is, however, quite different in concept and presentation, although both series have many authors in common. The contributors do not attempt the comprehensive literature survey provided by their counterparts in Evans *et al.*, but present helpful "how-to-do-it" instructions with a good selection of important references. A wide range of practical methods is covered in 85 short, easily read chapters and little difficulty should be experienced in following most of the methods given, although many of them appear deceptively simple. The style of text and layout is more attractive than its rival, and while the two series have much subject matter in common there are many topics specific to each. Because it appears less confusing this book will appeal more to the newcomer to the field, but once started the reader may well wish to refer to the more detailed account of the literature given in the Macmillan series. If the budget will stretch, there is sufficient difference in subject matter, style and content to warrant purchase of both sets of volumes. □

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After Olive

Brian Shaffer

The Dictyostelids.
By Kenneth B. Raper.
Princeton University Press: 1984. 453 alkaline pages. $97.50, £80.70.

ABOUT thirty years ago, the only slime moulds vaguely known to the average biologist were the myxomycetes. Since then the cellular slime moulds, which alternate between a unicellular and a multicellular life, have invaded even the elementary biology course as a paradigm of intercellular communication, adhesion and behaviour; and as waves of amoebae have swept in with what, not only in time-lapse photography but in real time, is such obliging rapidity, and then undergone binary differentiation in specific proportions to produce structures of specific shape, hundreds of biologists have been swept into studying them.

Aggregation in the larger species of dictyostelids is a relay system in which the central amoebae secrete an acrasin, which first attracts other cells and then induces them to secrete acrasin, so that they in turn attract and induce more peripheral cells. In some respects this is a model for much cultural transmission in human societies — the spread of technology, religions and isms, of FRS's and Nobel prizes. So it was perhaps surprising that it took quite a few years for my demonstration of this relay system to be generally accepted and for it then to induce further work on the relay mechanism. Be that as it may, Professor Kenneth Raper was clearly one of the two or three founders of modern research into cellular slime moulds. One can easily trace the transmission of his influence to many laboratories, often by the students he attracted who in turn attracted others.

Since 1930 Raper has studied morphological development and taxonomy, a number of his techniques remaining unchanged. Whereas many workers restrict themselves to whatever standard medium is currently in use, Raper has always been concerned with the minute details of the slime moulds' natural environments and the effect of cultural conditions on development and hence on features used in classification. The allocation of space in this book reflects this emphasis. Nearly half is devoted to systematics, much of it dealing with each species' requirements; and the rest of the book, which gives a synoptic view of development, contains large sections on occurrence, isolation, ecology, cultivation and culture maintenance. This leads to some duplication of material but the fullness of treatment could convince an amateur naturalist that without high technology he could still usefully contribute to slime-mould studies.

While several recent books have dealt with different aspects of slime moulds, this is the first account since E.W. Olive's at the turn of the century to give a comprehensive description of all known dictyostelids. Raper characteristically maximizes his predecessor's contributions, probably previously entirely unknown to most present-day workers. Throughout, he refers generously to his colleagues, correcting their errors gently without polemic — as well as acknowledging his own. He avowedly gives minimal coverage to biochemistry and genetics.

The chapter on macrocysts may seem overburdened with somewhat confusing details from the original papers, but this is the long-missed sexual phase which should be of great importance for genetic and developmental analysis if details of culture receive sufficient attention. (All but the most interlinear reader may be baffled by the phrase "macrocysts neither observed nor reported" repeated in descriptions of several species.)

In this era of the bestseller, in which interest is concentrated on a tiny fraction of the available range of a particular subclass of object — whether the class be books, films, records or species — it is no surprise that almost all work on the cellular slime moulds has been confined to a single species, *Dictyostelium discoideum*, discovered by Raper himself. Here he is trying to redress the balance. One hopes that his hawking a much wider range of species than are usually on display will tempt other researchers into working on them. □

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Physical chemistry of proteins

Wayne L. Mattice

Proteins: Structures and Molecular Principles.
By Thomas E. Creighton.
W. H. Freeman: 1984. Pp.515. $26, £28.95.

THOMAS Creighton aims this book at an audience with "a background in biology, with some knowledge of biochemistry, genetics, and cell biology". His readers are assumed to have no special expertise in the physical sciences.

Accordingly, six out of the ten chapters (about 75% of the book) discuss various aspects of the physical chemistry of proteins. These chapters — "Physical Forces that Determine the Properties of Proteins", "Conformational Properties of Polypeptide Chains", "The Folded Conformations of Globular Proteins", "Proteins in Solution", "Interactions with Other Molecules" and "Catalysis" — are clear and informative, and should prove interesting to the intended readership. Most of the remaining 25% is devoted to chapters entitled "Chemical Nature of Polypeptides", "Protein Biosynthesis" and "Evolutionary and Genetic Origins of Protein Sequences". As one expects of a book emanating from W. H. Freeman, the written word is supported by a great many illustrations of high quality.

Each chapter is copiously referenced, and the references are appropriate for the material presented. However, many of the papers concerned are at a level demanding a high degree of sophistication in physical chemistry, or a closely related field, and will be incomprehensible to a reader whose training is solely in biology.

The book contains occasional errors and contradictions. For example at one point it is asserted that dichloroacetic acid is a helix-supporting solvent. And in Chapter 5 it is stated that "Pro residues are incompatible with both the α-helix and β-sheet conformations", while the next chapter contains a table showing that Pro has a significant occurrence in both conformations. This contradiction could have been remedied by a short discussion of the role played by Pro at the amino terminus of helical segments and at the edges of sheets.

But the good points clearly outweigh the minor defects. For those with a biological background who would like to become familiar with the properties of proteins at the molecular level, Creighton's book will prove very helpful. □

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