constituencies; and even the character of the first Americans to call themselves psychologists.

The resulting psychology concerned itself with how individuals lived in their worlds and contained the seeds of applicability, soon planted and fertilized by psychologists responding to cultural and institutional pressures that demanded a relevant science. The boom in compulsory education fostered by the progressive ideal and reinforced by the desire to "Americanize" millions of immigrants interested many university administrators and trustees in educational psychology, and psychologists responded quickly. In focusing on the problems of remedial education some researchers defined the field of clinical psychology, and others gradually realized that consulting on advertising and personnel problems could supplement their often meager salaries. These new psychological activities were less immediately applicable than O'Donnell—choosing in most cases to downplay the details of scientific practice—implies. Recent work in the history of technology might shed light on this transition. In any event, by 1900 American psychology had a sharply applied flavor, and to this science concerns for consciousness had little to say. American psychologists thus began focusing on human behaviors long before Watson's manifesto, sometimes explicitly (as other historians have realized), but more often implicitly. Here, O'Donnell argues, lie "The Origins of Behaviorism."

Watson's own 1913 statements well exhibit a Deweyean concern for the practical (though he denied having learned from Dewey) and have their roots in the details of Watson's own career, embedded primarily within the subspecialty of animal psychology. The field—the development of which O'Donnell reviews especially effectively in a chapter entited "Of mice and men"—emerged in the 1890's as a way to investigate functional concerns but had trouble establishing its professional place within psychology around 1905 as many university administrators doubted its practicability. Many animal psychologists (like Edward L. Thorndike and Robert M. Yerkes) thus evolved into educational or clinical psychologists, as they realized that schoolchildren and the hospitalized could be studied almost as easily as other organisms. Watson handled the problem by redefining all psychology in his own terms, making behavioral studies of animal learning seem practical for eduational psychology. Watson's own behaviorism thus simply represented only one brand of behavioral psychology, more self-conscious and radical than others but no more scientifically influential. His reputation among today's psychologists derives more from his own propagandizing for his views as a J. Walter Thompson advertising executive in the 1920's and from half a century of "history and systems" courses than from any scientific achievement. O'Donnell's history takes this campaigning into account and goes far toward destroying the myths that psychologists share about their past. His book thus represents revisionist history of science at its best, illuminating past science in a way that sheds light on current practices.

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Social Psychology

Attribution. Basic Issues and Applications. JOHN H. HARVEY and GIFFORD WEARY, Eds. Academic Press, Orlando, FL, 1985. xiv, 326 pp. $45.

For almost a decade now we have witnessed the publication of a steady procession of social psychological volumes on causal attribution. The appearance of each new volume raises the question whether the volume represents an authentic advance or is an embroidered rehash. As far as the present work is concerned, the former characterization is decidedly more accurate. Whether it attempts to set limits on the attribution paradigm or to expand it by elaborating hitherto neglected dimensions, the volume describes research that is for the most part significant and innovative and at times exciting.

The first six chapters of the book address basic issues. Two papers challenge fundamental tenets of the attribution paradigm and modify the overly rational and self-conscious image of "person" in early attributional writings. Both propound a dualistic thesis whereby the conscious, reflexive mode depicted in attributional analyses is one of two qualitatively dissimilar systems of interacting with the environment. Wilson argues that our behavior is mediated by a largely unconscious system whereas our attempts to verbalize, communicate, and explain mental states (leading to behavior) are mediated by a primarily conscious system. He reports intriguing evidence that the verbal system is often inaccurate in assessing one's own mental states and that it becomes less accurate the more one attempts to increase accuracy. Though Wilson's argument is consistent with his data, his counterintuitive conclusion is unlikely to go unchallenged by future research.

Kassin and Baron focus on the differences between perceptual and cognitive modes of information processing. They argue that the perceptual system is less conscious and effortful than the cognitive system and that it is basically realistic and stimulus-driven whereas the cognitive system is speculative and theory-driven. Kassin and Baron marshal an impressive array of evidence in support of their thesis, drawing on the animal learning, cross-cultural, developmental, and perceptual literatures. They also suggest that current attributional measures could be enriched by the use of nonverbal indices. One hopes that these proposals will inspire research on previously unexplored phenomena.

