



**SAA**  
SOCIETY FOR AMERICAN ARCHAEOLOGY

SOCIETY FOR AMERICAN ARCHAEOLOGY

ABSTRACTS  
OF THE  
59TH ANNUAL  
MEETING

April 20-24, 1994 • Disneyland Hotel • Anaheim, California



# SOCIETY FOR AMERICAN ARCHAEOLOGY

## ABSTRACTS

### of the 59th Annual Meeting

April 20-24, 1994

Disneyland Hotel—Anaheim, California USA

The annual meeting of the Society for American Archaeology provides a forum for the dissemination of knowledge and discussion. The views expressed at the sessions are solely those of the speakers and the Society does not endorse, approve, or censor them. Descriptions of events and titles are those of the organizers, not the Society.

Published by the  
Society for American Archaeology  
900 Second Street NE #12  
Washington DC 20002 USA  
Telephone +1 202/789-8200  
Fax +1 202/789-0284

## SOCIETY FOR AMERICAN ARCHAEOLOGY Fifty-Ninth Annual Meeting

### 1994 SAA PROGRAM COMMITTEE

#### Chair

J. Daniel Rogers  
*National Museum of Natural History  
Smithsonian Institution*

#### Assistant Program Chairs

Mary Goodman  
Michelle L. Kruse  
Jane McMullan

#### Reviewers

Jeanne E. Arnold  
*University of California, Los Angeles*

Timothy G. Baugh  
*Western Cultural Resource Management*

James A. Brown  
*Northwestern University*

Karen M. Dohm  
*National Museum of Natural History  
Smithsonian Institution*

Elizabeth Graham  
*York University*

Ramiro Matos  
*San Marcos University and  
National Museum of Natural History  
Smithsonian Institution*

Katherine A. Spielmann  
*Arizona State University*

Patricia A. Wattenmaker  
*University of Virginia*

Samuel M. Wilson  
*University of Texas*

#### Local Arrangements

Glenn Russell  
*University of California, Los Angeles*

### SAA EXECUTIVE BOARD

#### Officers

Bruce D. Smith  
*President*

Bruce E. Rippeteau  
*Secretary*

Vincas P. Steponaitis  
*Treasurer*

W. Frederick Limp  
*Treasurer-elect*

#### Board Members-at-large

Roger Anyon  
Diane Gifford-Gonzalez  
William H. Marquardt  
John Rick  
Katharina J. Schreiber  
Julie Stein

#### SAA STAFF

Ralph Johnson  
*Executive Director*

David L. Whitlock  
*Director, Finance and Administration*

Brigid Brady-de Lambert  
*Manager, Membership Services*

Elaine Talbott  
*Manager, Accounting Services*

Janet M. Walker  
*Manager, Publications*

Sarah Canadine Bayne  
*Administrative Assistant*

Copyright © 1994 by the Society for American Archaeology

All rights reserved. No part of this publication may be reprinted in any form or by any means without prior permission from the publisher.





## SYMPOSIUM, FORUM, AND WORKSHOP ABSTRACTS

**[1] Sponsored Forum: STRAIGHT FROM THE HORSE'S MOUTH: FRANCIS P. McMANAMON ANSWERS YOUR NAGPRA QUESTIONS (SAA Task Force on Repatriation)**

Frank McManamon, Departmental Consulting Archaeologist for the National Park Service will make a brief statement concerning the implementation of Native American Graves Protection and Repatriation Act and its draft regulations. The remainder of the session is devoted to NAGPRA-related questions and discussion from the audience. This forum will clarify the effects of NAGPRA on current and future excavation procedures and on the disposition of human remains, funerary objects, and other items that are in existing museum collections or result from ongoing work. It is directed to all archaeologists, especially individuals involved in the implementation of NAGPRA, archaeologists involved in excavations subject to NAGPRA, and those concerned with research collections.

**[2] Invited Symposium: HUMAN EVOLUTION: INTERACTION OF BIOLOGY AND BEHAVIOR**

An anthropological tenant, derived from the nineteenth century formulation of the discipline, asserts a bidirectional interaction between biology and behavior. In archaeology the use—and also misuse—of this assumption is well documented and supposed biological discontinuities have been equated with and served to buttress cultural distinctions. In recent years both DNA analyses as well as archaeological and paleontological finds from Europe, Africa, and the Near East have caused both archaeologists and biologists to re-examine such assumptions. This symposium uses data derived from different time periods and regions of the world to examine how, in an extended time frame, biology and behavior interact.

