

TMV is also a little out of place, being the only virus particle structure contribution; presumably all TMV papers were grouped together.

Several papers concern multicomponent virus. Jackson *et al.* provide a fine description of barley stripe mosaic virus (BSMV), a virus that promises more in the future than it has yielded so far. Surprisingly, however, its candidacy as a potential gene vector for monocotyledons is not mentioned. The bipartite CPMV (Goldbach *et al.*) is one of the best all-round understood plant RNA viruses apart from TMV. Its resemblance to picornaviruses is remarkable, and the embryonic results on 'resistance' in protoplasts (Kiefer *et al.*) look promising. CPMV features again in the papers on replicases (Darssers *et al.*) as does brome mosaic virus (BMV) described by Hall *et al.* Together these two articles summarize almost all that is known on the controversial subject of RNA-RNA replication in plants, but surprisingly without reference to Fraenkel-Conrat.

The curious involvement of plant viruses with maize mutations and transposing elements is dealt with by Mottinger and Dellaporta and Dellaporta *et al.* This could be a fascinating subject for further study, or a red herring. Virus infections cause a type of stress that could account for some of the interesting phenomena – I would doubt if the virus is analogous to an activator, but it is an interesting thought.

There is one contribution, by Nuss, on a plant reovirus, wound tumour virus, which has a double-stranded RNA genome, with a virion-associated transcriptase. Emphasis is on transcription and translation, again involving subgenomic RNAs. Cloning and manipulation of DNA copies is not yet achieved, but clearly the next step. The remaining short papers deal with viroids (small infectious unencapsidated circular RNA molecules) and virusoids (viroid-like RNAs with some characteristics of satellites of plant viruses). I am surprised there is not yet such an entity as a 'satelloid'! These nine papers provide an up-to-date picture of the state of the art. There is a slight tendency for researchers not to cross-reference each other's work, perhaps a sign of the competitive spirit in a fascinating area of research which is clearly now making rapid progress – except that the functions and pathogenesis mechanism of viroids, despite the excellent structural work, is still far from understood.

The papers are generally of a high standard and the organizers and editors are to be congratulated. £18.67 or \$26.70 is on the expensive side for a paperback, but CSH publications are usually worth it.

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Intercellular Communication in Leukocyte Function. Edited by J. W. PARKER and R. L. O'BRIEN. Chichester: John Wiley. £21.50. ISBN 0 47190 161 X.

This is a nicely produced book of a type that is almost completely useless. More than that, it is an active, though minor, nuisance. Immunology is a rapidly advancing field well served by numerous journals. In this context, one can identify two kinds of conference-derived book that may be valuable. (1) Records of small, usually specialized, meetings attended by well-chosen participants; they reproduce not only papers, but also the more fruitful parts of what should be extensive discussions; they aim to provide an up-to-date survey of a limited field, and provided they are published expeditiously, often do so. The symposium series of the Ciba and Benzon foundations, for example, conform to this pattern. (2) Carefully selected review papers based on the plenary or semi-plenary sessions of large congresses. Each of these will be written (with reasonable luck and good judgement on the part of the editors) by someone who knows what he or she is talking about; cumulatively, they cover a broad field and provide a work of reference that is valuable for two or three years. The Progress in Immunology series, derived from the triennial international immunology congresses, belong to this category.

The present volume has little to do with either of these categories. It contains a selection of the approximately 500 contributions to the 15th International Leukocyte Culture Conference held in December 1982. This series of conferences has proved remarkably successful since its inception in 1964 and the scope has broadened to encompass a large part of cellular immunology. Part of the 1982 conference was organized into six symposia which, in the words of the Preface, were designed to provide overviews in those areas in which the most rapid changes have been occurring in recent years. With that in mind, 'outstanding investigators' in each of the chosen fields were invited to speak. The scene was set, therefore, for the production of a useful Category 2 volume. Instead we have, loosely organized into twelve sections, a collection of about 120 mini-papers, each of which describes a small goblet of original work. Unquestionably, some of this work is of high quality. Unquestionably, too, determined browsing will uncover for almost everyone some tit-bits of interesting information, though whether this will be a recompense proportional to the time spent is more doubtful. But as a whole this book, like others of its ilk, is superfluous. Much of the information in it was either superseded or had appeared in the open literature before publication. All the abstracts had already been published elsewhere, and many of the papers are little more than abstracts themselves. It is a nuisance because it represents what is in effect restricted publication. Such books are too expensive for most individuals to consider buying. Many libraries, rightly in my view, regard them as a misuse of limited resources and prefer to buy journals. Yet they cannot be completely ignored; since they exist, people feel obliged to scan them and occasionally authors even refer to papers in them. The amount of scientists', editors' and publishers' time that has gone into the preparation of this volume is doubtless enormous and one wonders who benefits from it all.

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Hemoglobin. By RICHARD E. DICKERSON and IRVING GEIS. London: Addison-Wesley. £22.45. ISBN 0 8053 2411 9.

No family of proteins has been so thoroughly studied as the globins. A pin stuck into any issue of any biochemical journal published in the last 30 years would probably pass through at least one paper on the subject. With the rise of recombinant DNA technology, this intense interest has passed on also to the structure and organization of the globin genes.

It was initially the easy availability of the genes and their products which made them the targets for so much research, but this abundance largely reflects the biological importance of the globin system, so the attention has been well merited. There is no system in which the general programme of molecular biology – to explain biological behaviour on the basis of molecular structure – has come so close to completion.

Presented with this enormous mass of material it is not surprising that Dickerson and Geis decided in preparing a new edition of their well-known 'Structure and Action of Proteins' that the subject had outgrown a single chapter and merited a book of its own.

The main part of the book is in three chapters. The first is an account of the structure and function of myoglobin and haemoglobin, leading up to the Perutz mechanism and its more recent refinements and experimental tests. This account is extensively illustrated largely with coloured drawings in the familiar and very attractive Geis style. This chapter will be of great value to teachers of undergraduate courses; previously the best simple account of the Perutz mechanism was an article (also by Dickerson) which is now more than ten years old.

The final chapter in the book is concerned with human haemoglobin disorders – thalassaemias, sickle-cell disease, and a selection of the vast range of mutant haemoglobins.