

understood. They go on to point out that the family contains some of the most "benign" plants, such as potatoes, tomatoes, and peppers, as well as some of the most "sinister," such as mandrake, henbane, and tobacco. The family thus is clearly of more than ordinary interest. While this volume makes a substantial contribution toward an overview of the family, it is far from being as comprehensive as its title suggests and it is uneven in breadth and level of coverage.

The first section of the volume considers the taxonomy and floristics of the Solanaceae. It presents a synoptic classification of the family that recognizes three subfamilies, whereas in the chapter concerned with the South American members of the family that immediately follows only two subfamilies are recognized. These chapters are followed by accounts of Solanaceae that occur in India, Nigeria, and Australia, though it is not clear why these regions are singled out over others. The account of New World ethnobotany is limited to solanaceous hallucinogens; that of the Old World omits uses of the family as food. Seven chapters are concerned with alkaloids and four with various other classes of chemical compounds. Most of these deal with specific chemical compounds or with individual genera or species; again, an overview of the family is lacking. Two sections are concerned with anatomy and morphology, though the component chapters are concerned mostly with taxa below the familial level. Twelve of the 19 chapters devoted to "biosystematics" of genera and sections are concerned with *Solanum* alone.

Some papers in this volume present reviews of their topics, but the majority are original research publications which, in many instances, utilize members of the Solanaceae only incidentally as research objects. Many of these papers will be of little interest to biologists who are entranced by the Solanaceae per se. On the other hand, many of the papers concerned with such topics as floral biology, speciation, incompatibility, and numerical taxonomy will be of interest to those with little affection for nightshades and their kin. These latter papers deserve wider attention than they may receive having been published in a volume whose title does not convey the diversity of the papers included in it.

Clearly, one cannot fault editors for not producing a volume that they did not intend to produce. The audience of this publication, however, would have been broadened considerably if each section had included a prefatory review placing the component chapters in perspective

or an extensive introduction providing the bridges between the "eclectic mixture of unrelated facts" that the editors have tried to avoid with questionable success.

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## Binocularity

**Stereoscopic Vision.** Papers from a meeting, London, March 1978. The Royal Society, London, 1979. Pp. 377-518, illus. Paper, £6.10. Proceedings of the Royal Society of London, vol. 204, No. 1157.

The two eyes have slightly different views of the world. From a comparison of those views, the visual nervous system extracts information about the three-dimensional location of objects. The Royal Society in 1838 published Wheatstone's first formal demonstration of this visual capacity, and it is fitting that 141 years later it should give us a fascinating, if incomplete, progress report, in the form of ten papers from a meeting.

The topics range widely over the physiology, psychology, and development of binocular visual function. The papers vary from theoretical syntheses to summary reviews to research reports. They deal with experiments and data from cats, monkeys, people, sheep, and owls. The methodologies are those of electrophysiology, psychophysics, and neurology. It is not surprising that no great impression of unity emerges.

Nonetheless, there is much of interest here. Perhaps the most impressive recent contribution to our understanding of binocular vision has been the discovery and analysis, in the visual areas of the cerebral cortex, of single nerve cells that are sensitive to variations in retinal disparity, the difference between the positions of features in the two retinal images of a three-dimensional scene. The properties and development of these neurons are the concern of many of the papers. B. Fischer and G. F. Poggio provide a review of their elegant studies of the binocular properties of neurons in the cortex of awake behaving monkeys, and S. M. Zeki and D. Regan and his colleagues present some of the accumulating evidence that the brain contains specialized cells used for the analysis not simply of depth but of motion in depth. Two of the pioneers in this physiological arena, P. O. Bishop and C. Blakemore, give more theoretical reviews of the neuronal

connectivity and developmental plasticity of binocular interaction. Bishop proposes subtle local disorder in the otherwise highly organized structure of connections in the cortex as the basis for neural depth processing, and Blakemore considers the likely role of the early visual environment in establishing the precise parameters of that disorder. Another pioneer, J. D. Pettigrew, in the outstanding paper in the book, supplies a detailed description of binocular processing in the brain of the owl. In this species there exist neural mechanisms that are apparently identical to those seen in mammals, yet the two evolutionary lines diverged long before these mechanisms evolved.

The rest of the collection seems a little spotty, probably for lack of a contribution by Bela Julesz (the major figure in recent advances in the psychology of stereopsis) and for lack of significant representation of modern theoretical treatments. And the various contributions certainly lack unity of style. But after all this is not the final story, only a progress report. As such, it contains much that merits the close attention of anyone with two eyes and an interest in why.

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## Books Received

**Advanced Quantum Theory and Its Applications through Feynman Diagrams.** Michael D. Scadron. Springer-Verlag, New York, 1979. xiv, 386 pp. \$39.80. Texts and Monographs in Physics.

**Advances in Microbial Physiology.** Vol. 18. A. H. Rose and J. Gareth Morris, Eds. Academic Press, New York, 1979. x, 312 pp., illus. \$38.50.

**Annual Review of Materials Science.** Vol. 9. Robert A. Huggins, Richard H. Bube, and David A. Vermilyea, Eds. Annual Reviews, Palo Alto, Calif., 1979. x, 500 pp., illus. \$17.

**Annual Review of Sociology.** Vol. 5. Alex Inkeles, James Coleman, and Ralph H. Turner, Eds. Annual Reviews, Palo Alto, Calif., 1979. x, 416 pp. \$17.

**Arctic and Tropical Arboviruses.** Proceedings of a symposium, Mont Gabriel, Canada, May 1977. Edouard Kurstak, Ed. Academic Press, New York, 1979. xiv, 328 pp., illus. \$19.50.

**Assessment of Technical Decision.** Case Studies. Ernest Braun. David Collingridge, and Kate Hinton. Butterworths, Boston, 1979. 60 pp. Paper, \$2.95. Science in a Social Context.

**Astroblemes.** Crytoexplosion Structures. G. J. H. McCall, Ed. Dowden, Hutchinson and Ross, Stroudsburg, Pa., 1979 (distributor, Academic Press, New York). xviii, 440 pp., illus. \$39.50. Benchmark Papers in Geology, vol. 50.