**[3] Invited and Sponsored Symposium: ARCHAEOLOGY IN THE TWENTY-FIRST CENTURY (American Society for Conservation Archaeology)**

Recognizing the 20th anniversary of the passing of the Moss-Bennett bill and founding of the American Society for Conservation Archaeology in 1974, we seek a broad and deep look at the ideal future for U.S. and world archeology. North American archeology has been transformed since 1974 shifting from an "esoteric enclave" of higher education to broad involvement in the economic, cultural, and political life of our nations. Our environment is dynamic, with complexity and change increasing at a quantum pace. This program initiates conversations on the long-term best interests of American archeology from a holistic perspective.

**[4] Symposium: THE ORIGINS OF SETTLED VILLAGE LIFE IN SOUTHWESTERN ASIA: THE VIEW FROM EASTERN ANATOLIA**

Eastern Anatolia is geographically and culturally integral to any consideration of the dynamics of culture change in southwestern Asia. However, until recently, only minimal data from early settled village communities have been available from this critical region. Recent surveys and excavations in eastern Anatolia are beginning to fill this gap in our data. In so doing, they will likely force revision of existing models concerning the origins of settled village life in southwestern Asia. The papers in this session examine the impact of the new Anatolian data on our understanding of the origins of sedentism and domestication.

**[5] Symposium: THE YALAHAU REGIONAL HUMAN ECOLOGY PROJECT: ANCIENT MAYA POLITICAL STRUCTURE AND RESOURCE MANAGEMENT IN THE NORTHERN LOWLANDS**

Recently initiated investigations at the major center of Naranjal and associated sites in the extensive freshwater wetland zones of northwestern Quintana Roo provide new perspectives on the prehistory of the northern Maya lowlands. Settlement survey and reconnaissance document use of land and water resources of this unique wetland zone. Comparative studies of monumental architectural styles and of ancient road systems provide evidence for local and regional interaction. Multiple lines of evidence suggest widespread interaction across the northern peninsula, linking the eastern region of Naranjal with developments at such Early Classic centers as Ake and Izamal.

**[6] Symposium: PREHISTORIC LONG-DISTANCE INTERACTION IN OCEANIA**

The colonization strategies employed during settlement and subsequent diversification of island societies are key issues in Oceanic archaeology. Since isolation is a fundamental condition fostering divergence, understanding how relative extremes of isolation have influenced the evolution of human diversity in the Pacific becomes an important problem that must be examined for each island sequence. This symposium presents case studies from throughout Oceania that identify primarily exotic fine-grained basalt and volcanic glass artifacts by geochemical techniques, a pursuit only recently applied on a regional scale. Theoretical issues are addressed for explaining the role of continued interisland interaction in sociopolitical change.

**[8] Symposium: POSTCLASSIC XALTOCAN: ECOLOGICAL AND SOCIAL DETERMINANTS OF PRODUCTION IN THE NORTHERN BASIN OF MEXICO**

Three seasons of survey and excavation at Xaltocan, Mexico, have defined the resources available to the occupants of the site, A.D. 800-1500. This fieldwork has also yielded evidence that resource utilization was

shaped by the changing socio-political relationships between Xaltocan and other communities. Relationships such as exchange, alliance, domination of other settlements and subordination to outside rulers affected both extractive industries such as agriculture and fish processing and craft industries such as pottery manufacture and obsidian working. Thus, social relations mediate between humans and their environment to produce what might be seen as gains in systemic efficiency or exploitation of large segments of the population.

**[11] Symposium: THE SOCIOPOLITICAL ORGANIZATION OF HUNTER-GATHERERS IN CALIFORNIA: A CONSIDERATION OF NATIVE AND EUROPEAN ENCOUNTERS**

This symposium examines the sociopolitical organizations of native peoples who were responding to the colonial practices of Spanish missionaries, Russian fur traders, and Euro-American ranchers in California. Symposium papers consider how native polities underwent change using archaeological, ethnohistorical, and ethnographic sources. Observations are made on the spatial distribution, hierarchical elaboration, and population of native societies in northern, central, and southern California. Some participants also address the relevance of using ethnographic models to understand the sociopolitical organizations of prehistoric and protohistoric hunter-gatherer societies in California.

