

BOOK REVIEWS

Michael Pressley and Charles J. Brainerd (Eds.)
Cognitive Learning and Memory in Children
New York: Springer-Verlag, 1985.
Pp. 250, DM118

Reviewed by Lisa Bird

This book of readings is one of a series on cognitive development edited by Canadian Charles Brainerd. Each of the chapters in this book is of such different flavour that there is little overlap in terms of theoretical outlook, methodology, or even of underlying philosophy. This makes the book quite a compelling smorgasbord of up-to-date information on a variety of topics concerned with cognitive development, particularly within childhood.

The first chapter is an extremely detailed and meticulous literature review of memory strategy research by editor Michael Pressley, and Forrest-Pressly, Elliott-Faust, and Miller. This chapter is one of the few to rely predominantly on experimental research in laboratory contexts.

Daehler and Greco (chapter 2) give some fascinating information about remembering in infants under three years of age, full of surprises for those who have not been aware of the ground-breaking research that has been done in this area in recent years. It is interesting that so much research on infants has been influenced by "novelty-preference" procedures as a means of getting a measurable memory response from a child with a small repertoire of communication skills, given that the research still ignores the importance of the actual context in which the infant's cognition is forming, i.e., the infant's own home.

Two central chapters in the book look at cognitive research from a more critical vantage-point. One looks at memory capabilities of preschoolers tested in more naturalistic contexts (by Paris, Newman, and Jacobs), and highlights the role of parents in structuring the mnemonic activities that the young child experiences. A chapter by Rogoff and Mistry goes even further, giving an impressive overview of research in other cultures, considering the issue of the different values placed on mnemonic activities by different societies. Even the relationship between "experimenter" and "subject" may be perceived differently in Western and non-Western

contexts. A number of examples from the Pacific region are used as illustrations.

There is a rather strange chapter on children's understanding of metaphor and figurative language by Reyna, based mainly on her own research, though this is related to a wider psycholinguistic and linguistic research field. This is followed by a literature review of research on classroom-based cognitive processing (by Marx, Winne, and Walsh), another burgeoning offshoot of developmental memory studies. This research has generated a lot of interest in educational circles and has direct implications for teaching strategies in the traditional classroom.

As if this were not enough, the book ends with a chapter by Joel Levin on 20 common "bugs" he has noted in statistical design, analysis, and interpretation of studies in the areas covered by the book. However, most of the problems mentioned are also found in other areas of psychological research. Levin is such a clear and understandable writer of statistical information that this chapter could be profitably used as a set text for any advanced statistics class.

In sum, this book covers more ground than most books of readings on a single topic, and contains chapters that would be of interest to cognitive, developmental and educational psychologists, as well as those wanting to update their knowledge in these areas. It is an excellent resource-book.

Joseph P. Forgas
Interpersonal Behaviour: The Psychology of Social Interaction

Sydney, Australia: Pergamon, 1985

Reviewed by Niki Harré

This book is designed to reach two audiences: lay people interested in interpersonal behaviour and students of social psychology. It is written in a clear style, presenting broad fields of research, and providing numerous practical activities to give the reader a feel for the area and its methodology.

The book is well organized. After an introductory chapter, the author discusses the cognitive component of social behaviour, the development of interpersonal relationships, and finally the influence of groups on

behaviour. It concludes with a brief discussion of the methodology of social psychology.

The early chapters cover most of the major research areas, with an emphasis on those cognitions which relate most directly to the construction of schemas about the self and others, giving little space to areas such as attitude formation and change which have more general applicability. One-to-one relationships are then dealt with in some depth. The chapters on social influence and interaction in groups are extremely sketchy and are limited to discussing mostly experimental evidence.

This may be explained by Forgas's theoretical framework. In his introductory chapter, he clearly prefers a symbolic interactionist approach over other theoretical models. Throughout the book he stresses the extent to which people are social products, and clearly demonstrates the importance of looking at all levels of human interaction as influential and dynamic processes in themselves. He does not, however, extend this to whatever implications it might have for society at large, something he suggests should be provided by sociology. In the later chapters, therefore, issues such as aggression, prejudice, and advertising are notably lacking.

