Molecular Techniques in Taxonomy. NATO ASI Series H: Cell Biology, Vol. 57. G. M. Hewitt, A. Johnston and J. P. W. Young (eds), Springer-Verlag, Berlin. 1991. Pp. 415, hardback. Price £86.00. ISBN 3 540 51764 2.

This book is derived from a NATO Advanced Study Institute on molecular techniques in taxonomy which took place at the University of East Anglia in July 1990. The book is organized into three sections: overviews of topics in molecular taxonomy, case studies of the application of the methods, and laboratory protocols relevant to the overviews. There is a detailed review by Chris Simon on analysing mitochondrial DNA and his chapter on protocols is extensive and includes a valuable list of PCR primers. I enjoyed the chapter on DNA fingerprinting for studying family structure in birds (by Parkin & Wetton) and the lucid discussion by Brookfield of the statistical interpretation of hypervariable DNA in forensics. The chapter by Doyle and Doyle covers plant (mainly legume) systematics and the problems presented by multigene families. The other overviews are less satisfying. The obligatory chapter on 'universal' RNA phylogenies contains nothing new and PCR has made the accompanying protocols for direct sequencing of rRNA more trouble than they are worth. At only seven pages the chapter on 'gene versus genome evolution' was intriguing but too short. The remaining reviews cover techniques for studying species variation, DNA–DNA hybridization methodology (in great detail) and satellite DNA.

The detailed taxonomy and population genetics of *Drosophila* are the subject of four out of the six case studies. There is an interesting discussion of the evidence for episodic evolutionary change in *Drosophila* populations subject to periodic extinction on Hawaii. A complementary chapter by Fontdevila deals with colonization and founder events. Speciation is also the subject of a case study on the genetic barriers to gene exchange between sibling species of *Drosophila*. Finally, there is a review of the ultrastructure of sperm, its potential in taxonomy and possible role in speciation. The best taxonomy case study was a polyphasic investigation of the relationships and population structure of cave crickets using morphology, DNA–DNA pairing and allozyme data. A take-home message being that some morphological features are more reliable for inferring taxonomic relationships than others. The final case study is a fairly straightforward description of the use of DNA probes for the identification of *Onchocerca* parasites.

The last section of the book is a list of experimental protocols designed to complement the overview material. Most of the procedures are fairly standard but it is probably useful to have them collected together. The protocols for the isolation of mitochondrial and chloroplast DNA, DNA–DNA hybridization and PCR of mitochondrial genes are particularly detailed.

From the title of this book I expected a balanced treatise addressing questions at all taxonomic levels from the kingdom to the species. The main focus of the book, however, is firmly on the metazoa and deals mainly with relationships at the species and subspecies level, with strong elements of population genetics. Prokaryotes and unicellular eukaryotes are given short shrift. Viruses, and the opportunities for studying taxonomy and evolution that they represent, are not even mentioned. An additional problem with the book is the lack of a chapter on how to analyse the molecular data. Given the fact that many taxonomists view programmes such as PAUP and PHYLIP as black boxes, this is an important omission. At £86.00 the book is very expensive and there are cheaper books which contain more information of general interest to taxonomists, for example *Molecular Systematics*, by Hillis and Moritz, and *Nucleic Acid Techniques in Bacterial Systematics*, by Stackebrandt and Goodfellow.

MARTIN EMBLEY
Department of Zoology
The Natural History Museum
London, U.K.

DNA Replication, 2nd edition. Arthur Kornberg and Tania A. Baker, W. H. Freeman and Co., New York. 1992. Pp. 931, hardback. Price £49.95. ISBN 0-7167-2003-5.

Those who have learnt to love replication proteins through Arthur Kornberg's books will avidly read this up-dated version of his classic text on DNA replication. In collaboration with Tania Baker, he has produced a monograph of encyclopaedic dimension with references to more than 5,000 authors and a subject index covering 122 page columns. The style established in his previous books is conserved. The early chapters are dedicated to DNA structure, precursors and inhibitors, and the enzymes dear to the heart of any biochemist interested in DNA transactions. Here are the biochemical details of a wealth of DNA and RNA polymerases, primases, ligases, DNA-binding proteins, helicases, topoisomerases and deoxyribonucleases. These chapters, paying homage to the enzymes, form the heart of the book; they are authoritative and outstandingly comprehensive in their treatment of diverse bacterial and eukaryotic enzymes.

Later chapters integrate the properties of the enzymes into the replication cycles and life styles that they support. Reappearance of the protein players in different acts provides that web of perspectives which makes this book so intriguing. However, it requires time to make the necessary connection: this book is not designed for the quick fix! The new edition contains major expansions on genome origins of replication, plasmids and organelles, and the regulation of chromosomal replication and cell division. The chapters relating closely to the biochemistry of replication proteins are particularly successful. Sections on bacterial and animal viruses, which have provided so many windows on replication processes, are a mine of information. The account of the *Escherichia coli* chromosomal replication origin (*oriC*) and replication directed from it with purified proteins is masterful, with a balance between experimental approaches and factual details. However, the complementary chapter on the control of initiation from *oriC* within the cell cycle provides the orthodox view at the time of its writing with little comment of the shortcomings of models based on the accumulation of DnaA protein. The penultimate chapter — addressing repair,