**[12] Symposium: THE SOCIAL AND POLITICAL CONTEXTS OF CRAFT TECHNOLOGY**

The papers in this symposium explore the dynamic interaction between social and political milieu and craft technology. In our papers, we consider technology beyond the scope of environmental and economic adaptation. Themes include the ideological contexts of technological innovation and elaboration; technology as it intersects with household, community, state, gender, and class; conditions facilitating control of technology for political and social ends; and the social and political settings which support particular technologies and the characteristics—such as labor intensity and standardization—they impart to finished goods.

**[13] Sponsored Forum: DARE TO DOMINATE A DOMINEERING DISSERTATION (SAA Student Affairs Committee)**

The SAA Student Committee presents a sponsored forum on the dissertation process. There will be short (5 minute) presentations by the speakers followed by a question and answer session. Topics will include resources available to graduate students, the SAA dissertation prize, dealing with committees, publication options, motivation, etc. All participants are also asked to think about issues of age, gender, race, sexual orientation, etc. in reference to the dissertation process.

**[14] Symposium: BEYOND STATE COLLAPSE: CASE STUDIES IN THE AMERICAS**

The aftermath of state collapse is an issue that lies at the heart of understanding cultural evolution in the Americas. Each of the papers in the symposium examines the issue of state collapse and subsequent cultural adaptation from the standpoint that the process, in and of itself, is nearly always incomplete, and a matter that is quite complex. Each of the case studies presents data for a given region, and an evaluation of the processes (historical, social, and cultural) that were underway in the restructuring of society just centuries before the Spanish arrival.

**[16] Symposium: LITHIC RAW MATERIAL ECONOMY IN LATE GLACIAL AND EARLY POSTGLACIAL WESTERN EUROPE**

Regional patterns in the use of lithic raw materials from different sources provide information on hunter-gatherer mobility, territorial organization, and exchange. New theoretical perspectives on technological systems call for a critical examination of arguments linking patterns in raw material use with aspects of hunter-gatherer behavior. This session brings together scholars working in several different regions of western Europe to present comparative data and evaluate theoretical approaches to lithic raw material economy among Late Glacial and Early Postglacial hunter-gatherers. Case studies focus on the scheduling and organization of raw material procurement for tool production. Discussions should provide insight into common processes as well as regional diversity in Late Glacial and Early Postglacial Europe.

**[18] Poster Symposium: THE ARCHAEOLOGY OF WEST POINT, SEATTLE, WASHINGTON: 4,500 YEARS OF LAND USE IN SOUTHERN PUGET SOUND**

The West Point archaeological site complex is within the boundaries of a sewage treatment plant in Seattle's Discovery Park. Shell midden and other cultural deposits were discovered initially in February, 1992 during construction of new treatment facilities. Over 60 radiocarbon dates from almost 2 years of field work document land use beginning ca. 4500 B.P. and continuing to 200 B.P. A project overview provides background for summaries of land use chronology, subsistence patterns, and lithic organization. Research results are compared to ethnographic and archaeological data from southern Puget Sound to broaden interpretations.

**[21] Workshop: EXHIBIT DEVELOPMENT FOR ARCHAEOLOGISTS—A WORKSHOP ON EVALUATION, DESIGN, AND INSTALLATION (SAA Public Education Committee)**

This three session workshop will focus on tailoring exhibits to a specific audience or the general public. Each session is independent of the others and may be attended individually. Session I is Evaluation: Front

End, Formative and Field Testing, Session II is Aesthetics and Mechanics of Signage and Installation. Session III is Participatory Exhibits.

**[22] Symposium: BIOARCHAEOLOGY OF THE CHINCHORRO PEOPLE**

Although a nonranked society, the Chinchorro Culture from South America practiced sophisticated techniques of artificial mummification beginning 8,000 years ago. The complexity of Chinchorro's socio-religious development is intriguing and has not been systematically addressed. An interdisciplinary group of archaeologists, paleopathologists and physical anthropologists will present their findings on settlement patterns, social organization, mummification techniques, health, and diet. This will be the first symposium dedicated to Chinchorro mortuary complexity.

