed in this chapter in a very simple language.

The book as a whole is a logical and coherent presentation of the subject-matter by the author which would lead the students for better understanding of wood as a material. There is a paucity of books on timber technology at elementary level and this book meets the requirements to a considerable extent.

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