

than those of conventional microscopy. Refined criteria of differentiation provided by biochemical analysis, great advances in *in vitro* technique, together with sophisticated kinetic methods and the electron microscope have, in the past two decades, provided opportunity for the re-examination of growth and development in a more objective way than was possible when the dogma of histology was laid down. In this volume topical reviews demonstrating "the bearing of different lines of thought and experimentation" on the nature and properties of the differentiated cell have been collected together.

Chapters by Holtzer and Abbott, Lash, Whittaker, Hauschka, and Cahn deal with the results of *in vitro* methods, principally on cartilage, retinal pigment and muscle cells, and while each author tends to his idiosyncratic interpretation, it is made exhaustively clear that biochemistry provides a more sensitive index of similarity or difference between cell populations than does morphology, and that growth density and the immediate microenvironment are paramount in enabling a cell to maintain a manifest specialized activity. Rapid DNA synthesis and continued production of differentiated product are not always incompatible, and differentiation can be freely reversible in a cell line, but the controlling conditions have not yet been analysed in precise molecular terms, though that day is clearly approaching.

In the last four chapters Hay, Burnett, Braun and Gehring turn attention to the situation *in vivo*. Metaplastic transformation of the "differentiated" cell seems in many cases to be replacing the old concept of the "undifferentiated" interstitial cells as a source of regenerating population. In these chapters, again, there is to be found evidence for the importance of the local environment in governing the morphology of the cell. Gehring's review of the work on determination in the imaginal disk is excellent in providing concisely the evidence that a very small number of switching events may trigger reversibly widely differing pathways of phenotypic expression.

This book is the first of a series of such reviews. In most chapters, the intensive style of presentation means that, to get much out of it, the reader should be well versed beforehand in the problems covered. In spite of the unifying theme, one wonders whether a brief editorial preamble surveying the problems might not make the content more widely digestible. The volume is very well produced, and only at the foot of page 75 does one feel that complexity of presentation has run away with someone. I look forward with interest to the appearance of companion volumes.

R. PRESLEY

FLOWER ORIGINS

Flowering Plants

Origin and Dispersal. By Armen Takhtajan. Pp. vi + 310. (Oliver and Boyd: Edinburgh, June 1969.) 50s.

To judge by the number of major works that have been published recently, these are exciting times for botanists concerned with the major systematics of flowering plants. Following closely on Cronquist's *Evolution and Classification of Flowering Plants* (reviewed in *Nature*, 221, 293; 1969) comes an important volume by the leading Soviet plant taxonomist and morphologist, Professor Armen Takhtajan, which is an extensively revised and amplified translation of the second edition of his *The Origin of Angiospermous Plants* (Moscow, 1961). As the title indicates, it is concerned not only with the origin of the angiosperms but with their dispersal in time and space.

After a somewhat pedestrian introductory chapter, reminiscent of germanic-style lectures students used to suffer decades ago, the pace warms up in the two and a half pages of chapter two, where the author comes out strongly against the polyphyletic origin of the flowering plants. No new evidence is adduced and, as the preface

indicates, readers interested in other current arguments on the origin and evolution of the angiosperms should consult the works of Croizat, Lam, Melville and Meeuse. The difficulty or even absurdity of trying to derive the Urticales, Fagales and similar groups from the magnoliatype of organization that Croizat highlighted in a recent review, and which follows from insisting on a monophyletic origin, is not convincingly answered by pointing to the Hamamelidales as a linking group, although further arguments are put forward in a later chapter on the origin of the apetalous dicotyledons.

By a process of elimination, the author arrives at the not unsuspected conclusion in chapter three that the angiosperms arose from some ancient group of gymnosperms with a primitive secondary xylem of scalariform tracheids and primitive bisexual strobili. The next two chapters cover such topics as the probable upland origin of the flowering plants and the bearing of population genetics on such an origin, and a detailed and valuable discussion of the role of neoteny in evolution and of the relationship between insects and angiosperm flowers.

Chapter six is devoted to a detailed hypothetical reconstruction of the first flowering plants in terms of vegetative organs, anatomy, floral structure and karyotype, while chapter seven gives a survey of present-day angiosperms which display many primitive and archaic features (mainly Magnoliales, Laurales, Trochodendrales). Both these chapters are well documented and up to date.

The origin of the monocotyledons is discussed in chapter nine and there then follow six chapters on palaeobotanical and historical phytogeographical problems which form the most original and rewarding part of the book. A valuable feature is the frequent and extensive reference to Russian literature not otherwise familiar to the western reader.

There are two large appendices, the first being an annotated outline of the classification of flowering plants based on Takhtajan's 1967 system (published in Russian) with some changes at the ordinal and family levels. This system differs in many ways from those recently published by Soó, Cronquist, Thorne and others, although there are some basic resemblances. The second appendix is a summary of the floristic regions of the world with an accompanying map. There is an extensive bibliography and a fairly detailed index. The text is attractively and clearly printed and illustrated with line drawings and twelve pages of well chosen plates.

The translator, C. Jeffrey, has done his job well and placed us in his debt. Although the book still has a foreign-sounding ring to the British reader, this is largely due, I suspect, to the style of the original, the occasional use of uncommon terms and the unfamiliar subject matter of some of the latter half of the book.

This is a valuable and important book which deserves to be widely read. Teachers of systematics and phytogeography will find it invaluable, while their students, particularly the more advanced, will benefit from having detailed information on angiosperm origins and evolution brought together in a readable form.

V. H. HEYWOOD

NEUROLOGICAL DISEASES

The Central Nervous System

Some Experimental Models of Neurological Diseases. Edited by Orville T. Bailey and David E. Smith. (International Academy of Pathology Monograph.) Pp. xiii + 364. (Williams and Wilkins: Baltimore, 1968. Distributed in the UK by Livingstone, Edinburgh.) 170s.

THE cover title is simply *The Central Nervous System* and is misleading. The book is, in fact, mostly about neuropathology, contained in some twenty-one chapters. Several of the studies involve the use of the electron