established after the deadline for contributions to this volume), suggesting that it, and not the sex-determining gene *SRY*, may be an element of an ancient sex determining mechanism found throughout vertebrate species. Might this conservation extend beyond vertebrates to species utilising non-genotypic sex determining mechanisms? Coriat and Sharpe discuss species exhibiting temperature-dependent sex determination (TSD), and are alert to the potential role of *SOX* genes here, perhaps acting via a temperature-sensitive change in protein conformation. Thus, the scene is set for a genetic dissection of not only the mammalian sex determination pathway but also related pathways, perhaps radiating from well-conserved elements common to each. This collection describes many of the complicated issues in the genetics of (primarily mammalian) sex determination which form the frontier of the subject, and is highly recommended to undergraduates and researchers in allied fields.

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Evolutionary Biology Vol. 29. Max K. Hecht, Ross J. MacIntyre and Michael T. Clegg (eds). Plenum Press, New York. 1996. Pp. 321. Price £63.60 ($79.50 in USA). ISBN 0 306 45230 8.

This is the latest addition to a series that aims to provide topical discussions that span a broad range within evolutionary biology. Despite the title it is the thirtieth volume in the series (apparently an unnumbered supplement accounts for the discrepancy). Should you read it? Yes — these are stimulating contributions from active researchers. Should you buy it? That depends: the book covers so many areas that only certain parts will appeal to any one reader and I suspect that the price will deter many would-be purchasers. Perhaps sales would be helped by a snappier title. Why not imitate the music industry's successful approach to compilations of 'hit singles' and try 'Now that's what I call evolutionary biology Volume 29'?

My personal favourite is the chapter by T. A. Markow on the evolution of *Drosophila* mating systems. She summarizes a wealth of information and demonstrates that it can be misleading to extrapolate from the 'standard' species (*D. melanogaster*). She emphasizes that interspecific variation in male reproductive characters is more extensive than in females and discusses the recent discovery in several *Drosophila* species of gigantic sperm in terms of the varying investment by different species in the ejaculates of their males.

Two other articles on very different topics display an unusual combination of clarity and interest. P. A. Parsons' discussion of stress and evolutionary change emphasizes his view that in the real world energy constraints will set limits to adaptation. The chapter is a useful distillation of his recent papers which deal with specific cases of this general argument. K. E. Holsinger is concerned with the factors that affect the evolution of plant mating systems. Most analyses have assigned a dominant role to inbreeding depression but here Holsinger makes a strong case for the importance of pollination biology (for example, the pattern of pollen transfer).

A pair of articles deal with evolution at the molecular level. Sequence comparisons are exploited by M. E. Baker who concentrates on the alcohol dehydrogenase (ADH) locus in a fascinating discussion of the possible physiological role of ADH other than that of the oxidation of ethanol. The comparisons show that ADH belongs to a functionally diverse protein superfamily that includes steroid and prostaglandin dehydrogenases (the unifying property of the substrates for the group is that they are secondary alcohols). The organization of eukaryotic genes is examined by G. Maroni via a comparison of the sizes of the component parts of genes (exons, introns, leader, and 3′ untranslated regions) in 5 representative species. He asks whether the sizes are distributed at random or are associated in a particular pattern. Lots of facts are provided but the general importance of the observed patterns is not addressed. The author seems uncertain and concedes that the problem is whether the samples of species and genes that are included in his analysis turn out to be typical ones.

For me, the least interesting contribution is an excessively long-winded one by H. T. Band which describes the author's work over the last few years on sympatry within the genus *Chymomyza* (Drosophilidae) and concludes that the data do not support Paterson's specific mate recognition concept of speciation. However, the text was laden with so much jargon that I found it difficult to follow the logic.

