Animal chromosomes

Animal Cytology and Evolution. By M. J. D. White. Third edition. Pp. viii+961. (Cambridge University: London, June 1973.) £19; $55.

WRITERS of general accounts of chromosomes before Professor White used to attempt to cover both plants and animals. This policy was justified by the uniformity in principle and also by the complementarity in detail of the two kingdoms: the chromosomes of plants were more useful in showing the causes of evolution; those of animals revealed above all its consequences. Or, to put it in another way, the immense range of experiments, chemical and physical, genetic and physiological, that have been successful with plant chromosomes provide quite a different picture from the descriptive variety which is revealed by a systematic survey of animal chromosomes.

Professor White was the first, in successive editions of this book, to try to disentangle the animals from the plants, the consequences from the causes. He took this course, no doubt, because the animals suited him extremely well. He is the most experienced specialist in animal cytology in the world and he excels in describing and illustrating the wealth of variation of chromosomes in their form and behaviour as they operate the multifarious genetic and developmental systems of animals.

Naturally Professor White has to refer to the principles of chromosome behaviour revealed by plants, but he does so reluctantly and piecemeal, lightly suspending his judgment whenever the issue becomes serious. Evidently he does not recognise the contrast or the complementarity between the opposed evolutionary aspects of chromosome study, and no one from reading this book could pick up any such disturbing notions. There are many students of chromosomes, to be sure, who will not want to be disturbed, and for them Professor White has provided a solid and satisfactory work of reference.

C. D. DARLINGTON

Scottish shores

The Coastline of Scotland. By J. A. Steers. Pp. xx+335 (64 plates). (Cambridge University: London, 1973.) £10.50; $31.50.

IT is now almost thirty years since Professor Steers's monumental work on the coastline of England and Wales appeared The natural sequel was a similar study of the coasts of Scotland and now, in retirement, he has, with characteristic thoroughness, set out his views on the form and origin of some of the finest coastal scenery in Britain. The book is cast in much the same mould as his earlier work with a few introductory chapters covering general themes to be followed by a survey of the whole coastline, including all the offshore islands. Inevitably he has drawn heavily on the work of others, for although he has walked over nearly all the coastline he describes, detailed studies of individual sections proved impossible.

Fortunately the geological memoirs of Scotland are particularly detailed as regards coastal sections and many of the early volumes, like that of Caithness, contain a wealth of physiographic information. There is, however, a general lack of research papers similar to those found in the local journals in England. In part this deficiency has been made good by the research efforts of Scottish geographers, particularly those based at Aberdeen. Professor Steers has used their studies to advantage in his text to provide local colour for what is basically a factual account.

Undoubtedly the book will prove of great value to the specialist but seems hardly likely to make easy reading for the amateur enthusiast with an interest in our coastal setting. It is to be regretted that Professor Steers has not felt able to draw upon his vast experience to be more speculative, not only posing problems but giving a lead as to their solution. For the island of Ailsa Craig, for example, he contents himself with a factual account of its geology and vegetation (pages 103–4) without real reference to the interesting ness feature which dominates its eastern coastline. Again in the entrance to Inverness Firth he makes detailed reference to the classic work of Ogilvie, carried out over fifty years ago, when the relative roles of tidal currents and wave action were appreciated for the first time. Since then much new evidence has been forthcoming on this important aspect of coastal evolution, particularly in relation to sediment transport by residual water movements. This is a theme which Professor Steers could have properly developed without recourse to detailed research, for the evidence is there in the bottom configuration of the firth.

The book is well illustrated with maps. It has a centre spread of excellent photographs from the Cambridge University collection of air views, although as they do not occupy the full page size they give the book an old fashioned appearance. Inevitably a comparison will be made with his earlier book on the coastline of England and Wales. It is a sad fact that as book prices have risen steeply in the last few years the quality of production has declined.

A. H. W. ROBINSON

Sea urchin development

Development Biology of the Sea Urchin Embryo. By Giovanni Giudice. Pp. x+469. (Academic (Harcourt Brace Jovanovich): New York and London, August 1973.) $32.

THERE is a great need for more sympathetic communication between experimental embryologists and molecular biologists; and this book, by drawing together the enormous amount of information on the morphogenesis, ultrastructure, biochemistry and molecular biology of the sea urchin embryo, makes a timely and scholarly contribution towards this end.

For the reader with no formal background in embryology there is a lucid account of the experiments of the early 1900s that still provide the basis of current ideas about the programming of sea urchin development; for example, the proposed existence of gradients of potentiality to form ectodermal or endodermal structures emanating from the 'animal' and 'vegetal' poles of the egg respectively. There is fascinating reading, too, in the descriptions of sperm penetration, the behaviour of the male and female pronuclei, and the membrane changes following fertilisation—examples of phenomena which, as yet, have no molecular explanation.

The reasonably up to date summary of research on the sea urchin embryo from a more biochemical viewpoint contains a clear description of experiments which led to such ideas as the existence of 'masked' maternal messenger RNA, and the synthesis of large amounts of histone and histone messenger RNA by the early blastula. But this is a rapidly moving field and it is a pity that the book was finished (early 1972) before the application to the sea urchin embryo of important new advances in the technology of isolating and translating messenger RNAs (see, for example, *Nature*, **245**, 8; 1973) could be included.

Dr Giudice's book is also a useful source of practical information about handling embryos, separating cells, problems of permeability, and so on. It is clearly written, with paragraphs summarising the main problems to be solved and the information available. Beyond this synthesis, however, the author makes no attempts to provide new insights or theories. Finally, the reader is left in no doubt as to the disadvantages, as well as the advantages, of the sea urchin in studying problems of developmental biology, for Dr Giudice is no slavish devotee of his research material. The main disadvantage is, of course, that no genetic analysis of development can be made because it is very difficult to rear the embryos in the laboratory beyond the pluteus stage.

BRIGID HOGAN