that impede goal-attainment ("interfering interchain connections"). Second, there is the sometimes difficult but frequently crucial distinction between interactional events that can be described (by the participants themselves or by uninvolved observers) and causal conditions for these events, which can only be inferred. As various authors turn to these (and other) aspects of the general framework, bringing different conceptual, methodological, and substantive points to bear, the capacity of the framework to reveal connections among apparently disparate topics becomes increasingly evident.

Following the two initial chapters, there are eight chapters on specific topics. A chapter on short-term interactions (McClintock) and one on longer-term patterns of development and change (Levinger) examine the sequence of interactions in a close relationship. Two other chapters discuss relational conflict (Peterson) and therapeutic remediation of distressed relationships (Christensen). The remaining four chapters address emotion (Berscheid), power (Huston), roles and gender (Peplau), and love and commitment (Kelley). The book concludes with a detailed summary of the various methodological approaches taken and problems encountered in empirical research on close relationships (Harvey, Christensen, and McClintock) and a chapter (Kelley) pointing out the relevance of research on close relationships to other domains of social science inquiry.

Overall, the book is scholarly and readable (especially in light of the complexity of much that is considered). There is no question that it will become a major source for investigators and students interested in close relationships.

If the book has a serious flaw, it lies in the failure of most of the authors to go beyond a review and organization of existing material to an original theoretical statement. One becomes most aware of this shortcoming by virtue of Berscheid's chapter on emotion, in which she does take that extra step and formulates an extraordinarily stimulating model for understanding the relational conditions conducive to emotional response. However, through its careful reviews and marked attention to organizing principles, the present volume may well serve as a necessary ingredient for fostering future theoretical endeavors by both its authors and its readers.

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Mississippi Valley Archeology

Archaeology of the Central Mississippi Valley. DAN F. MORSE and PHYLLIS A. MORSE. Academic Press, New York, 1983. xx, 345 pp., illus. $39.50. New World Archaeological Record.

It is fitting that 101 years after Colonel Norris, a field agent for the Bureau of American Ethnology Division of Mound Exploration working under the direction of Cyrus Thomas, conducted an archeological survey of the Central Mississippi Valley, a volume be published synthesizing knowledge about the archeological resources of the region. Extending from near the mouth of the Ohio River to the mouth of the Arkansas River, a distance of 800 kilometers, the Central Mississippi Valley is defined by the Morses as the alluvial valley bounded on the east by the Mississippi River and on the west by the Ozark Highland and Grand Prairie. An overview of past relationships between humans and land in the Central Mississippi Valley is presented succinctly and in sufficient detail to introduce many new data.

The volume begins with a brief review of the environment of the region including geological history, climate, geomorphology, soils, and biota. This landscape, which contains archeological resources in extreme quantity, has been ravaged by modern agriculture. Archeological preservation, through research and the compilation of data, is a battle fought only once, and though the effort has been noble the battle is lost in the Central Mississippi Valley. Even with ample personnel and funding the potential for reconstructing settlement patterns from archeological sites that existed 10 years ago no longer exists.

In the second chapter of the volume an overview of the history of archeological research in the region is presented, moving from observations made by early naturalists such as Henry Schoolcraft and Thomas Nuttall through work conducted by the St. Louis Academy of Science, Captain C. W. Riggs, and Captain Wilford Hall, to the first well-documented archeological excavations conducted along the St. Francis River by Edwin Curtis in 1879. Work by the Bureau of American Ethnology, Gerard Fowke, Clarence B. Moore, James K. Hampson, Samuel C. Dellinger, Jesse Wrench, Brewton Berry, and Carl Chapman is reviewed. The formation of the Lower Mississippi Valley Survey in 1940 is hailed as the beginning of modern archeology in the region. A brief review of archeological research since that time is also presented. To my knowledge this chapter is the first published history of archeological research unique to this region.

After discussions of recovery techniques and data interpretation and incorporation, a brief overview of the archeological sequence spanning approximately 12,000 years is presented, beginning with the Paleo-Indian Period and ending with the Euro-American Period. The following 10 chapters are more detailed accounts of these chronological/cultural divisions. At the beginning of each chapter a map illustrates important sites and archeological phases unique to the cultural period to be discussed. Each chapter contains ample photographs and artistic renderings of artifacts, site plans, excavations, and other subjects discussed in the text. Most of the illustrations have not been previously published and stem from research carried out by the authors. The simple traditional terminology for the cultural stages in the valley is not followed. For example, "Early Archaic" is replaced with the "Early Corner-Notched Horizon" and "Middle Archaic" becomes the "Hypsithermal Archaic" followed by the "Poverty Point" instead of the "Late Archaic" period. Similar treatment is afforded the traditional Woodland Period, and Mississippian is divided not into Early and Late Mississippian but Early Period, Middle Period, and Late Period Mississippian. The new terminology reflects important cultural and environmental changes.

The treatment of the Paleo-Indian Period includes a presentation on finds of Pleistocene fauna in the region. Although the quantity of finds has been impressive, only one has been putatively associated with human artifacts. A summary of fluted point finds is presented, and somewhat tenuous cultural reconstruction follows.

Important new data on the period designated Dalton Efflorescence are synthesized with examples drawn from the Brand and Sloan sites. The authors' long-standing interest in Dalton research is reflected in this publication. A convincing argument is presented for a low human population density in the lowland portion of the Central Valley during the Hypsithermal and for a major increase in population during the following 2500 years during the Poverty Point Period.

Significant previously unpublished data are presented on the McCarty site, an Early Woodland locus, providing a better understanding of Tchula expressions in the Central Mississippi Valley, and the Hopewellian is represented by a

discussion of the Pinson and Helena mounds. New data are presented on the Cow Mound and Keller phases of the Marksville Period.