The concluding chapters deal with aspects of evolutionary developmental biology. The problem of the fin to limb transformation is discussed by E. Vorobyeva and R. Hinchcliffe. They draw together new data from a variety of disciplines (morphological, palaeontological and molecular) to consider the developmental basis of the character transition. They suggest that the argument about mechanism may be resolved by analysis of the expression patterns of homeotic genes. My problem with most recent attempts to explain evolutionary transformation in developmental terms is that they are opposed to neo-Darwinian explanations involving selection and adaptation. In a related field, B. K. Hall argues that there are very few basic types of animal body plan. His chapter is strong on the historical development of the concept of the *Bauplan* but weak on the merits of this approach. I'm unconvinced by the notion that natural selection works upon a restricted set of options provided by the 'laws of form'. The suggestion is that the basic developmental processes are not themselves the product of selection. To me this is unnecessary. The diversity achieved in nature by phenotypic evolution is readily explained by the neo-Dar-

winist as the result of the accumulation of adaptively-favoured variants of individually small effect. Now *that's* what I call evolutionary biology.

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Human Geuome Evolution. M. Jackson, T. Stachan and G. Dover (eds). BIOS Scientific Publishers Ltd, Oxford. 1996. Pp. 320. Price £60.00, hardback. ISBN 1 859960 95 2.

I remember Peter Goodfellow introducing a lecture on sex-determination by saying that as molecular biologists get older they began to think more and more about evolution. Rather as if, having spent your early years working out what a system was, you then reflect on how it got to be like that. The 'Why are we here?' reflection of middle age angst perhaps. You can see this motive coming out to various degrees in the twelve contributions to this book — *Human Genome Evolution*. To some this means describing the human genome, or rather their own particular patch, in sometimes excruciating detail with a few token words about evolution thrown in for good measure. To others, most notably the Marks Stoneking and Jobling, the accent was on human evolution and what variation in the uniparental systems of mitochondria and the Y-chromsome had to say about it.

In the first essay David Cooper peers at tea leaves emanating from his human mutation database to advance the, entirely plausible, hypothesis that the distribution of mutational events seen in the vast numbers of pathological mutations discovered over the last decade or so mirror those to be found in genome evolution in general. There follows, on the other hand, a nice explanation of exon-shuffling by L. Patthy who explains the importance of this device, virtually unknown in molecular pathology, in the diversification of extracellular proteins — in particular those in the matrix and blood-clotting cascades — allowing them to carry a vast range of different binding domains.

Since half the fun in evolution is the licence to float daring speculation in the certain knowledge that you will never be proved wrong, I like the suggestion that the Metazoan radiation in the Cambrian, when the fossil record shows a spectacular increase in the number of multicellular organisms, was only possible because exon-shuffling had allowed the construction of new proteins as communication networks between cells. Also in the daring category is the suggestion in John Hancock's essay on microsatellite evolution and cryptic simplicity (*sic*) that the instability of triplet repeats and their associated disorders (Huntington's, myotonic dystrophy etc.) is causally connected to the rapid increase in brain complexity in recent human evolution; to paraphrase the words of the author, 'slipped strand mispairing made us what we are today'. I hadn't thought of it quite like that before. Other chapters — sadly none of which were written by the book's editors — delve into the intricacies of HLA (*de rigueur* I know but aaaargh!), mini- and microsatellites, *Alu* repeats and sex chromosome evolution.

Altogether a fine and comprehensive book whether to use as a source — and most chapters are extravagantly referenced — or to find out what is going on in human genome evolution. Most chapters are well written and some are models of clarity, for instance Nicola Royle's on telomeres, but in others the danger signals in the prose like 'towards a greater understanding of' or 'gain fresh insights into' were sure signs that you were going to have to work jolly hard to do so.

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Books received

Search for the Tourette Syndrome and Human Behavior Genes. David E. Comings. Hope Press, Duarte, CA. 1996. Pp. 309. Price $29.95, paperback. ISBN 1 878267 41 8.

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Nucleic Acids in Chemistry aud Biology (2nd edn). G. Michael Blackburn and Michael J. Gait. Oxford University Press, Oxford. 1996. Pp. 544. Price £29.94, paperback. ISBN 0 19 963533 1.

Evolution of Social Insect Colonies: Sex Allocation and Kiu Selection. Ross H. Crozier and Pekka Pamilo. Oxford University Press, Oxford. 1996. Pp. 306. Price £19.95, paperback. ISBN 0 19 854942 3.