tween "observable once in 1974" and "observable generally." The sky changes, and people are fallible observers. Also, one sees possible contamination from personal preconceptions, either of the calendar or of cultural astronomy or stemming from inexperience with the real sky. Remington uses the phrase "western cognitive category of astronomy," in which (gobbledygook aside) "western" is probably equated with European. She also infers a naked-eye observation of comet Kohoutek when it was far past maximum brightness, and maybe invisible. Wedel patronizes the Pawnee for calling Cassiopeia "turkey foot" because of a "fancied resemblance"; any fool can see that it looks like a queen on a throne! He also commits two geometric errors that are less important, but not negligible.

Still, I do not wish to leave a negative impression of *Native American Astronomy*; I have dwelt on the negative aspects because of space limitations only. This book is an important step in the process of raising archeoastronomy of the Americas to the "critical mass" needed for significant progress. It is a very interesting and engaging statement of the current status of the endeavor. I hope it will attract the attention of more astronomers, because there is much to be done here.

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Mnemonic Processing

Perspectives on the Development of Memory and Cognition. ROBERT V. KAIL, JR., and JOHN W. HAGEN, Eds. Erlbaum, Hillsdale, N.J., 1977 (distributor, Halsted [Wiley], New York). xiv, 498 pp. $19.95.

In this comprehensive review of research on the development of memory, various authors interpret memory more or less broadly, but all subscribe to the view that it is not a unitary or simple process and that it cannot be separated from the rest of cognition. Indeed, Kail and Siegel equate mnemonic processing with cognitive processing in general, and Trabasso, in a chapter on transitive inferences, lists encoding, representing, recoding, transforming, ordering, listing, scanning, matching, and retrieving, "to name a few," as processes that fall under the rubric of memory. This broad conception is probably healthy, for "memory" is a common language term, not a theoretical one, and it also gives the book a wider scope than it would otherwise have had.

In spite of the broad view of what memory is, the experimental paradigms in the first half of the book are for the most part limited to free recall of lists of words, verbatim recall of serial order, and paired-associate learning. Paris and Lindauer, however, describe some of the early work on comprehension and memory for prose and other contextually rich materials, an area of research that is becoming increasingly important. The second half of the book branches out into more general aspects of cognition. Especially recommended are Cole and Scribner's chapter on cross-cultural studies, which by indirection suggests the narrowness of much American research, and Meacham's chapter on Soviet investigations of memory, work that is theoretically important and relatively unknown to the American audience.

There is surprisingly little Piaget in these pages considering his dominant role in developmental psychology, perhaps because the translation of his work on memory is relatively recent. Also, as Liben notes in her chapter on the few American attempts to investigate the Piagetian claims for qualitative changes in the memory code, the Genevan emphasis on developmental changes in the structure of memory is not in the mainstream of American studies, which have stressed the development of skills (read strategies). The emphasis on process, as opposed to structure, is evident throughout the book. Belmont and Butterfield are vehemently antistructuralist, whereas Campione and Brown suggest that without better theory structural changes are difficult to define, let alone measure. Interestingly enough, the emphasis on process tends not to be reflected in the theoretical views of memory within which most of the authors interpret developmental phenomena. There is more talk of transfer between short- and long-term stores than of depth or elaborateness of processing or the growth of semantic networks. Refreshing exceptions are the Meacham chapter and Moely's discussion of organizational factors in memory.

The emphasis on process is reflected in the major theme of the book: memory development is primarily due to the growth of deliberate mnemonic strategies. The assumption that strategies are consciously used is explicit in Flavell and Wellman's chapter on metamemory and implicit elsewhere. Not only does this emphasis underrate the importance of growth in the size and elaborateness of semantic memory, it tends to ignore the fact that strategies, as evidenced by systematic performance within and between tasks, are often carried out without awareness. Too much of our encoding and retrieval is automatic (or at least takes place without conscious monitoring) for a strategy-based view to tell the whole story of developmental improvements. Nevertheless, the book accurately reflects the theory and research of the past ten years. It is a sophisticated and interesting collection, well worth reading.

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