Instead, in his final chapter he discusses social skills therapy, referring to training programmes designed to improve peoples' interactive skills. Certainly, the emphasis he places on this justifies one endeavour of social psychology very well, implying that the more we find out about human interactions, the better we can all become at it. Surely, however, a cardinal object of social psychology is to illuminate patterns of human behaviour with the possibility of changing those which lead to social inequity. On this score the book falls down.

Despite this, it is entertaining, easy to read and provides a good overview for those making their first contact with social psychology, especially lay people. It presents social psychology as interesting and worthwhile, which may be the most important impression for a book of this kind to leave.

Kelly G Shaver

The Attribution of Blame: Casuality, Responsibility and Blameworthiness

New York: Springer-Verlag, 1985

Reviewed by Peter A White

This book contributes to the continuing refinement of concepts within attribution theory through a theoretical treatment of blame. The attribution of blame is distinguished from the attribution of both casuality and responsibility, and a detailed and conceptually sophisticated process model for the ascription of blame is presented.

Shaver's theory of the attribution of blame can be described quite simply. Only persons can have blame attributed to them, and only for actions with negative consequences. Within these conditions, blame will be ascribed to the actor when the observer judges that (a) the actor's action was the sole cause of the negative consequences, (b) the actor intended his/her action, (c) the actor knew that his/her action would have those consequences, (d) the actor intended those consequences, (e) the actor acted voluntarily, (f) the actor appreciated the wrongness of the consequences, and (g) the actor's justifications and excuses for his/her action are unacceptable. Basically, (a) and (b) represent the attribution of casuality, and (c) to (f) inclusive represent the attribution of responsibility. If some of these conditions are satisfied and not others, then a judgment of moral responsibility or negligence is more appropriate.

Shaver is not suggesting that people go through all of these stages every time blame is attributed. Instead, he proposes that the theory is normative. That is, it is a theory of how blame *should* be done. The theory comes at the end of the book. Each of the components is analysed and elaborated in earlier chapters. Earlier chapters also prepare the ground in other ways, for example by discussing possible differences between actors and observers in the description of acts.

The goal of a normative theory, which strikes this reviewer as very ambitious, leads Shaver into detailed consideration of philosophy and legal practice, as well as the psychology of attribution. To achieve his goal, it is imperative for Shaver to get the philosophy right. His

accounts of philosophical treatments of causality and responsibility are informative, and undoubtedly useful for those attribution researchers who think it is advisable to worry about the philosophical aspects of these issues. On the other hand, his survey is superficial and incomplete. He ignores, for example, the causal realist school of thought in philosophy. He is not a philosopher, and therefore not equipped to review the philosophical literature with any authority. His strategy, in fact, is to select bits of the philosophy of causality and responsibility that seems relevant to a treatment of blame. His selections have more than a tinge of arbitrariness: It would have been easy to make different decisions, in many cases.

When it comes to the psychology of attribution, Shaver knows what he is talking about. But it seems to be his intention to erect his theory upon traditional attribution theory, and as a result he goes no further in criticism of it than offering one or two minor refinements. Attribution researchers sometimes talk of Kelley's multiple observation theory as normative, meaning that a person who followed the theory would make correct casual attributions. But this claim can be and has been disputed. Shaver's dependence on the validity of traditional attribution theory is therefore a dubious strategy.

If Shaver is offering a normative theory, what does he have to say about how people actually make attributions of blame? "What the theory provides is a basic structure, in terms of which. . . errors can be examined and understood." (p. 173) So we can use his normative theory as a means of identifying types of error and bias in people's attributions of blame. Its value for this purpose depends upon it being in fact the correct way to ascribe blame. Obviously one can argue over whether Shaver has achieved this goal or not.

But, as the quotation shows, Shaver shares a traditional assumption of attribution theorists that laypeople are naive scientists, trying to make the most accurate judgments they can. People are in error, by this assumption, when they get the wrong answer. It seems to me that this assumption is in-appropriate. When people make attributions of blame, they most often do so with some kind of ulterior motive or reason. For example they may blame the person or institution from which they feel they

are most likely to get some kind of recompense or damages. The right thing to do, then, is to make the attribution that is most likely to fulfill the purpose for which the attribution is made. This may very often not be the scientifically correct attribution, but it is nonetheless the correct attribution for the person involved. Trying to be scientifically correct would be an error or bias, because it would decrease one's chances of getting what one wanted.

