Book Reviews

Interactive Behaviors

Altruism and Aggression. Biological and Social Origins. CAROLYN ZAHN-WAXLER, E. MARK CUMMINGS, and RONALD IANNOTTI, Eds. Cambridge University Press, New York, 1986. xiv, 337 pp., illus. $39.50. Cambridge Studies in Social and Emotional Development. Based on a conference, Bethesda, MD, April 1982.

This book explores connections between altruistic and aggressive behaviors from the perspective of developmental psychology. Research on aggression first flourished among developmental psychologists during the 1950s and 1960s, when psychoanalytic and behavioristic approaches were prevalent. Consequently, both the endogenous, biologically based processes discussed by psychoanalytic theorists and concepts such as modeling and reinforcement are emphasized in much of this research. In contrast, the psychological study of altruism and other prosocial behaviors increased dramatically in the 1970s and was shaped in part by the cognitive-developmental and social-cognitive stage theorists who were influential at that time. Thus, as the editors of this volume state in their introduction, the topics of altruism and aggression "have ridden the crests of different Zeitgeists" (p. 6).

Perhaps this is why the study of aggression and the study of altruism have been relatively separate scientific endeavors, and why the theoretical frameworks for the two domains have differed considerably. However, exciting changes and new syntheses are occurring within both areas of study and are what this volume is about.

Altruism and Aggression is, to my knowledge, one of only two scholarly volumes in which the explicit goal has been to integrate and compare perspectives concerning the development of aggression and prosocial behavior (the other being *The Development of Antisocial and Prosocial Behaviors*, edited by Olweus, Block, and Radke-Yarrow [Academic Press, 1986]). By focusing on both topics, the contributors to this book highlight similarities and differences in the theoretical and methodological approaches to the two domains of study, propose conceptual links and overlaps, and illustrate new approaches emerging in the study of aggression and altruism.

For example, the contributors discuss a variety of ways in which biological factors might influence the development and expression of prosocial as well as aggressive behaviors. Until recently, the role of biology in altruism was virtually ignored by all except sociobiologists. However, sociobiologists have had relatively little impact on developmental or social psychologists' thinking, perhaps because they originally did not focus on individual or cultural differences in altruism. Nonetheless, recent empirical findings from twin studies (for example, Rushton *et al.*, *J. Pers. Soc. Psychol.* **50**, 1192 [1986]) are consistent with the view that biological factors account for a considerable amount of the variance in prosocial behavior, aggression, and empathic responding.

One particularly intriguing, albeit speculative, example of the possible role of psychobiological mechanisms in altruistic as well as aggressive behavior is provided by Panksepp. He suggests that mechanisms underlying helping and aggressive behaviors are related and that both types of behavior could be critically linked to opioid activity in the brain. He cites literature suggesting that brain opioids promote social comfort, bonding, and play and may evoke feelings of trust and peacefulness, whereas opioid withdrawal is associated with distress, irritability, and aggressiveness. The possibility of the resonance of neural circuits between bonded individuals, resulting in helping behavior, also is considered. If Panksepp is correct, his and others' work on opioids has profound implications for understanding both similarities and differences in individuals' social functioning.

Another particularly interesting issue discussed by several contributors (especially Cummings and his colleagues) is the emergence of altruistic and aggressive tendencies in the first years of life. The early manifestation of altruistic behavior observed by researchers in recent years is inconsistent with previous assertions by cognitive-developmental theorists that young children are incapable of understanding others' feelings, and suggests that humans have a biologically based predisposition to attend to and respond to others' emotional states (as well as to aggress). What is especially surprising is that individual differences in style of responding to others' distress (for example, responding with intense emotion, cold avoidance of the distressed other, or combative defense of others) are evident by the age of one to two years and are relatively stable into the early school years. This finding suggests that temperamental factors (perhaps biologically based) mediate a considerable amount of prosocial and aggressive responding in the early years. It is also quite possible that these findings reflect significant and enduring (or continuing) effects of environmental factors on social interaction.

