Strategy for Vision Studies

Eye Movements and Vision. ALFRED L. YARBUS. Translated from the Russian edition (Moscow, 1965) by Basil Haigh. Lorrin A. Riggs, Translation Ed. Plenum, New York, 1967. xiv + 222 pp., illus. $17.50.

One of the most interesting chapters in the problem of coding and transmission of sensory information started with the observation that, in vertebrates at least, the messages from the eye to the brain are, in effect, a-c coupled; that is, impulses in the optic nerve fibers occur essentially only at the onset and offset of illumination. This is, however, not reflected in our visual perceptions, which do not seem to contain this kind of time-dependent characteristic. The reconciliation of these conflicting findings has traditionally been sought in the continuously occurring small eye movements which serve to sweep the optical images across receptors and thus permit the on and off retinal units to "do their thing." Early experiments with optically stabilized retinal images (by means of mirrors fitted on contact lenses) did indeed reveal a fading of contours after a few seconds' absence of movement of images across the retina, but a puzzling fact remained: the images spontaneously reappeared.

Yarbus's significant contribution is the development of tightly fitting contact lenses that do not move at all with respect to the eye. As a result, he achieves stabilization good enough and lasting long enough that there is no reappearance of even very bright lights for several minutes. With this technique, given in detail in the first section of the book, Yarbus has now gone on to investigate a variety of stimulus conditions. In what is surely the most important segment of this book, Yarbus describes the appearance of stabilized visual fields of various colors to which are added fields of different colors, stabilized and unstabilized. Some of the results immediately fit in with reasonable expectations on the basis of present knowledge of physiology of retinal function. Others clearly do not, but point to higher cortical operations; they thus constitute exceedingly valuable leads for future research in color perception.

The last half of the book relates to the author's work on eye movements. It covers ground familiar to Western readers, although most of the studies were done in the author's laboratory. The approach, an indigenous mix of psychology and cybernetics, is interesting and obviously productive, but it is not by any means superior to the research strategies with which we are more conversant. The translation does not read smoothly and contains some errors (there is a confusion between the words *subthreshold* and *suprathreshold* on pp. 74–75). However, the results on the appearance of colored stabilized and unstabilized retinal images are essential reading for all workers in the field, and the detailed description of the experimental techniques will be invaluable to those moved by Yarbus's exciting findings to extend his work.

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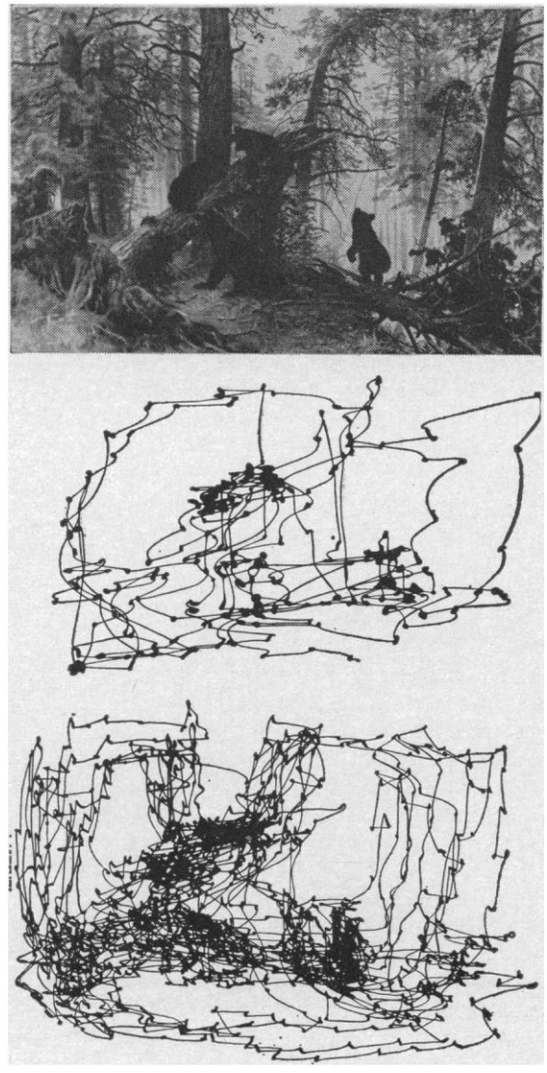

Some results of a study by A. L. Yarbus of eye movements during perception of complex objects. The lower two panels are records of the eye movements made during a 2-minute and a 30-minute free examination, with both eyes, of the picture in the top panel, I. I. Shishkin's "Morning in the Forest." These and similar recordings showed that neither the most detailed elements (here, the grass and leaves) nor the brightest elements of a picture necessarily attract the most attention. In studies in which both black-and-white and colored reproductions of the same painting were examined, color had no appreciable effect on the distribution of fixation points. [From *Eye Movements and Vision*]

A Somewhat Alien Botany

On Integration in Plants. RUDOLF DOSTÁL. Translated from the Czech edition (Prague, 1959) by Jana Moravkova Kiely. KENNETH V. THIMANN, Ed. Harvard University Press, Cambridge, Mass., 1967. xxiv + 218 pp., illus. $5.95.

Rudolf Dostál is a distinguished Czechoslovakian plant physiologist whose work, although not widely known in the Western world, has been influential in certain restricted fields. For example, my own Ph.D. thesis, completed 25 years ago, was based in part on the observation by Dostál and Hosek that potentially reproductive shoots in *Circaea* reverted to the vegetative state under the influence of exogenous auxin. In 1959 Dostál wrote a monograph entitled *O Celistvosti Rostliny*, published by the State Agricultural Publishing House in Prague. The book under review is a translation of that work which has been carefully edited, somewhat updated, and critically annotated by Kenneth Thimann. We owe deep thanks