A given theory is only normatively correct within a given frame of reference. It is therefore possible to dispute whether Shaver has the right frame of reference for a normative consideration of blame attribution. So I have to give an ambivalent summary: the book is thorough, conformist, worthwhile, and mistaken, all at once.

The probable audience for this book is a specialised one. Philosophers and legal professionals might benefit from reading about psychological approaches to blame. The book is too theoretical and advanced to be of much use to students. Its main audience, therefore, is the small corpus of attribution researchers interested in the topic of blame, together with graduate students seeking a suitable starting point for a Ph.D. project.

G. Siann

Accounting for Aggression: Perspectives on Aggression and Violence

Sydney: Allen and Unwin, 1985

Reviewed by Peter A White

Few phenomena can have had such a variety of explanations proposed for their occurrence as human aggression. Explanations for aggression have made reference to genes, instincts, physiology, brain structure and function, ethology, inner psychodynamic conflict, early childhood emotional trauma, environmental triggers, ambient temperature, anomie, deviant sub-cultures, frustration, intergroup relations, and state control in capitalist society, among others. All of these receive at least a mention to Siann's book, which is intended as a guide for students and practitioners in psychology, social work, and education, as well as interested members of the

public. Siann divides her review into five chapters, precede by a chapter on definition, and followed by an account of her own ideas.

She carries two themes through the book. The first is that writers in different areas have different definitions of the terms "aggression" and "violence", so that it is not always certain that they are talking about the same thing. Siann's analysis brings greater clarity to the murky waters of concepts of aggression, though without being the last word on the subject. Her second theme is put as follows:

"It is a central thesis of this book that scientists in social sciences will be led by their own training, experience, and indeed social position to select those approaches and interpretations that are congruent with such training, experience, and social variables." (p.71)

Included in this are biases of an ideological or a moral nature. To her credit, Siann is candid about her own background and biases as a social scientist, so that she should not be seen as above the kinds of criticism she makes of other writers. The theme is not a new one, and Siann does not in fact take it as far as she could; but it is nonetheless worthwhile to encourage her intended readership to consider issues of background, culture, morality and ideology in theory and research on aggression. Certainly no-one reading Siann's book could end up believing that explaining aggression is a simple matter, and if readers can be induced by Siann's example to evaluate their own ways of thinking, then one of the aims of the book will have been accomplished.

Siann is at her best in presenting summaries of the ideas and research of the more important representatives of the various schools of thought in aggression. There is no substitute for reading the original, but newcomers to the topic will find her account a balanced and informative introduction. I was amused to learn that Konrad Lorenz gives only two examples of his concept of "spontaneous aggression", one involving chichlid fish, and the other involving Lorenz's aunt.

Her attempt to evaluate the various approaches are weaker, however. Often her evaluation consists of no more than a series of assertions, usually beginning "I believe. . .", or "It seems to me that. . .". When she does present critical argument, it is sometimes flawed

in elementary ways. Some examples are worth considering.

Siann criticises physiological researchers for not taking account of social and personal factors in aggression — for being, in fact, "essentially reductionist". This is an unreasonable criticism: There is a difference between claiming that social and personal factors are not involved in aggression, searching for an explanation for their involvement, and deciding not to look at them because they fall outside one's interests. Siann does not demonstrate that physiological researchers do only the first of these, or that there is anything wrong with doing the other two. It would be wrong to reject physiological accounts simply because of sins of omission.

The ethology chapter contains a similar error of reasoning. Ethologists depend, in explaining human behaviour, upon argument by analogy. But in criticising this, Siann talks as if ethologists think that making the analogy is all that is required of them. In fact, analogies are potential sources of testable propositions, not of dogma: Therefore it would be wrong to rule argument by analogy out of court, better to try to recognise its uses and limitations.