Other chapters on basic processes propose refinements to existing models of attribution. Hansen proposes that attributional contents be clearly separated from the attributional process and that the latter be related to the social-cognitive models of judgment, memory, and inference. The distinction between content and process also plays a part in a chapter on naive dispositional concepts in which Reeder explicates several tacit assumptions behind dispositional terms having to do with morality and ability and demonstrates that there is more to the contents of causal explanations than early attributional theories may have implied. Reeder argues that contents actually moderate process. For instance, assumptions concerning abilities may moderate the applicability of the discounting principle and, hence, the presence of situational demands does not invariably lead to the discounting of dispositional hypotheses. In order to behave intelligently on demand a person must be intelligent. Does this demonstrate the limits of the discounting principle or merely suggest that the extent of discounting in a particular case varies in accordance with the invariant logic of discounting? I suspect that the latter is the case. At any rate, Reeder's treatment of the issue is imaginative and thought-provoking.

Pittman and D'Agostino present evidence that suggests that motivational effects on attribution need not be distortive or biasing. Thus, increased control motivation may intensify the processing of information, which, in turn, may improve accuracy. This finding contrasts with Wilson's finding that increased processing reduces accuracy in judging one's own mental state. Further research might attempt to disentangle the apparent inconsistency and more clearly specify the moderating conditions of the relation between processing and accuracy.

The motivational theme continues in a chapter by Hill *et al.* that relates concern about having rendered an inaccurate attribu-

tion to liking for a comparison other and in one by Arkin and Baumgardner that discusses the phenomenon of self-handicapping. Unlike defensive attributions, which involve the distorted processing of extant information, self-handicapping consists in the "manufacture" of evidence aimed at avoiding damaging attributions to oneself in the future. Arkin and Baumgardner offer insights into the antecedent conditions, particularly maladaptive ones, of self-handicapping and its consequences.

Arkin and Baumgardner's chapter begins a section on applications of attribution theory. It is followed by a chapter on close relationships in which Fincham criticizes the relative lack of contact between basic attributional notions and the study of close relationships from the point of view of attribution theory. At least in part, the problem could stem from basic attributional models' having been oriented to process whereas attributional studies of close relationships have dwelt on attributional contents and, in so doing, have gone well beyond the global causal dimensions adumbrated in the early models. But beyond problems there is promise: close relationships do seem to involve intense attributional activity occasionally leading to attributional conflicts. Furthermore, formation or dissolution of a relationship may be accompanied by more attributional activity than routine maintenance of the relationship. Fincham's critical review is informative and useful.

The section concludes with a chapter by Anderson and Arnoult that extends Weiner's seminal work on attribution-mediated affect in achievement settings to problems of shyness, loneliness, and depression. Though the (conceptual and empirical) distinctions between these problems are occasionally less than crisp, the linking of attributional styles to affective difficulties is useful, as are the authors' methodological suggestions for ways of measuring spontaneously invoked causes and causal dimensions and of investigating attributional styles as causes of problems in living.

The volume concludes with an elegant analysis by Olson and Ross, who give a historical perspective to the topics covered and highlight the themes of the book. They make the point, a good one, that the attributional paradigm has managed to retain its vitality and distinctiveness and that in the mid-80's it offers an exciting alternative to the information-processing approach of studying social-cognitive phenomena.

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Some Other Books of Interest

Insect Locomotion. MICHAEL GEWECKE and GERNOT WENDLER, Eds. Parey, New York, 1985. viii, 254 pp., illus. Paper, $32. From a congress, Hamburg, Aug. 1984.

