

## Books received

**Understanding DNA and Gene Cloning: a Guide for the Curious. 2nd edition.** Karl Drlica. John Wiley, Chichester. Pp. 240. Paperback, price £17.95. ISBN 0 471 62225 7.

**Nucleic Acids and Molecular Biology.** F. Eckstein and D. M. J. Lilley (eds). Springer-Verlag, Berlin. 1992. Pp. 251. Hardback, price £70.00. ISBN 3 540 53121 1.

**The Ant and the Peacock.** Helena Cronin. Cambridge University Press, Cambridge. 1992. Pp. 490. Hardback, price £27.50. ISBN 0 521 32937 X.

**Biotechnological Innovations in Animal Productivity. Biotol (Biotechnology by Open Learning).** Butterworth-Heinemann, Oxford. 1991. Pp. 217. Paperback, price £19.95. ISBN 0 7506 1511 7.

**Rice Biotechnology.** G. S. Khush and G. H. Toenniessen (eds). C.A.B International, Wallingford. 1991. Pp. 300. Hardback, price £45.00. ISBN 0 85198 712 5.

**Advanced Methods in Plant Breeding and Biotechnology.** D. R. Murray (ed.). C.A.B International, Wallingford. 1991. Pp. 370. Hardback, price £49.95. ISBN 0 85198 706 0.

**Gene Regulation: Biology of Antisense RNA and DNA (Raven Press Series on Molecular and Cellular Biology, Volume 1).** R. P. Erickson and J. G. Izant (eds). Raven Press, New York. 1991. Pp. 384. Hardback, price £52.00. ISBN 0 88167 854 6.

**Protocols in Human Molecular Genetics. (Methods in Molecular Biology, Volume 9).** C. G. Mathew (ed.). John Wiley, Chichester. 1991. Pp. 461. Hardback, price £60.00. ISBN 0 89603 205 1.

## Book reviews

**Cytogenetics of Amphibians and Reptiles.** Ettore Olmo (ed.). Birkhauser Verlag, Basel. 1990. Pp. 270. Price £30.00, Hardback, ISBN 0 8176 2358 2.

**Amphibian Cytogenetics and Evolution.** D. M. Green and S. K. Sessions. (eds). Academic Press, New York. 1991. Pp. 456. Price £60.00, Hardback, ISBN 0 12 297880 3.

Both of the above titles are based on symposia held in 1989 and both are concerned with taxonomic relationships and karyotype evolution. Olmo rapidly collected the proceedings from a session of the First World Congress of Herpetology. The speed of production and variable layout indicate that the editor sensibly demanded camera-ready copy from the participants and dispensed with any notion of proof-reading. The result is quite legible and intelligible, but photographic evidence has to be taken on trust. Green and Sessions selected some contributions from a meeting of the American Society of Ichthyologists and Herpetologists, invited other articles and used typesetting with much better photographs.

Herpetology is a convenient but archaic term, recalling a period when any salamander could be casually lumped into the genus *Lacerta*. Modern taxonomists all seem to be splitters, leading to the complaint that their creation of new species counterbalances our destruction of existing ones. Karyotypes are not an infallible guide to relationships, as any passing muntjac will confirm, but they do have certain

advantages over other characters. Relative stability seems to be one. Chromosome number or the location of a nucleolar organizer may be so trivial that they can be treated as selectively neutral markers, yet some chromosome rearrangements do reduce heterozygote fitness and could thus create a barrier leading to speciation. The basic tenets of karyotype evolution were elaborated more than 40 years ago, with later techniques mainly adding more precise means of identifying chromosome regions or DNA sequences.

Olmo's book contains five reviews of amphibian karyotypes and four reptilean ones, with almost as many brief reports in each category that might well have originated as posters. Most of the reviews here carry the authority of long experience, so this collection's usefulness will greatly outlast that of normal symposium volumes.

Morescalchi provides an introductory survey of general amphibian karyotypes, concluding that a reduction in chromosome number occurred in all three orders despite later increases in some tropical anurans. He attempts to relate genome size to environmental conditions and life history, but adds that this allows a 'dichotomic interpretation of cytogenetic reports'. I suspect that is equally true for reptiles. Schmid is surely *the* expert on amphibian C-banding with 400 species to his credit. He explains here why they are refractory to G-banding and outlines the basis for more specific banding procedures. Macgregor traces a possible evolution of one very peculiar chromosome and several satellite DNA sequences in European newts. Following

amplification at a centromere, the satellite is subject to dispersal along the chromosome and to loss of identity by sequence divergence — a race described with infectious enthusiasm. Mancino considers hybridization among the same newts as the best criterion of specific status and of karyotypic evolution. Kohno summarizes C-banding comparisons among Asiatic salamanders, related to *Hynobius* by their primitive karyotype. Brief reports make similar comparisons among Pelobatid toads, and *Rana* species from Spain, Greece and China (where they are known as stink frogs).