In the chapter on experimental psychology Siann makes the mistake of oversimplification: Experimental psychologists do not all share a common set of assumptions and adherence to "positivistic methodology". She rejects laboratory experiments on the grounds that they don't seem like real life: In doing so she talks about validity without differentiating between face validity, internal validity, and external validity; but the clear implication is that in her view lack of face validity entails, or is actually identical with, lack of external validity.

What concerns me about these shortcomings is that they serve to reinforce the prejudices of her social scientist audience. This would be unfortunate: a critical approach is praiseworthy, but only when the criticism is just and insightful. Points of view should not be rejected for the wrong reason.

The final chapter presenting her own ideas betrays a lack of understanding of how a theory should, or should not, be constructed. There is no real organisation in the ideas; the ideas are not analysed very far (for example, she treats "sensation-seeking" as a kind of intention, without considering whether it might

not be); and she supports her ideas with a very selective search for confirmatory evidence, sometimes failing to note plausible alternative interpretations. Too much of this evidence is informal anecdote.

One is left with the impression that research on aggression reveals most of all the limitations on human ability to comprehend complex interacting variables. Everyone, Siann included, selects out from the welter of possible explanations a small number that seems right to them: I wonder whether there is any scientific advantage in this, or whether oversimplification is the only means people have of coming to feel comfortable with the phenomenon.

This is a useful book, on the whole well suited to its role. It is disappointing that its virtues should be interwoven with shortcomings of an elementary and regrettable nature.

William Ickes (Ed).

Compatible and Incompatible Relationships

New York: Springer-Verlag, 1985

Pp. 388.

Reviewed by Gregory L. White

The last 15 years or so has seen an explosion of theoretical and empirical work within social psychology on interpersonal relationships. Two streams of interest have emerged, one focused on the development of relationships and the other on the dissolution of relationships. In this volume William Ickes has brought together 14 original chapters penned by well-known authors that attempt the necessary integration of these two streams of work.

This is a highly satisfying collection, intended for both the advanced student and for the active researcher. It will not be of immediate use to those with an interest in applied application to dysfunctional relationships. While most articles review research related to the chapter topic, there is a clear emphasis on the presentation and development of theory. In most cases, the goal of the theoretical elaboration is to systematically address the processes that underlie the development, maintenance, and dissolution of a range of interpersonal relationships. This is done through the device of organizing discussion around the concept of compatibility.

The chapters are organized into five parts. The initial three chapters are focused on comparative and developmental perspectives on relationships. The chapters discuss animal behaviour, parent-infant relationships, and children's peer and sibling relationships. The two new chapters are based on social exchange theory, one on equity in intimate relationships and the other on distinctions between exchange and communal relationships. Part three is concerned with emotional interdependence, with one chapter on relationships among emotion, intimacy, and compatibility and another concerned with the loneliness and "limerance" or lovesickness. Part four has five chapters focused on different aspects of compatibility of personality and cognitive functioning. Chapter topics are sex-role influences, negotiation, and affirmation of self-esteem and self-concept, interpersonal perception and attribution processes in close relationships, and "transactive memory", or the development of mutually held understandings about the dyad qua dyad. The final section of the book has two chapters on marriage, one discussing compatibility in mate selection and marriage and the second on assessment and treatment of incompatible marriage, largely from the framework of behavioural marital therapy. This last chapter seems out of place with the others.

A problem with edited volumes of this sort, especially when a number of like volumes are also available, is to present discussions that are not restatements of previous work by the authors or are redundant with other reviews. Ickes has been mainly successful at getting his contributors to make fresh and original presentations. To my reading, only the chapters on equity theory, compatibility in marriage, and marital therapy fail at this goal.

Some of the chapters are especially excellent for their theoretical discussion and integration of previous research. Roger Knudson presents a well-written symbolic-interactionist view of mutual identity confirmation, particularly within marriage. He then draws on transgenerational family systems theory to extend the concept of compatibility to compatibility among systems of beliefs and myths between the family cultures of the two marriage partners. This integration of systems and symbolic interactionist theories is novel. Daniel

Wgner, Toni Giuiano, and Paula Hertel have a somewhat odd but interesting chapter that starts from the old notions of group mind and emerges with a theory of transactional memory solidly based on cognitive psychology, person perception, and bargaining literatures. The chapter is concerned with the processes by which two people come to share similar knowledge structures about themselves as individuals and as a dyad, as well as about other important social events.