This proceedings volume begins with a survey of the field of insect locomotion and ends with a paper on the control of insect locomotory systems by proprioceptive and exterioceptive inputs. The remaining papers are divided into sections on aerial locomotion (14 papers), terrestrial locomotion (ten papers), and aquatic locomotion (two papers). The papers range from a discussion of the role of adipokinetic hormone in maintaining the efficient transport of lipids to the flight muscles in locusts to a description of the effect of amputating a middle or a rear leg on motor activity in cockroach leg muscles. Three papers report the results of film analyses. In one, slow-motion film is used to analyze the flight maneuvers and behavior patterns of dragonflies in their natural surroundings; in another, film of hexapods walking on rough terrain is analyzed to determine the animals' tactics for finding footholds and their strategies for negotiating obstacles; in the third, film of stick insects walking along straight paths and around curves under different equilibrium conditions is analyzed to determine the relation between the observed temporal pattern of leg movements and the equilibrium conditions—L.H.

Bacteria in Their Natural Environments. MADILYN FLETCHER and GEORGE D. FLOODGATE, Eds. Academic Press, Orlando, FL, 1985. x, 197 pp., illus. $45; paper, $24.95. Special Publications of the Society for General Microbiology, vol. 16. From a symposium, Reading, England, Jan. 1984.

The six chapters in this volume deal with microbial adaptations to low-nutrient environments. The volume was prompted by the isolation and study of increasing numbers of very slow growing microbes that are apparently adapted to "starvation" conditions. The book begins with a discussion of the economics of bacterial growth in various nutrient regimes by A. L. Koch. The survival of bacteria under the stress of starvation and the role of storage compounds in survival are discussed by E. A. Dawes, who concludes that survival depends on the interplay of a variety of factors, which may differ in importance depending on the organism. The critical requirement is "the provision of energy to maintain the essential celluar machinery" that will allow growth to take place when a supply of nutrients is restored. The survival of bacteria in soils and in the marine environment is dealt with by S. T. Williams and R. Y. Morita, respectively. P. Morgan and C. S. Dow survey the prosthecate and stalked bacteria ubiquitous to low-nutrient ecosystems and consider the adaptive advantages of these bacteria in such environments as well as the expression of similar adaptive features in bacteria that do not have specialized appendages. The book ends with a discussion of microbes in a nutrient-rich environment by R. H. Dainty that is intended to provide readers with a comparison of the problems encountered by microorganisms in different nutrient conditions.—L.H.

Nucleic Acid Hybridisation. A Practical Approach. B. D. HAMES and S. J. HIGGINS, Eds. IRL Press, McLean, VA, 1985. xvi, 246 pp., illus. $40; paper, $25. The Practical Approach Series.

Though the primary aim of this book is "to provide detailed practical protocols for the major hybridisation procedures," Hames and Higgins note that "rationale and practical advice are interwoven throughout" to facilitate the optimal use of hybridization. The book begins with a short introduction by Southern. It is followed by a discussion of hybridization strategy by Britten and Davidson that is "entirely practical." A considerably more detailed account of the quantitative analysis of solution hybridization and quantitative filter hybridization is contained in two chapters by Young and Anderson. A chapter by Arrand describes the preparation of nucleic acid probes. The use of hybridization in the analysis of recombinant DNA and RNA is described in two chapters by Mason and Williams. Oudet and Schatz discuss electron microscopic visualization of nucleic acid hybrids, and Pardue describes the equipment and procedures used in in situ hybridization. The volume contains four appendixes—on restriction enzymes (Roberts), nucleic acid size markers (Minter, Sealey, and Arrand), computer analysis of nucleic acid hybridization data (Young and Anderson), and suppliers of specialist items—and a subject index.—L.H.

Books Received

Arzneimittel- und Apothekenrecht der Deutschen Demokratischen Republik. Gesetzessammlung mit Kommentar. 13. Lieferung. Joachim Richter *et al.* Akademie-Verlag, Berlin, 1985, 393 pp., unbound. 35 M.

Aspects of Fluvial Sedimentation in the Lower Triassic Buntsandstein of Europe. Detlef Mader, Ed. Springer-Verlag, New York, 1985. viii, 626 pp., illus. Paper, $58. Lecture Notes in Earth Sciences, vol. 4.

Atmospheric Chemistry and Physics of Air Pollution. John H. Seinfeld. Wiley-Interscience, New York, 1986. xxvi, 738 pp., illus. $59.95.

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