

Book reviews

Frogs, Flies, and Dandelions, Speciation — The evolution of new species. Menno Schilthuizen. Oxford University Press, New York. 2001. Pp. 245. Price £17.95, hardback. ISBN 0-19-850393-8.

The book gives a personal account of the species debate. Unfortunately, the species concept itself, throughout all biology, is confusing as it can mean different things to different people. In taxonomy, the species is either a real group of similar organisms (i.e. *Homo sapiens*) or the most basic abstract category upon which a classification hierarchy is built to order the overwhelming multitude of life forms into manageable natural groups. In a related field, evolutionary biology, the species concept serves for the study of adaptation, and to explain the origin of biological diversity, most of which is partitioned between species. Out of a dozen proposed concepts, none have been satisfactory to all evolutionary biologists who usually think of extant species either in terms of phenotypically distinct groups of individuals, or of separate reproductive units. The rise of a new species is in practice reduced to the evolution of phenotypic divergence, or to the evolution of a reproductive barrier. The circumstances in which this may happen, and the forces behind the various processes leading to the multiplication of species, are considered collectively under the topic speciation?

Studies on speciation have made a big leap forward in the last few decades. Perhaps the most revolutionary advance has been the incorporation of sexual selection, and the experimental demonstration of a female choice, a powerful force unrelated to the physical environment, for shaping secondary sexual traits and the behaviour of the opposite sex. Molecular markers have provided measures of species divergence time and allowed estimates of gene flow between populations. Computer simulations have been used to follow genetic change under a wide range of parameter values. Natural selection has retained its central role in promoting rapid phenotypic divergence by evolution of complex adaptations to alternative environments. As natural selection can maintain differences, in spite of gene exchange between populations, the role in speciation of isolation, brought about by absolute physical or reproductive barriers, has been de-emphasized. This change has in turn removed obstacles to the acceptance of a role for sympatric speciation.

In ten chapters, Menno Schilthuizen covers the controversial issues, and reports on new developments in speciation studies in vivid language, playing with puns and telling anecdotes from the lives of scientists. In a book aimed at a wide audience little biological knowledge is assumed. Technical terms are kept to a minimum; others, like genome or genitalia, are explained in the glossary. Inquisitive students can nevertheless consult original works, as a rich bibliography is given in the notes and reference list. I read the book with

pleasure. I found the chapter 'Seductive Theories' the most stimulating; this deals with the consequences of sexual reproduction extending from courtship, through mating to gamete interactions within the female reproductive tract. This surely is a new developing field with many surprises ahead. What would the metaphysical poet John Donne have made of it had he known the profusion of plates, hairs, combs, spikes, bulbs and spiraled wires on the male genitalia of the chicken flea? Don't miss this book.

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Are We Hardwired? The Role of Genes in Human Behaviour. W. R. Clark and M. Grunstein. Oxford University Press, New York. 2000. Pp. 322. Price £16.99, hardcover. ISBN 0-19-513826-0.

For an immunologist and a biological chemist to write a book about human behavior and its presumed genetic underpinning for a lay audience is surely tempting fate, for this is nothing, if not a minefield of controversy. When the jacket commendations come from three of the world's most committed behavior geneticists, it is enough to make critics of the field such as this reviewer approach very warily. The early chapters do little to allay suspicion. The dubious heritability statistic is presented as if universally accepted as meaningful, braced by one of those human interest sagas of twins reared apart who on meeting 40 years later discover they have called their pet dogs by the same name and smoke the same brand of cigarettes. Proteins are described as 'made from information stored in the DNA in the form of genes' (p27). It seems we are set for a bumpy ride.

The authors' intentions are, however, more complex. They approach humans via an evolutionary route, beginning with the sensitivities shown by even single-celled organisms. *Caenorhabditis elegans*, a nematode whose genetics, neuroanatomical wiring, development and behaviour must have had more research hours devoted to it than almost any species, perhaps excluding *Drosophila*, warrants a chapter, as does *Aplysia* for learning and memory. We then get to the 'real stuff': human aggression, addiction, intelligence and sexual orientation, themes which have so absorbed more than a century of behaviour genetic research.

Through most of the text, Clark and Grunstein are scrupulous in their attempt to avoid 'gene for' discourse, but they find this balance hard to maintain whenever they move