Ickes himself has an excellent chapter on sex roles that goes beyond the usual catalogue of obtained differences and avoids overreliance on the idea of sex role stereotypes. Rather, he focuses on socially and dyadically constructed meanings of masculine and feminine and how such meanings are involved in the negotiation of relationship, the development of intimacy, and the ability of relationships to sustain themselves through internal and external challenges. Finally, Phillip Shaver and Cindy Hazan have an interesting chapter on how loneliness and lovesickness can generate compatibility while simultaneously sowing the seeds for subsequent relationship dissolution.

As a potential text for a graduate class, this book offers a wide range of topics and theoretical approaches. Not much within the general area of interpersonal relationships is left out, so the breadth of coverage is adequate. Where the book really shines, though, is in the attempt to order previous research from theoretical perspectives. The writing is well-edited, rarely turgid or ponderous, and occasionally witty and self-expressive. The index is adequate. Each chapter ends with its own references.

Raymond B. Cattell

Human Motivation and the Dynamic Calculus

New York: Praeger, 1985

Pp. 164. \$US31.50

Reviewed by Gregory J. Boyle

Raymond B. Cattell, Ph.D., D.Sc. (London) is a Distinguished Research Professor Emeritus of the University of Illinois, where he was the Director of the Laboratory of Personality and Group Behaviour for some 30 years. He has been the G. Stanley Hall Professor of Psychology at Clark University and he has

taught personality and social psychology at Duke, Harvard and London (Exeter) Universities. Most recently, Professor Cattell has been a member of the graduate faculty in psychology at the University of Hawaii. Cattell is the winner of several awards for his scientific contributions to psychology. He has received the Darwin Fellowship, the New York Academy of Sciences Wenner-Gren prize, election to the British Psychological Society's register of distinguished foreign psychologists, and selection by the American Psychological Association and the American Educational Research Association for the 1982 ETS Citation for Distinguished Service to Measurement. Cattell was the inaugural President of the Society of Multivariate Experimental Psychology. Also he helped found the Institute for Personality and Ability Testing, which has become a highly reputed and internationally recognised test publishing company.

Cattell has considerably advanced psychometric theory through numerous pioneering contributions. Concomitantly, he has introduced many innovations in test design and measurement. Fundamental to these advances has been his insistence on the centrality of methodologically sound factor analysis to empirical research (a technology which he has greatly influenced also). As Spielberger (in the introduction to Cattell, 1983) stated, Cattell's "highly sophisticated approach to the construction of psychological scales has produced numerous tests and inventories that provide basic yardsticks for assessing the most significant dimensions of behaviour. The extensive citations of his work in the scientific literature rank him with Freud, Piaget and Eysenck in terms of his influence on contemporary psychological research." In addition, Cattell's enormous productivity has been enshrined in some 600 publications, mostly in international journals of psychology, including some 50 scholarly books, along with numerous book chapters and monographs. Despite this prodigious achievement, Cattell's highly creative research and writing has often been overlooked among mainstream psychologists. This is regrettable, as Cattell has made many important contributions to psychological research and practice. Moreover, in much of his more recent theoretical and scientific analysis of human behaviour, Cattell has

clearly broken new ground in advancing the frontiers of knowledge.

Most books on human motivation which are not particularly quantitatively oriented are reasonably easy to read. Cattell's most recent book (like most of his publications) is not so easily read by those who are unfamiliar with Cattellian terminology and ideas. The book is extremely condensed and Cattell has widely recommended that it needs teaching to some extent. However, this latest book directly confronts the very real complexity of human motivation in terms of an algebraic and quantitative framework. The book is comprised of complex arguments, definitions and concepts, all tied together with interlocking mathematical formulae. Even though much of the material has been presented in a number of previous publications, including his 1975 book (with Dennis Child), *Motivation and Dynamic Structure*, as well as his monumental 1980/1981 book, *Personality and Learning Theory*, and more recently in his 1983 book, *Structured Personality-Learning Theory: A Wholistic Multivariate Research Approach*, this latest book nicely brings together in a single volume, the basic essentials of Cattell's theory and research in the motivational dynamic area. As such, it provides an erudite, but useful textbook for students of motivations.