The Baytown Period presentation contains a review of the distribution of the Baytown and Barnes traditions in the region with emphasis on the Hoecake Phase in the Cairo Lowland of southeastern Missouri.

In chapters 10, 11, and 12 the ascension, fluorescence, and ultimate demise of the Mississippian lifeway are traced. The authors point to the Cairo Lowland as a place central to Mississippian development, an idea with which I do not agree. There is no doubt that inhabitants of the Cairo Lowland shared in the development of Mississippian, but it probably developed simultaneously over most of the Bootheel of southeastern Missouri, in the extreme northeastern portion of Arkansas, and in the stream valleys draining the eastern Ozarks. In the seventh or perhaps eighth century A.D. there developed an important tradition marked by the presence of shell-tempered, red-filmed, or highly oxidized ceramics typified by globular jar forms with recurved rims, a tradition that must be considered directly on the cultural trajectory that ultimately led to that lifeway typified by the complex sociopolitical organization after about A.D. 1150. The famous Cahokia site to the north is no place to look for the origins of this tradition, for, as several recent studies have indicated, while Cahokia was still using ceramics tempered with crushed limestone shell-tempered, red-filmed jars, presumably from southeastern Missouri, were being acquired through trade.

A credible review of Mississippian consolidation after about A.D. 1000 and Mississippian nucleation about A.D. 1350 is presented, with a description of the subsequent abandonment of that area where the Mississippian lifeway was first forged. The authors attempt to tie provinces visited by the De Soto expedition with archeological phases in eastern Arkansas.

The volume ends with a chapter on historical archeology in the Central Mississippi Valley. The Spanish and French periods are discussed as well as the archeology of the 19th century after the Louisiana Purchase. There follows an intriguing documentation of a case of archeological counterfeiting involving the manufacture of bizarre sandstone sculptures, allegedly by a Jonesboro, Arkansas, resident in the 1920's and 1930's, and the public's belief in the authenticity of these specimens, reputedly of Aztec origin.

Though I do not agree with all the views presented in this work I fully appreciate it as the first serious attempt to bring together the full range of archeological resources in the Central Mississippi Valley. Though it is not the last word on many subjects with which it deals, it provides new insights and points to new directions for research. I recommend it to anyone interested in North American archeology.

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Embryology

Time, Space, and Pattern in Embryonic Development. WILLIAM R. JEFFERY and RUDOLF A. RAFF, Eds. Liss, New York, 1983. xviii, 396 pp., illus. $44. MBL Lectures in Biology, vol. 2. Based on a lecture series, Woods Hole, Mass., 1982.

The choice of topics in this book shows how much can be learned from the comparative analysis of the same developmental process in different organisms. The book also shows that we are now in a position to ask meaningful questions about where and when in the embryo certain events occur and to address questions concerning the molecular basis of a pattern and the nature and the mode of operation of morphogenetic determinants.

Although the basic mechanisms of gene expression are similar in prokaryotes and eukaryotes, the egg is not a bigger and better *E. coli*. At the time of fertilization the egg is endowed with a developmental program that results from the expression of its own genes during oogenesis. A classical example, discovered half a century ago, is that in the mollusks the chirality of the spiral cleavage is controlled by maternal genes expressed during oogenesis. Indeed, dextral cleavage depends on a product of the dominant gene (Freeman). Chapters by Mahowald and Kaufman show how much the astute analysis of some *Drosophila* mutants, when combined with the new tools provided by recombinant DNA, may contribute to the understanding of certain developmental events.

It was mainly the work of Davidson and his group that led to the finding that the expression of individual genes changes during development; and changes in gene expression are paralleled by changes in the pattern of proteins synthetized at different times during development (Brandhorst *et al.*). However, the significant role played by post-translational events should not be overlooked. Of particular interest is the case of the mollusk *Spisula*, in which different messenger RNA's are selected from the pool of maternal templates for translation at different times after fertilization. In addition, not only do the first two blastomeres synthesize different RNA's but when separated the embryos developing from the two halves fail to synthesize one protein typical of the larva (Ruderman *et al.*). This interesting finding together with the work on mouse embryo described by Johnson and Pratt highlights the role of interactions between blastomeres in the control of differentiation. New vistas are opened with the ingenious experiments in fusing unfertilized and fertilized sea urchin eggs described by Bennett and Mazia.

The combination of DNA cloning, monoclonal antibodies, in situ hybridization, and blastomere isolation has led to the long-sought demonstration that different cell lines synthesize different messenger RNA's and different proteins at different times (Klein *et al.*; Angerer and Angerer; Harkey; McClay *et al.*). However, caution should be exercised in inferring the localization of macromolecules from cell fractionation procedures. The nuclear localization of the histone mRNA in the sea urchin egg is a case in point (Raff).

The vegetal body in the polar lobe of annelid embryos (Dohmen) and the cytoplasmic component that is selectively segregated in the germ line of the nematode *Caenorhabditis* (Wood *et al.*) are examples of morphogenetic determinants. The anterior and posterior determinant proteins in *Smittia* (Kalthoff) are intriguing. The ascidian embryo is one of the classical materials for the study of morphogenetic determinants. Now it has been discovered by Jeffery that the cytoskeletal elements are differently organized in the different blastomeres and that they are associated with mRNA. This association may provide the basis for the establishment of specific patterns.

Although the reorganization of the egg following fertilization has long been known and its importance for the establishment of the embryonic axes generally acknowledged, its molecular basis is still very poorly understood. In this respect a discussion by Gerhart *et al.* of the polarity of the amphibian egg provides food for thought.