King traces the origins of Australian reptiles on the basis of karyotypic and immunological comparisons. He concludes gekkos and skinks were original residents of Gondwanaland, but other extant reptiles are more recent interlopers from Asia. Moritz examines the evolution of sex chromosomes in gekkos: some of which possess a temperature-dependent sex system of determination, genetic systems have appeared repeatedly in other species (XY or WZ with polymorphism) and one species shows both systems. At least one amphibian is also known to combine WZ sex chromosomes with similar temperature dependence. Olmo considers the impact of modern techniques on the relatively conservative karyotype of Lacertid lizards. His thoughtful assessment is fortified by two short reports on the same group which relate a satellite DNA to centromeric heterochromatin and trace changes in nucleolar organizer position. Becak reviews the sex chromosomes of snakes and reports on a polymorphism in *Bothrops* associated with intersexuality. There are additional reports on the karyotypes of colubrid snakes from Japan and of rattlesnakes on Mexican islands.

All that adds up to as wide a coverage as one could reasonably expect. There is something of interest for anyone who is not allergic to chromosomes, and it is much more enjoyable to trace the topical literature this way than to scan *Current Contents*. Only the most dedicated herpetologists and cytogeneticists are likely to require their own copies, I fear, but other biologists would find parts of this volume stimulating and all university libraries should be persuaded to acquire it.

Green and Sessions book contains 15 substantial articles, ranging from general reviews of all living amphibians, all anurans or the little that is known of caecilian karyotypes, to treatments of more restricted groupings of salamanders or the better known genera *Xenopus*, *Hyla* and *Triturus*. Other articles deal with topics which cross these systematic boundaries. This results in considerable repetition. Several articles seem dutiful rather than inspired. The best ones, however, both convey information and excite curiosity. Nardi compares karyotypes and some DNA sequences of *Hydromantes*, a salamander resident in Sardinia and the neighbouring mainland: its nearest relatives live in California. Mancino demonstrates how monoclonal antibodies can highlight particular loops of lampbrush chromosomes but the function of proteins they identify remains a mystery. Schmid surveys amphibian sex chromosomes including the OW/OO system of a New Zealand frog discovered by Green, who also considers it at greater length as a supernumerary chromo-

some. King provides an admirably critical discussion of how heterochromatin may have evolved in different lineages.

Several of the authors also contributed to Olmo's book, but usually consider different topics in this one. Despite some inevitable duplication, then, the two volumes generally complement each other. Both deserve a place in a reference collection.

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**Human Chromosomes: A Manual of Basic Techniques.** R. S. Verma and A. Babu, Pergamon Press, New York. 1989. Pp. 240. Price £31.95, Hardback, ISBN 0 08 035774 1. £15.95, Paperback, ISBN 0 08 036839 5.

It is commonly acknowledged that the best way to learn a new technique is to work in a laboratory where it is performed routinely. Alternatively an expert in the technique may be invited to work in your laboratory. Failing these possibilities you are left to consult papers in which the technique in question is described in full or to equip yourself with a good textbook.

The authors of this book state that their aim is to give a comprehensive account of all the basic techniques used in research on human chromosomes and in more detail than many journals would see fit to publish. The expansion of clinical cytogenetics in the last 20 years, however, makes this admirable intention something of a tall order and all to be accomplished in the space of 240 pages!

The book is primarily written as a laboratory manual for technicians and students of human cytogenetics but is also intended to serve as a reference book for postgraduates and others interested in this subject. In addition many of the techniques described apply to other, particularly mammalian, species.

A wide range of topics currently used in cytogenetic screening or in the process of being developed for clinical use, is covered. One chapter is devoted to the culture of various tissues such as skin and bone marrow as well as the most common source of human chromosomes, peripheral blood. Prenatal diagnosis using amniotic fluid or chorionic villus sampling is given a section. Banding techniques, still the mainstay of routine cytogenetic analysis, rate a chapter as does *in-situ* hybridization using gene probes and blotting techniques, Northern and Southern. Specialized techniques concerned with high resolution banding, sister chromatid exchange, fragile X and sex chromatin are also covered.

A section on meiotic tissue gives methods for obtaining pachytene, metaphase I and II chromosomes from testicular biopsies and a brief discussion on making preparations of these stages from ovarian material. A part of this section deals with the examination of synaptonemal complexes by both microspreading and three-dimensional reconstruction