The book comprises some 24 chapters, commencing with the famous dichotomously derived, multi-component view of motive structures (as opposed to the simpler univariate view inherent in the sociological opinionnaire survey). The book includes chapters on the dynamic structures — ergs and sems (the former are biologically based innate drives, whereas the latter are culturally acquired sentiment structures, which according to Cattell, ultimately subordinate to the more fundamental, ultimately subsistate), the dynamic lattice and its complexity of possible interrelationships, the growth of the dynamic motivation factors, the quantitative estimation of ergic and semic strengths and the quantification of conflicts between them, as well as several chapters on the implications of structured personality-learning theory in regard to the dynamics of human motivation. However, the book is sprinkled with new ideas indicative of the flexibility and fluency of Cattell's conceptualisation abilities.

Cattell's emphasis on both intrapersonal and situational determinants in human motivation is clearly demonstrated in his elaborate and somewhat abstruse dynamic specification equations. The level of abstraction of some of these mathematical formulations parallel that often seen in the hard sciences such as physics or engineering. Given the apparent complexity of even the lower-order interactions of ergic and semic structures, formulae such as those proposed by Cattell seem warranted. Unfortunately it seems well nigh impossible to empirically quantify such formulations at the present time (except within the rather specific framework of Cattell's own multivariate measurement instruments). Generally though, there are simply too many unknowns in Cattell's dynamic specification equations. Objections to the Hullian psychological system seem even more applicable to Cattell, whose flight into mathematical conceptualisation has been in advance of empirical confirmation. Irrespective of this dilemma, the book does contain a useful summary chapter of the 37 major mathematical formulae proposed within the dynamic motivational area, which have not previously been brought together in summary form.

In conclusion, Cattell has proposed an ambitious, mathematically defined theory of human motivation which he labels the *Dynamic Calculus*. His research is laudable, partially based on empirical data, and clearly very creative. That Cattell does not completely achieve his goal is indicative of the complexity of the field, rather than any lack of effort or imagination on his part. Cattell believes that human motivation is quantifiable and potentially predictable. Although much empirical investigation remains to be undertaken before substantive conclusions can be reached, Cattell has at least provided 'plenty of meat' for these investigators 'hungry enough to savour its delights'. No other scientific psychologist has ever done any better than Cattell in attempting to quantitatively account for all the significant variables and their concomitant interactions in the field of motivational dynamics. Cattell, the scientist, has attempted to base his analyses on multivariate objective data under experimental control. After all, measurement is the *sine qua non* of scientific enterprise. Armchair theories of motivation have little place in

contemporary psychology unless they can be subjected to the rigours of empirical investigation. Cattell has left in this latest book a legacy of countless hypotheses and sub-hypotheses for future investigators. In many ways, this book may provide an important point of departure for scientific psychologists interested in pushing forward the frontiers of knowledge in the field of motivational dynamics. However, readers who are unfamiliar with Cattellian concepts would be advised to read his 1977 book (with Paul Kline), *Scientific Analysis of Personality and Motivation*, before attempting to assimilate the contents of this latest book. For those who do make the effort to understand what Cattell has to offer (and this effort may be considerable), the insights should be abundant.

N.M. Weinberger, J.L. McGaugh, and G. Lynch (Eds.)

Memory Systems of the Brain

New York: Guilford Press, 1985

Reviewed by M.C. Corballis

Memory is a phenomenon that spans many levels of psychological enquiry. At one extreme are the elaborate cognitive models, couched in the metaphors of the digital computer, with little reference to biological processes or the brain. At the other extreme lies the search for biochemical changes, induced by learning, that alter the firing of individual neurons, but there is little regard for the psychological properties of memory.

