area 1, which contains one of the multiple representations of the hand in the postcentral gyrus of some primates, may convey an evolutionary advantage for texture discrimination capacities to monkeys that have this extra representation. Darian-Smith and colleagues show that only neurons in somatosensory cortex fire differently when a monkey actively palpates textured surfaces of different spatial gratings. They also show that the discharge patterns are confounded by the speed of finger movements over the surfaces. They suggest that some unknown mechanisms or cortical regions provide for subtraction of the patterns of finger movements to allow identification of the responses that are unique to the surfaces. Alternatively, as Iwamura and colleagues suggest, neurons responsive to particular features of an object, such as edges or degrees of hardness, may abstract the basis for more complex discriminations. Nelson shows, however, that the interactions between sensory inputs and movements are complex, since the patterns of neuronal response to a vibrotactile stimulus in different parts of somatosensory cortex vary considerably in relation to the phases and context of active movements of the stimulated hand. What effect might the premovement inhibitions of sensory induced discharges studied by Nelson have on the responses noted by Darian-Smith *et al.*? Only minimally considered though they are central to the understanding of texture discrimination capacities are the intensive (Lederman), modal, and temporal features that specify textured surfaces.

Motor control of the hand is generally considered similar to that for any movements of the body but may differ considerably for fine movements, such as precision grips. In a review of earlier work by Phillips and others, Evarts emphasizes that, like motor control of the speech apparatus, fine hand movements are characterized by a high degree of fractionation and individuation of the muscles of the hand. Proprioceptive inputs from these muscles contribute to a transcortical reflex through motor cortex that is particularly active in modulating motor cortex discharges that are used in accurate positioning and precise fine movements. The purpose of this feedback is to stabilize limb position, according to Evarts. Papers by Muir and Cheney *et al.* show by means of the methods of spike-triggered averaging that these motor cortex neurons are active in phase with and probably encode simple parameters of active movements of the intrinsic hand muscles during precision grips; the outflow from a single motor cortex neuron fractionates to multiple muscles as postulated previously. During fine movements there is evidence that these motor cortex discharges are linked to particular muscles.

Several papers consider the question of which cortical areas are important for directing movements. Georgopoulos *et al.* show that neurons in areas 4 and 5 are concerned with the direction of a movement and not the trajectory or targeting of the movement. Trajectory and targeting may be served by neurons in the supplementary motor cortex, where cells show a "modality-specific preparatory process for sensory-triggered motor responses" (Tanji), or by cells in area 7, where responses are stimulus-related but contingent upon the performance of movements (Lamarre *et al.*). These results still do not indicate how the particular trajectory of a movement is coded by the discharges. Is it by synchronously controlling groups of muscles, by setting joint angles, or by learning some topographical relationship of the hand in space? Answering this question and locating where in the cortex this process occurs might be pivotal to understanding fine movement controls and the subtractive processes that may be needed to extract sensory signals received during active touch.

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Some Other Books of Interest

Embryology of Angiosperms. B. M. JOHRI, Ed. Springer-Verlag, New York, 1984. xxvi, 830 pp., illus. $115.

This work, characterized by its editor as an advanced treatise, consists of 16 chapters by a total of 19 authors. The opening chapter, by Johri and Ambegaokar, traces the study of angiosperm embryology from 1694 to the current era. There follow chapters on the microsporangium (Bhandari), the ovule (Bouman), the female gametophyte (Willemse and van Went), the pollen grain (Knox), fertilization (van Went and Willemse), the endosperm (Vijayaraghavan and Prabhakar), the embryo (Natesh and Rau), polyembryony (Lakshmanan and Ambegaokar), and gametophytic apomixis (Nogler). The role of polyploidy is dealt with by D'Amato and the structure and the germination of the seed are dealt with by Boesewinkel and Bouman and by Jacobsen. The remaining chapters discuss embryology as related to taxonomy (Herr), homologies and phylogeny (Favre-Duchartre), and experimental embryology (Johri and Rao). The book has both taxonomic and subject indexes.—KL

The Experimental Biology of Bryophytes. A. F. DYER and J. G. DUCKETT, Eds. Academic Press, Orlando, Fla., 1984. xviii, 281 pp., illus. $68.50. Experimental Botany, vol. 19.

Noting that none of the several books about bryophytes published in the last few years has been "directed primarily towards the broadly-based experimental approach," the editors of this volume have set out to provide such a treatment. A brief introduction by Richards is followed by accounts of structure and ecological adaptation (Proctor), breeding systems (Wyatt and Anderson), cytogenetics (Newton), culture (Lal), cell and plastid cycles (Paolillo), and development (Knoop). The remaining chapters deal with hormonal regulation of gametophytic development (Cove and Ashton), photomorphogenesis (Hartmann and Jenkins), uptake of mineral elements including pollutants (Brown), and photosynthesis and its products (Valanne). The editors note the lack of a chapter on ultrastructure. A subject index concludes the book.—KL

Books Received

Alcoholism in the Professions. LeClair Bissell and Paul W. Haberman. Oxford University Press, New York, 1984. xvi, 214 pp. $24.95.

All the World's a Fair. Visions of Empire at American International Expositions, 1876–1916. Robert W. Rydell. University of Chicago Press, Chicago, 1985. x, 328 pp., illus. $27.50.

Alternating Copolymers. J. M. G. Cowie, Ed. Plenum, New York, 1985. xii, 281 pp., illus. $47.50. Specialty Polymers.

Anaerobic Treatment of Forest Industry Wastewaters. P. Rantala and A. Luonsi, Eds. Pergamon, New York, 1985. x, 326 pp., illus., + appendix. Paper, $44. Water Science and Technology, vol. 17, No. 1. From a symposium, Tampere, Finland, June 1984.

Analysis in Classes of Discontinuous Functions and Equations of Mathematical Physics. A. E. Vol'pert and S. I. Hudjaev. Nijhoff, Dordrecht, 1985 (U.S. distributor, Kluwer, Hingham, Mass.). xviii, 678 pp. $117.50. Mechanics: Analysis, 8.

Lift Is Where You Find It. Joe Stein. Zig Zag Papers, Zig Zag, Ore., 1985. xiv, 207 pp., illus. Paper, $7.95.

The Literature of the Life Sciences. Reading, Writing, Research. David A. Kronick, assisted by Wendell D. Winters. ISI Press, Philadelphia, 1985. xiv, 219 pp. $29.95. The Library and Information Science Series.

Lithium. Current Applications in Science, Medicine, and Technology. Ricardo O. Bach. Wiley-Interscience, New York, 1985. xx, 422 pp., illus. $80.

Living Coral Reefs of the World. Dietrich H. H. Kühlmann. Arco, New York, 1985. 185 pp., illus. $24.95. Translated from the German edition.

Low Dose Oral and Transdermal Therapy of Hypertension. M. A. Weber, J. I. M. Drayer, and R.

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