In fact, environmental factors seem to influence prosocial and aggressive responding in important ways. For example, Cummings and his colleagues found a positive correlation between supportive, empathic maternal behavior and one- to two-year-olds' prosocial and reparative behaviors. Moreover, among school-aged children, training in perspective taking and empathic responding promotes altruistic behaviors (Feshbach and Feshbach). It appears that sympathetic responding and socio-cognitive skills may play an important role in the development of prosocial and aggressive behavior (Dodge) and that socialization experiences affect these domains of functioning. Indeed, it is likely that emotional responses such as empathy and sympathetic concern, which reflect cognitive as well as emotional capabilities, can provide a focal point for the integration of biological, socio-cognitive, and social psychological approaches to the investigation of altruism and aggression.

Other topics raised by the editors and contributors include definitional issues (which affect the operationalization of constructs as well as perspectives on basic theoretical issues), the complex relations between altruism and aggression, and the developmental course of altruistic and aggressive behavior. In addition, the contributors delineate deficits in the existing literature and avenues for future work. Although it is clear from their discussions that much remains to be learned about the development of prosocial and aggressive tendencies, the contributors provide the reader with diverse and provocative perspectives and an overview of extant research. Indeed, this volume is likely to be of considerable interest both to researchers working in relevant areas and to scientists and students from other disciplines who wish to acquire an overview of current research on the development of prosocial and antisocial behaviors.

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Chinese Botany

Science and Civilisation in China. Vol. 6, Biology and Biological Technology. Part 1, Botany. JOSEPH NEEDHAM with the collaboration of Lu Gwei-Djen and Huang Hsing-Tsung. Cambridge University Press, New York, 1986. xxxii, 718 pp., illus. $95.

The aim of the stupendous series to which this volume belongs is to document the early and continuous development of scientific discovery in China up to the arrival of the Baconian revolution from the West in the early 19th century; to provide narrative

access to a vast historical literature hitherto little known to Western historians of science; and to convince us that the Scientific Tradition is not the perquisite of the West.

Needham is among the last of the polymaths. Witty, confident, and masterful, entertaining, idiosyncratic, but above all broadly informed, he majestically guides us through a great metropolis of knowledge, from the Greek and Roman classics to the medical tracts of Moorish Spain, to Vedic sources, and through the early discoveries of late Medieval Europe. We are borne along by his enthusiasm for the subject and by his affection for the Chinese and their civilization.

The present volume is the first part of the section of the series dealing with botany. (The section is to be completed later by Georges Métaillé.) The volume starts with a summary exposition of the vegetation, climate, and soils of China, which is followed by a section that recounts the ancient development of floristic and ecological plant geography in China and another that extols Chinese botanical terminology and nomenclature. The main theme is then embarked upon, which is a commentary on the Chinese historical botanical references and monographs from their origins in and before the fourth pre-Christian century. The account of how the Chinese grasped, and described in a manner that can still be appreciated, the relationship between soils and the landscape on a local as well as regional basis helps explain how they evolved intensive yet sustainable forms of land-use that have survived for more than 2000 years. Needham's accounts of monographs on useful and ornamental plants, including citrus fruits, bamboos, and chrysanthemums, and the last section, in which he reviews the very early Chinese knowledge of natural pesticides and biological control, document the astonishing diversity of uses to which the Chinese have put their flora. During the European Dark Ages agricultural and horticultural techniques were burgeoning in China. Inevitably, nomenclatural defects are frequent in the text, and the author's limited knowledge of the natural history of the plants he mentions shows through at times; but nowhere does this detract from the usefulness of the work or limit it as means of access to Chinese sources.