This volume is the product of a conference on the neurobiology of learning and memory, held in California in 1984. Although it suffers the discontinuities that are inevitable in any collection of papers by different authors, it is more cohesive than most, and its contributors were well chosen to bridge the gap between the molar and molecular. As befits the title of the conference, however, the biological theme is uppermost, and there is relatively little reference to cognitive or computer-based approaches.

There are three sections. The first is on brain systems and memory, with an emphasis on physiological and biochemical aspects. Much of the research effort is focused on the

hippocampus, which has seemingly replaced the pineal body as the seat of the soul. This structure was surgically removed bilaterally in the famous patient, H.M., in the hope that it would prevent his uncontrollable epileptic seizures. In this respect, the operation was largely successful, but H.M. was left with a dense amnesia, especially for events in his life that have occurred since the operation. He is said to be the most extensively studied patient in the history of neuropsychological testing, yet each new investigation into his cognitive skills is as fresh and novel to him as if it were the first.

At the neurophysiological level the best evidence for the involvement of the hippocampus in memory is the phenomenon of long-term potentiation (LTP), in which high-frequency electrical stimulation within the hippocampus of the rat induces lasting changes in synaptic strength. In the one local contribution to this volume, Abraham and Goddard of the University of Otago present detailed parametric evidence that there may be as many as five distinct traces induced by LTP, in welcome recognition of the multifaceted nature of memory.

But the neurophysiological evidence bears an uneasy relation to the evidence from H.M. and other amnesics. The work on LTP suggests for example that the hippocampus may be a site for long-lasting memory storage, yet the evidence from H.M. shows that many (but not all) early memories remain intact following hippocampal removal, implying that the hippocampus is critically involved in the formation of memories but is not the site of them. Moreover much of the neurophysiological evidence on hippocampal function in nonhuman primates has focused on the role of the hippocampus as a "cognitive map" rather than on its role in memory *per se*. Barnes and McNaughton examine the evidence for the memorial component in the spatial processing material component of the hippocampus, but fail to achieve a complete rapprochement between the conflicting lines of evidence.

The second section is on comparative aspects of learning and memory, and includes delightful chapters by Gould and on the varieties of learning and memory, some remarkably sophisticated, in honey bees, and by Shettleworth on food storing in birds. The study of

memory has been confined too long within narrow experimental paradigms, in both human and animal laboratories. These comparative studies add a welcome ecological dimension, complementing the trend in human studies to emphasize everyday, practical aspects of memory, such as eyewitness testimony and memory for real-life events.

The final section is on learning, memory, and cognitive processes. It is however something of a mixed bag. Gallagher's chapter on the neurochemical modulation of learning and memory might equally have been placed in the first section; Mackintosh's chapter on the varieties on conditioning seems peculiarly old-fashioned in its terminology in an age when cognitive theories dominate, but is no less persuasive for this; Schacter's review of multiple forms of memory in humans and animals also overlaps with the second section, and in fact identifies a theme that recurs throughout the book. Crowder provides a short but incisive commentary from the point of view of a cognitive psychologist, but otherwise traditional cognitive models are not much in evidence. Much of the final section is concerned with the nature of amnesia, and the question of whether there is more than one memory system implicated in the varieties of amnesia.

Each of the three sections comprises original

contributions followed by so-called "critical commentaries", although it is sometimes hard to discern the difference. Nevertheless this structure generates several debates between participants and allows several important themes to emerge. In the second section, for instance, Macphail argues that learning capacity does not vary between species, but this is sharply refuted by Rosenzweig and Glickman. In the final section, Weiskrantz closely examines the evidence for the widely held view that there are two forms of amnesia, a "medial temporal" type (of which H.M. is an example) and a "diencephalic" type (including Korsakoff amnesics). He concludes that the distinction is not supported by the evidence, but the dual view is defended in the final chapter by Zola-Morgan and Squire.

Overall, this is an impressive book of its type, although one senses that the information it contains will rapidly become outdated. It must have been a good conference, since most of the authors seem aware of one another's work and of the breadth of phenomena to be explained. The book will be useful for those who work in the field, and perhaps for senior students studying memory. The more general reader will probably not want to buy it, but may well find it a helpful source of reference on specific aspects of memory.