Numerous other papers are of great, even absorbing, interest and I can only refer to a few. Ginther *et al.* (pages 211–219, a paper with a very long title) examine mitochondrial DNA sequence variation and allele frequencies of several nuclear genes in Mapuche Indians from Patagonia and compare their genetic profile with other Amerinds and with worldwide populations, as part of the attempt to obtain data on the genetic characteristics of genetically unique populations which are in danger of disappearing. The next paper, by Roewer *et al.*, studies the Yanomami Indians of the Amazon lowland, who stayed in relative isolation until recent times and who have received anthropological field study.

The third main section of the book, which I have not yet touched on, discusses applications of DNA fingerprinting to plants (one paper), to micro-organisms, parasites and invertebrates (six papers), to fishes and birds (five papers) and to mammals (eight papers). These contain many interesting studies which deserve the reader's attention, but I will only mention one: Ruth & Fain's article on 'The "individualization" of large North American mammals' (pages 429–436), which discusses the application of DNA profiling to wildlife crime. Animal species in the world pet trade include at least 140 mammal species, 85 bird species and 57 reptile and amphibian species. The global market for illegal wildlife products has escalated into an estimated $1–2 billion a year. Fish and wildlife estimates are $200 million per year in the US alone, where it is estimated that two animals are poached for every animal taken legally. DNA fingerprinting has been applied to more than 150 forensic cases in North America, including such species as elk, deer, wolf, parrots, bighorn sheep, eagle and bear. It has also been used in more than 150 suspected fraud cases of horse paternity.

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Preconception and Preimplantation Diagnosis of Human Genetic Disease. Edited by R. G. EDWARDS. Cambridge University Press. 1993. 340 pages. Price £60/US $99.95 hardback. ISBN 0 521 40425 8.

When the prospects for preimplantation diagnosis were first reviewed eight years ago by McLaren (1985) the outlook was pessimistic. Almost immediately afterwards, however, there was a surge of interest and research on preimplantation diagnosis began in earnest. The beginnings of the subject may be traced further back and include the early attempts to separate X- and Y-bearing spermatozoa, to control the sex of the conceptus, and the sexing of preimplantation rabbit embryos from biopsied cells (Gardner & Edwards, 1968). Nevertheless, it was not until the late 1980s, when human *in vitro* fertilization had become securely established as a viable clinical technique, that research focused on the possibility of diagnosing genetic diseases in the human preimplantation embryo. Current research in preimplantation diagnosis stems from the previous achievements in reproductive biology, embryology and genetics. The mammalian embryologists, who had experience of handling preimplantation embryos, were the first to get involved and they shaped much of the early research.

The initial phase of research in preimplantation diagnosis involved feasibility studies. Mouse and human preimplantation embryos were used to compare different biopsy procedures, to evaluate different genetic tests etc. Sensitive biochemical assays were tested early in this phase but these have largely been abandoned in favour of DNA-based tests. *In situ* hybridization was tried first but this was superseded by PCR (polymerase chain reaction). PCR remains the method of choice for most studies but *in situ* hybridization seems to be making something of a come-back as FISH (fluorescence *in situ* hybridization). Undoubtedly there have been some indifferent experiments but, nonetheless, real progress has been made during this 'feasibility phase'. The next phase (clinical trials) began in 1990 at the Hammersmith Hospital (Handyside *et al.* 1990) but, as yet, few other centres have followed suit. Preimplantation diagnosis is a demanding business and it is not yet clear whether it will develop into a routine clinical service. We may now be at a watershed between the feasibility studies and clinical application. Some appropriate biopsy and analytical techniques have been identified but further refinements are needed before they can be used routinely.

So much for the history, now what of the book? Professor Edwards has earned a unique place in the field, through his pioneering work on *in vitro* fertilization. His enthusiasm for the further development of preimplantation diagnosis shows through in this volume: as well as editing the book he co-authored 4 of the 14 chapters. Despite the title, much of the book is devoted to providing background information about prenatal diagnosis in general. I found these review chapters useful but this information is readily available elsewhere. I suspect that this emphasis may disappoint those who have developed an interest in preimplantation diagnosis from a background of prenatal diagnosis rather than embryology or reproductive biology.

