

seek specific characters in their search for prey, and that once a new constellation of characters is discovered to mean "food," it is selectively sought. This has been an attractive concept, although L. Tinbergen advanced it merely as a hypothesis to explain his data relating prey abundance to risk of predation. A test, even on a non-insectivorous species such as crows, is welcome. Croze provides reasonable support for the usefulness of the concept.

Regrettably, Croze's admirable contribution suffers much from a lack of skill in the use of the English language and the publisher's failure to provide better copy editors. In any event, Croze's empirical approach to searching images merits the attention of ethologist, psychologist, and ecologist alike.

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Ethological Essays

Social Behaviour in Birds and Mammals. Essays on the Social Ethology of Animals and Man. JOHN HURRELL CROOK, Ed. Academic Press, New York, 1970. xlii, 492 pp., illus. \$21.

One can feel sympathy with the editor of this book, which is dedicated to the memory of K. R. L. Hall, in his attempt to unite over a common denominator individual papers which one would expect to find in a behavioral journal or in a volume called University of Bristol's Miscellaneous Collection, Sec. Psychology. In this book, comprehensive and creative reviews (for example J. H. Crook's own chapter on the socioecology of primates) alternate with rather specialized accounts (for example J. D. Gross-Custard's chapter on feeding dispersion in some overwintering wading birds). In the introduction the hope is expressed "that these studies demonstrate the value of carrying out behavior research at several levels of analysis within the same institution and attempting purposefully to show how they may be synthetically related," but it remains unclear on what this hope is based.

Four of the 11 chapters seem to fulfill the expectations evoked by the title of the volume and therefore deserve mention. Crook reviews and discusses the sociology of primates, with emphasis on the contribution of en-

vironmental factors and of tradition, and gives special attention to the social mobility of the male in primate groups. A good example of his approach is his discussion of cercopithecoid social systems and their association with environmental variables: Assuming three major habitat types of increasing seasonal change (forest, savanna, arid open country), he proposes associations with predation, numerical density, size and composition of the reproductive groups, male motility, utilization of space (home range, territory), group coherence, communication types, and reproductive seasonality. J. E. Archer gives a comprehensive review of the effects of population density on the behavior of various species of rodents. His conceptual framework is as follows: High densities lead to emigration; if emigration is restricted, aggression increases as an effect of crowding, which in turn leads to physiological changes (such as adrenal hyperactivity) and behavioral changes (such as shortened or interrupted sequence of sexual or maternal behavior). I. Vine has compiled an extensive review of communication by facial-visual signals, devoting much space to observations and investigations on human subjects, especially to the role of gazing. Janet Kear's chapter on the adaptive radiation of parental care in waterfowl gives a detailed survey of pair-bond, nest construction, incubation, and family life in swans, geese, ducks, and related waterfowl including flamingos, screamers, and magpie geese, and sets new standards for comparative behavior studies.

This book apparently does not provide revolutionary changes in our concepts of social behavior, but has its merit as a guide to the widely scattered literature. The attitude of its editor and contributors follows the present trend in ethology: emphasis of ecological aspects, caution in the application of traditional concepts of drive and motivation, interest in the role of learning, and great hopes in systems theory and cybernetics (without much attempt to test their value).

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Books Received

The AAAS Science Book List. A Selected and Annotated List of Science and Mathematics Books for Secondary School Students, College Undergraduates and Nonspecialists. Compiled by Hilary J.

Deason. American Association for the Advancement of Science, Washington, D.C., ed. 3, 1970. xiv, 440 pp. \$10; cash orders, \$9.

Adipose Tissue. Regulation and Metabolic Functions. Bernard Jeanrenaud and Dieter Hepp, Eds. Thieme, Stuttgart; Academic Press, New York, 1970 (U.S. distributor, Intercontinental Medical Book Corporation, New York). viii, 212 pp., illus. \$11.50.

Advances in Astronomy and Astrophysics. Vol. 7. Zdeněk Kopal, Ed. Academic Press, New York, 1970. xiv, 294 pp., illus. \$18.50.

Advances in Child Development and Behavior. Vol. 5. Hayne W. Reese and Lewis P. Lipsitt, Eds. Academic Press, New York, 1970. xiv, 266 pp., illus. \$13.

Advances in Clinical Chemistry. Vol. 13. Oscar Bodansky and C. P. Stewart, Eds. Academic Press, New York, 1970. xiv, 536 pp., illus. \$22.50.

Advances in Food Research. Vol. 18. C. O. Chichester, E. M. Mrak, and G. F. Stewart, Eds. Academic Press, New York, 1970. x, 322 pp., illus. \$16.

Advances in Heterocyclic Chemistry. Vol. 12. A. R. Katritzky and A. J. Boulton, Eds. Academic Press, New York, 1970. x, 340 pp., illus. \$18.

Advances in Veterinary Science and Comparative Medicine. Vol. 14. C. A. Brandly and Charles E. Cornelius, Eds. Academic Press, New York, 1970. xviii, 420 pp., illus. \$22.

Adventures in Research. A History of Ames Research Center, 1940-1965. Edwin P. Hartman. Scientific and Technical Information Division, National Aeronautics and Space Administration, Washington, D.C., 1970 (available from the Superintendent of Documents, Washington, D.C.). xx, 556 pp., illus. \$4.75.

Aide-mémoire de détermination bactérienne. R. G. Capet. Vigot, Paris, 1970. 136 pp. Paper, \$7.

Alejandro de Humboldt. Modelo en la Lucha por el Progreso y la Liberación de la Humanidad. Memorial en Conmemoración del Bicentenario de su Nacimiento. Akademie-Verlag, Berlin, 1969. xviii, 186 pp. + plates.

Amine Oxidases and Methods for Their Study. R. Kapeller-Adler. Wiley-Interscience, New York, 1970. xiv, 320 pp. \$19.50.

Analytical Methods Used in Sugar Refining. R. W. Plews, Ed. Elsevier, New York, 1970. viii, 234 pp., illus. \$15.

Annual Review of Genetics. Vol. 4. Herschel L. Roman, Laurence M. Sandler, and Allan Campbell, Eds. Annual Reviews, Palo Alto, Calif., 1970. xiv, 524 pp., illus. \$10.

Annual Survey of Photochemistry. Vol. 2, Survey of 1968 Literature. Wiley-Interscience, New York, 1970. xvi, 412 pp., illus. \$19.95.

Approximation Theory. Proceedings of a symposium, Lancaster, England, July 1969. A. Talbot, Ed. Academic Press, New York, 1970. viii, 356 pp., illus. \$11.

Aquatic Chemistry. An Introduction Emphasizing Chemical Equilibria in Natural Waters. Werner Stumm and James J. Morgan. Wiley-Interscience, New York, 1970. xvi, 584 pp., illus. \$24.95.

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