For those who want a more detailed look at individual pesticides there is probably no better source than the *Handbook of Pesticide Toxicology*, an updated version of Hayes's splendid *Pesticides Studied in Man* (Williams and Wilkins, 1982). Like its predecessor, the new handbook discusses general principles of pesticide toxicology before reviewing the evidence for the effects of the chemicals on humans, domestic animals and wildlife. It is intended as a complete guide to the field, with chapters written by acknowledged experts. Each chapter is well researched and information about particular properties of individual pesticides is easy to find. The handbook is a real treat for those who can afford it.

The wider impact of pesticides is addressed in *Fate of Pesticides and Chemicals in the Environment*, a legacy of a 1972 accord between President Richard Nixon of the United States and Leonid Brezhnev, general secretary of the Soviet Communist Party. It is the product of an international symposium held under the auspices of the US Environmental Protection Agency and involving scientists from the United States and the former Soviet Union. According to the book's editor, the fate of pesticides and chemicals formed an important bilateral agreement between the two countries.

Fate of Pesticides and Chemicals in the Environment is a very specialized book that discusses various models of the movement of chemicals in air, soil and water. Some chapters deal with processes that may affect retention in the environment, such as oxidation–reduction reactions of pollutants in the bottom sediments of lakes. Others deal with microbial transformation of chemicals in aquatic systems. The end result is a tome that is likely to appeal to a select group of environmental scientists. In common with most other books on pesticides, this one also peers into the future. It should come as no surprise that many of its predictions about the way ahead are not unlike those that the BMA is recommending. In their conclusion to the book, Julius Menn and Lawrence Christy of the US Department of Agriculture express their belief that the "agrochemical industry will continue to introduce safer, more efficacious and selective synthetic chemicals". They believe that many of these will be eventually replaced by natural-product pesticides and plants resistant to insects and disease. I hope that we will not have long to wait. □

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Ups and downs — aerial crop spraying accounts for no more than two per cent of all pesticide applications, but is a main focus of public concern.

Realm of the senses

Wolfgang Marwan and Dieter Oesterhelt

Sensory Receptors and Signal Transduction. *Edited by John L. Spudich and Birgit H. Satir. Wiley: 1992. Pp. 269. £79, $118.*

IT has been known for more than a hundred years that cells, including unicellular organisms, can sense their environment and respond to it in a remarkable variety of ways. The molecular mechanisms underlying this basic phenomenon of signal transduction are now beginning to be unravelled. Chemical compounds, light or other physical stimuli are sensed by receptor proteins, which, in the process, undergo a conformational change. The conformational signal triggers a cascade of events that ultimately alter cell behaviour. In many systems, the sensory machinery is highly dynamic: the sensory input may be amplified by catalytic cascades; the information from several types of receptors may be integrated; and feedback loops may mediate adaptation to the stimulus, allowing the detection of temporal changes in receptor excitation.

The main focus of this volume is the biochemical processes involved in photo- and chemosensing in cells of organisms ranging from bacteria to mammals. The five articles cover a vast range of phenomena, including archaebacterial phototaxis, phytochrome-regulated plant development, neutrophil leukocyte chemotaxis and vertebrate olfaction. The book is appealing because it provides a more or less systematic overview of cellular sensing, combined with a more detailed discussion of some well-understood model systems.

The systematic tour through the various types of photoreceptors requires comparative discussions of systems such as vertebrate vision, which is well understood, and blue-light-modulated gene expression in plants, which is not. This makes the book gripping to read, and immediately highlights the gaps in our knowledge. The same is true for the coverage of chemoreception. The chapter on bacterial chemotaxis gives a detailed review of the enormous knowledge that has accumulated over the past 20 years. This section is by far the most extensive in the book, in keeping with the current status of the enterobacterial chemotaxis system as the best-understood signal-transduction network.

The book is clearly written and easily understandable throughout. It provides a valuable point of access to original literature, with references up to 1991 for some chapters. The volume will be useful to all researchers working on signal transduction or in photobiology. Graduate students interested in the subject, which is barely covered by standard textbooks on biochemistry or biology, will also profit from reading it. And, as a fine example of the state of the art, it will be sure to inspire newcomers to the field of sensory reception and signal transduction. □

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