I must confess that I found the organization of the book a bit disconcerting. The 14 chapters are grouped into 5 sections entitled respectively 'Background' (chs. 1–3), 'Development of prenatal diagnosis' (chs. 4–6), 'Methods of DNA diagnosis' (chs. 7 & 8), 'Preconception and preimplantation diagnosis' (chs 9–13) and 'Ethics and Law' (ch. 14). These sections

seem logical enough but chapters dealing specifically with preconception and preimplantation diagnosis appear in both the first and fourth sections.

Chapter 1 ('History of and opportunities for preimplantation diagnosis') is particularly wide-ranging and reviews the early attempts at sex selection as well as many of the major achievements during the last eight years of research in preimplantation diagnosis. The possibility that cryopreservation may provide an alternative to the current practice of rapid diagnosis and transfer in the same menstrual cycle is mentioned here but not elaborated upon in subsequent chapters. Chapter 2 provides a good review of the biology and metabolism of preimplantation human embryos and chapter 3 considers the scope of preimplantation diagnosis. Our appetite for preimplantation diagnosis is whetted by chapters 1 and 3 but we do not encounter it again until much later in the book (chaps. 9–13). In the meantime, five chapters (4–8) provide useful background information on human genetic diseases, prenatal diagnosis and DNA technology.

The reader anxious to learn about the current research in the field would probably head straight for the section entitled 'Preconception and preimplantation diagnosis'. Even here, we are given a bit more background. The first chapter in this section deals with the possibility of sexing spermatozoa, in order to avoid the conception of males at risk for sex-linked diseases, a topic which was introduced in the first chapter of the book. In chapter 10 ('Preconception diagnosis of polar bodies'), we finally arrive at the nub of the matter but this chapter is disappointingly brief (6 pages) and avoids any discussion of the controversial idea that the presence of a *chromosomal* abnormality in the oocyte might be inferred from polar body analysis. The next two chapters ('Cleavage stage biopsy of human embryos and diagnosis of X chromosome-linked recessive disease' and 'Micromanipulations of blastocysts for the diagnosis of genetic disease') deal well with current technology and the final chapter of this section considers whether non-invasive or semi-invasive methods are ever likely to be useful. The last chapter of the book, dealing with ethnics and law, relates to the law in Britain and, in keeping with the more general prenatal diagnosis theme of the book, encompasses abortion as well as assisted conception.

Overall, the book is well presented and I only spotted a few typographical errors (a transposed column heading in Table 9.1 and a few mistakes in the references). In summary, most of the chapters review their topics well and together they provide a useful resource. However, as a whole, the book seems somewhat at odds with its specialized title. In an attempt to be comprehensive, we are given a lot of background on prenatal diagnosis but perhaps not enough about preconception and preimplantation diagnosis itself. Nevertheless the book can be recommended to those who can afford £60 and is most likely to be useful to researchers and advanced students who lack a thorough background in mainstream prenatal diagnosis.

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Molecular Genetics for the Clinician. By D. J. H. Brock. Cambridge University Press. 1993. 289 pages. Price hardback £35.00. ISBN 0 521 41179 3. Price paperback £15.95. ISBN 0 87969 377 0.

Molecular genetics is now a well established part of the undergraduate syllabus. However, for many doctors who qualified before 1980 or even 1985 the 'grasp' of even a glimmer of molecular biology appears to be unobtainable. The specialist books appear too detailed and contain a vocabulary which is altogether unfamiliar. I have not seen a book on the market that makes this topic approachable that is, until now. Dr Brock's book is the best introduction to molecular genetics that I have read. It lays out the whole subject in a form that is easily understandable, and yet, not condescending to a clinician. The book is easy to read, nicely set out with clear diagrams and tables. It takes us through genetic diseases and the terminology, the patterns of Mendelian inheritance and onto the structure and function of genes. Basic techniques which are now common language in most scientific papers, are nicely set out and easily understandable. The book gradually introduces us to more complicated molecular genetics and discusses inherited cancers and oncogenes and on to molecular cytogenetics and genomic imprinting. Towards the end of the book Dr Brock discusses current and future developments and how genetic diseases can be avoided with pre-natal screening. Sadly, there is a paragraph on page 196 which makes nonsense† as well as one or two typographical errors. However, these did not spoil my enjoyment of the book.

† I understand that this occurred after the final proof had been returned to the Publishers (Editor).

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