Needham's work may at present be regarded as arcane, but I am confident that as the eastern nations reestablish their ascendancy in the civilized world, so his gargantuan enterprise will prove fundamental to our understanding of their success. Needham is a worthy successor to Li Shih-Chen, "prince of pharmacists," whose 16th-century Great Pharmacopoeia, described by Needham as "a pandectal treatise on mineralogy, metallurgy, mycology, botany, zoology, physiology and other sciences," is only now surpassed.

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Kimberlite Geology

Kimberlites. Mineralogy, Geochemistry, and Petrology. ROGER H. MITCHELL. Plenum, New York, 1986. xviii, 442 pp., illus. $65.

Before about 1970, the study of kimberlites and their included diamonds and ultramafic xenoliths was pursued by only a few investigators. Interest in these topics has since mushroomed, as has the number of kimberlite-related publications. The nonspecialist now needs a guide to get started in the kimberlite world. Roger Mitchell has undertaken the task of writing such a guide and in this book has provided a comprehensive review of virtually all aspects of kimberlite geology, including morphology, emplacement, mineralogy, mineral and whole rock chemistry, tectonic setting, and petrogenesis. The book deals only with kimberlites and does not cover accidental inclusions, notably mantle nodules and diamonds, as did Barry Dawson's *Kimberlites and Their Xenoliths* (1980). Because Mitchell provides a more thorough and updated treatment of kimberlites, his volume may replace most of the kimberlite section of Dawson's book.

The book is well written and amply illustrated with line drawings in the sections on kimberlite morphology, distribution, occurrence, and tectonic setting. Outcrop photos of kimberlite features would have been a welcome addition, despite the fact that many kimberlite exposures are unimpressive. In the mineralogy and geochemistry portions Mitchell provides many data tables, representing analyses from well-documented, typical, or unusual occurrences. Included in these sections are numerous useful plots of chemical data illustrating the chemical trends or other features described in the text. Unfortunately, some of the photomicrographs of kimberlite textures are of poor quality.

In the preface Mitchell states, "This book is intended to be informative to the neophyte while being of lasting value to the specialist." He accomplishes both of these objectives, for even kimberlite researchers can turn to this book to learn about topics outside their immediate specialty. There are, however, a number of small flaws in the book that will be apparent to those familiar with the details of specific topics. Aside from typographical errors and obvious misstatements, such as referring to the two strike directions of kimberlite dikes in Lesotho as WNW and ESE, there are misinterpretations or misquotations of some works. Given the extensive list of references (34 pages) that Mitchell had to read and assimilate, such errors are understandable and should not matter to most readers.

Mitchell presents his characteristically conservative approach to kimberlite classification, even to the point of suggesting that some of the well-known micaceous kimberlites (for example, Roberts Victor, Bellsbank) might be better classified as a distinct rock type, namely, "orangite." This does not detract substantially from the value of the book but should indicate to the reader that interpretations and viewpoints in other portions of the book may be equally conservative and not generally accepted. In addition, the treatment of conclusions is uneven. Where Mitchell feels strongly about a given topic (for example, the definition of "kimberlite"), the conclusions are strongly stated. Where he is less personally involved (for example, on the tectonic setting of kimberlites), the conclusions are weak or nonexistent.

Generally, though, Mitchell attempts to synthesize the available observations and reconcile conflicting models. For example, after the description of diatreme structures and the opposing fluidization and hydrovolcanic models for their origin, he presents Clement's model incorporating both mechanisms and introduces his own modifications; the result is an explanation that he believes fits most of the available data.

Overall, this is an excellent book. Researchers working in kimberlites should find it a useful reference, and it will serve as a good introduction to the field for those just starting out.

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Planetary Evolution

Atmospheres and Ionospheres of the Outer Planets and Their Satellites. SUSHIL K. ATREYA. Springer-Verlag, New York, 1986. xiv, 224 pp., illus. $69.50. Physics and Chemistry in Space, vol. 15.

This book summarizes current knowledge of the atmospheres and ionospheres of the outer planets. Although the visits of Pioneer