

reprinted articles. The explanations are concise yet clear, summarizing the important developments and unsolved problems in a given area. Although the information is densely packed, the style maintains a flavour of informality. With liberal use of quotation marks, Zee writes about the "see-saw mechanism" of generating neutrino masses, and of the "lopsided" versus the "orthodox" pattern of symmetry breaking in the SO(10) grand unified theory. He also informs us, in a footnote attributed to Howard Georgi, that the SO(10) theory was actually discovered half an hour before the SU(5) theory. I am still trying to imagine how breathtaking a day that must have been.

Volume I is concerned mainly with the basics of grand unification, founded on the groups SU(5), SO(10) and E(6). This volume also includes a two-part "Instant Review of Group Theory", as well as chapters on proton decay, and on attempts to understand the existence of three families of fermions and to determine the fermion masses. Volume II begins with five chapters on cosmology, emphasizing the impact of recent developments in particle physics. Writing primarily for particle physicists, Zee begins with a short course on basic cosmology. The explanatory notes will be particularly useful to the beginner,

and the reprints include many of the classic papers of George Gamow and his collaborators. Subsequent chapters deal with the generation of the matter-antimatter imbalance, the theory of galaxy formation (with or without massive neutrinos) and the inflationary universe model. The remainder of Volume II includes accounts of dynamical symmetry breaking and composite models, as well as a brief discussion of the attempts to include gravity in the programme of unification.

A quality of the books which I particularly admire is the author's frank and unassuming tone. Zee points out that "the selection [of papers] assuredly reflects the author's idiosyncracies and the fact that while he has certainly not read every paper in the field, he has definitely read his own papers". (In fact, the books contain only six of Zee's articles, all of which seem quite appropriate to me.) In an effort to encourage the student who might be frightened by the vast volume of literature in this field, Zee points out that "it is not even necessary to read all the papers reprinted in this volume. This writer certainly hasn't". Nor, I confess, have I. □

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Basic methods

Roger Patient

Techniques in Molecular Biology.

Edited by John M. Walker and Wim Gaastra.

Croom Helm/Macmillan, New York: 1983. Pp.333. Hbk £19.95, \$29.95; pbk £9.95.

THE success of a textbook, like that of a lecture, is dependent upon a clear idea of the likely audience: the authors and editors of *Techniques in Molecular Biology* appear to have largely satisfied this important criterion. The main readers will be final-year undergraduates (especially project students) and postgraduates embarking on research. Established research workers will find most of the book familiar, but will value its presence in the laboratory when employing a new technique or when suffering one of those irritating failures of a technique which has been working for years. In addition useful tables and titbits of information are sprinkled throughout.

The scope of the book is fairly comprehensive, covering the separation and *in vitro* synthesis of proteins and nucleic acids, their transfer to solid supports and detection, determination of their amino acid or nucleotide sequences, and molecular cloning. Very little is considered too basic for inclusion: nick translation, for instance, gets a whole chapter. The information is well-organized and concisely

presented, with a lot of internal cross-references. In relation to other literature available, this publication intercalates quite nicely between *Molecular Cloning: A Laboratory Manual* (Cold Spring Harbor Laboratory, 1982), which contains an enormous amount of practical detail, and the *Genetic Engineering* series, published by Academic Press, which contains none.

Criticisms of the book centre on a very inconvenient way of listing references and a number of omissions or incomplete treatments of particular techniques. For instance, there is no good description of the direct application of nucleic acids to nitrocellulose and subsequent hybridization (the so-called "dot-blot" technique), and only cursory treatment of *in situ* immunassay techniques for screening bacterial recombinants. Occasionally, the information provided is actually misleading, as in the statement that ribonuclease-free deoxyribonuclease is available commercially (in practice, further purification is usually necessary before use). Finally, the problems associated with particular techniques are sometimes glossed over, as in the cases of M13 nucleotide sequencing, which has taken a number of laboratories a long time to establish, and assays of mRNA solutions using ³H polyuridylic acid, where problems with variability of polyadenylic acid tail length and reproducibility are often experienced. □

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Bangosomes: the past and the present

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Liposome Letters.

Edited by A.D. Bangham.

Academic: 1983. Pp.421.

£17.50, \$29.

Liposomes.

Edited by Marc J. Ostro.

Marcel Dekker: 1983. Pp.400.

SwFr.157, \$58.75.

Liposome Letters is a most unusual if not unique book, but that will not surprise those who are personally acquainted with the editor. In 1982 Alec Bangham wrote to some fifty scientists who have been concerned in one way or another with liposomes to suggest they send him informal letters, poems etc., that chronicle an anecdote, observation, hypothesis or comment about liposomes. His intention was that their offerings should recapitulate the developments and diversification of the liposome "membrane" model from its early days up to the present. In the preface he says that this formulation derived from a feeling that too much of our scientific writing is stereotyped, banal, platitudinous and devoid of all sensibility to the fabric of life in scientific research, success or failure. After just twenty years, I now realize why Alec considered my initial draft of a joint paper with him to be "pretty turgid stuff".

It is surprising what one can find in this volume. For example I see that in the preface by Papahadjopoulos, I and three other named villains are pilloried for apparently considering that he and Bangham were simply wasting their time in the early stages of work on liposomes. Then, Racker's chapter is punctuated by five Lessons, the last of which reads:

After you publish rejoice when other scientists don't believe what you know to be true. It will give you extra time to work on the phenomenon in peace. When they start claiming that they have discovered it before you, look for a new project.

His chapter ends with full-page photocopies of two letters, one from Racker to Bangham that reads "The answer to your question in your letter of March 1, 1982, is yes", and the other from Bangham to Racker replies "Thanks". Scherphof has contributed a witty three-page dissertation on how to pronounce the word liposome that includes a "Light-micrograph of the essential part of a Dutch technician caught in the act of preparing [blowing] an animal-size hemilamellar liposome (ASH-L). Bar is 1,0cm". The text says "For anybody watching this picture there cannot remain a shadow of doubt that a liposome is a LIP'əsōm', can there? From Groningen, with LUV, P.S. You should see her in full colour!".