

(L. Partridge & G. A. Parker); Population differentiation without speciation (A. E. Magurran); From genes to individuals: developmental genes and the generation of the phenotype (D. Tautz & K. Schmid); Revealing the factors that promote speciation (T. G. Barraclough, A. P. Vogler & P. H. Harvey); Gulliver's further travels: the necessity and difficulty of a hierarchical theory of selection (S. J. Gould); Geographic range size and speciation (K. J. Gaston & S. L. Chown); Rates of speciation in the fossil record (J. J. Sepkoski, Jr.); and The evolution of diversity in ancient ecosystems: a review (S. Conway Morris).

From the series of chapter titles, it already becomes clear that a whole range of speciation related issues is covered: intraspecific variation, population genetics, developmental genetics, several types of selection, reproductive isolation, speciation per se in its various aspects, species selection, environmental influences, geographical conditions, ecological aspects, the role of (mass) extinctions . . . , etc., etc. All attempting to clarify a piece of the puzzle of the actual evolutionary mechanisms behind as well as the triggering conditions of the advancement of diversity in the living world. A fine overview of current research in the field, specifically including some intriguing novel insights into the decidedly not too self-evident connection between variation and the emergence of new species. Also, some quite refreshing views on the respective influences of geographic area and ecosystem on the origins of diversity provide, even 150 years after Darwin, still new ways of probing into the very kitchen of Evolution. For the specialist in the field: a must.

J. C. VON VAUPEL KLEIN

T. A. MOUSSEAU & C. W. FOX (eds.), 1998. *Maternal effects as adaptations*: i-xiv, 1-375, ill. (Oxford University Press, Oxford). ISBN 0-19-511163-X. Hardcover. Price £ 49.50 (approx. US\$ 80.00).

Maternal effects constitute a form of transgenerational phenotypic plasticity: for instance, in a butterfly, the mother's choice of a hostplant for oviposition determines the micro-environment in which the larva will develop, and this may well influence (a) its phenotype and (b) its own choice, once adult, for laying eggs in its turn. Phenotypic variation, therefore, instead of being solely the result of the interaction of (the expression of) genotype and environmental conditions, is dependent on other factors as well, including these maternal effects. Since the variation in phenotype makes up the substrate on which Darwinian natural selection may act, these results of maternal behaviour influence evolution and are worth being studied by evolutionary biology. In the present book, specifically those effects are examined that supposedly comprise adaptations. In other words, the mechanisms mothers employ to enhance their offspring's fitness. As such, effects like these can be approached through methods of quantitative genetics and play a role in assessing the paths of micro-evolution in discrete cases.

This text, skilfully edited by Mousseau and Fox, encompasses a comprehensive overview of various approaches to the issue, arranged in four parts and 19 articles. Part I ("Conceptual issues") includes five chapters: The evolutionary genetics of maternal effects (by M. J. Wade); The influence of direct and indirect genetic effects on the evolution of behavior: social and sexual selection meet maternal effects (A. J. Moore, J. B. Wolf & E. D. Brodie III); Inertial growth: population dynamics based on maternal effects (L. R. Ginzburg); What is an adaptive environmentally induced parental effect? (E. P. Lacey); and, Oviposition decisions as maternal effects: conundrums and opportunities for conservation biologists (B. D. Roitberg). Part II ("Assessment and measurement"; three chapters) contains: The detection and measurement of maternal effects (D. A. Roff); Genetics of maternal and paternal effects (R. G. Shaw & D. L. Byers); and, The role of environmental variation in parental

effects expression (M. C. Rossiter). "Reviews of maternal effects expression" is the title of Part III, with seven contributions: Maternal environmental effects in plants: adaptive plasticity? (K. Donohue & J. Schmitt); Maternal effects as adaptations for transgenerational phenotypic plasticity in insects (C. W. Fox & T. A. Mousseau); Are maternal effects in fish adaptive or merely physiological side effects? (D. D. Heath & D. M. Blouw); Maternal and paternal effects in birds: effects on offspring fitness (T. Price); Maternal influences on larval competition in insects (F. J. Messina); Maternal effects, developmental plasticity, and life history evolution: an amphibian model (R. H. Kaplan); and, Perinatal influences on the reproductive behavior of adult rodents (M. M. Clark & B. G. Galef, Jr.). Part IV provides some "Case studies of maternal effects", in four papers: Maternal control of fly diapause (D. L. Denlinger); Adaptation of maternal effects in the wild: path analysis of natural variation and experimental tests of causation (B. Sinervo); Maternal effects and the maintenance of environmental sex determination (W. M. Roosenburg & P. Niewiarowski); and, Density-mediated maternal effects on seed size in wild radish: genetic variation and its evolutionary implications (S. J. Mazer & L. M. Wolfe).

Following the body of the book, the editors summarize the contents in "Concluding remarks: generalizations, implications, and future directions". The volume is concluded by three indices, i.e., taxonomic, author, and subject. Interesting reading for those who are involved in evolutionary biology, including speciation, and who want to get an up-to-date picture of the indeed complex issue of parental effects on the expression of phenotypic plasticity, hence on the whole of the substrate on which fitness can act in evoking natural selection.

J. C. VON VAUPEL KLEIN

S. HEALY (ed.), 1998. *Spatial representation in animals: i-x, 1-188, ill.* (Oxford University Press, Oxford). ISBN 0-19-850006-8 (paperback) or ISBN 0-19-850007-6 (hardback). Price £ 22.50 (paperback; approx. US\$ 37.00).

The ways in which animals (including Man under natural conditions) find their way around in their environment has never failed to raise our interest. At scales varying from a trip through a single tree up to a journey across a whole continent, what are their cues: visual, olfactory, magnetic . . . what are the landmarks they choose and how do they choose these? What precisely are the roles of learning, of memory, of innate skills, and in which form(s) is spatial information stored in the brain? Obviously, answers to questions like these require an approach that integrates results from ethology, ecology, psychology, and neurophysiology based studies. The present book thus brings together cross-disciplinary research on navigation in a variety of species, and such in an accessible and truly exciting way. Originally intended to awaken the interest of students for the study of animal navigation, Healy's compilation presents an overview of the latest developments in the field.

The contents include eight separate contributions: Mechanisms of landmark use in mammals and birds (K. Cheng & M. L. Spetch); Places and landmarks: an arthropod perspective (T. S. Collett & J. Zeil); Role of dead reckoning in navigation (A. Etienne, J. Berlie, J. Georgakopoulos & R. Maurer); Spatial representations and homing pigeon navigation (V. P. Bingman); Spatial memory, landmark use and orientation in fish (V. A. Braithwaite); Spatiotemporal aspects of avian long-distance migration (P. Berthold); Landmark use and the cognitive map in the rat (E. Save, B. Poucet & C. Thinus-Blanc); and Neural mechanisms of spatial representation (D. Sherry & S. Healy). The volume concludes with 25 pp. of references and a useful index.

Though still quite heavily skewed in the direction of the vertebrates, also research in, e.g., arthropods has progressed over the last decades, reason why also carcinologists can benefit from