**[23] Symposium: SURFACE ARCHAEOLOGICAL DATA AND THEIR INFERENCE POTENTIAL**

Until the 1970's, surface archaeological data generally were considered, with a few notable exceptions, substantively inferior to excavation data. Since the 1970s, surface archaeological data have been used principally, but not exclusively, to characterize aspects of the regional archaeological record and to guide the location of excavation units. Participants in this symposium demonstrate that the inferential potential of the archaeological record can be expanded considerably—contributing to the development of theory and method as well as to models of prehistory—when surface data are considered essential, unsullied elements of archaeological research.

**[24] Symposium: THE DYNAMICS OF CULTURAL DEVELOPMENT IN EASTERN ANATOLIA: INTER-REGIONAL RELATIONS AND SECONDARY STATE FORMATION**

Eastern Anatolia is geographically and culturally integral to any consideration of the dynamics of culture change in southwestern Asia. However, until recently, only minimal data relating to inter-regional exchange and secondary state formation have been available from this critical region. Recent and current surveys and excavations in eastern Anatolia are beginning to fill this gap in our data. The papers in this session examine the impact of the new Anatolian data on our understanding of inter-regional exchange and secondary state development in southwestern Asia during the 4th-1st millennia B.C.

**[25] Sponsored Symposium: METHOD AND THEORY IN PHYTOLITH ANALYSIS (Society for Phytolith Research)**

While phytolith analysis has become a standard tool in archaeology, identification and interpretation remain challenging. We begin this interdisciplinary session with advanced methods in microscopy (illustrated with a videotape of 3-D images of phytoliths) and statistics. We then discuss the identification of crops, of plant ecofacts, and of human impacts on the landscape; the formation of environmental and cultural deposits, including residues on stone tools and pottery and the remains of fibers; and the combination of phytoliths with other paleoethnobotanical data. The final paper summarizes issues raised by previous ones and encourages thorough reporting for continued growth of the field.

**[26] Symposium: ASSESSING THE IMPLICATIONS OF PLATFORM MOUNDS FROM THE PERSPECTIVE OF SEVEN CASE STUDIES**

The recent dramatic increase in knowledge of Southwestern platform mounds has given researchers a greater appreciation for differences in mound function. This symposium presents a series of case studies where the functional assessment of a platform mound also is a study of complexity that entails measurement of changes in social organization. Questions of the existence of elites or complexity without elites are addressed through an evaluation of evidence for (1) differentiation of occupants of platform mounds and (2) indications of integration through orchestrated consumption and storage activity for each case study.

**[27] Symposium: EVOLUTIONARY THEORY IN ANGLO/AMERICAN ARCHAEOLOGY**

This symposium focuses on the archaeological application of concepts drawn from macroevolutionary theory, and reflects a renewed interest among archaeologists in general theory of culture change. We suggest that Anglo-American archaeology has long operated under a general theory of culture change that is broadly analogous to Neo-Darwinian evolutionary theory. This paradigm is seldom made explicit, however, because of the history of the discipline and the lack of in-depth understanding of biological evolution on the part of many archaeologists. The papers presented range from broadly conceptual to substantive, and encompass a considerable geographical and temporal span.

**[28] Sponsored Forum: PROTECTING THE ARCHAEOLOGICAL RESOURCES OF THE HEMISPHERE (SAA Task Force on Latin America and National Park Service)**

This forum brings together diverse perspectives on archaeological resource protection from different countries throughout North and South America. Participants will briefly discuss the views developed from their own experiences of the major threats to archaeological resources, of the public perceptions of the value of archaeological resources, of the legal recourse for protection, and of the particular successes and

failures of efforts to protect archaeological resources. Presentations will be followed by discussion including the participants and the audience.

**[29] Symposium: THE MAYA LOWLANDS: PAN-MESOAMERICAN CONTACTS IN THE POST-TEOTIHUACAN ERA**

Focused on the Maya lowlands, this symposium features recent work by American and Mexican archaeologists that integrates new data into the macroscale framework of World Systems Theory. The empirical focus of this session is the changing panorama of the Mesoamerican world from the decline of Teotihuacan through the early Colonial period. Investigations at the pan-Mesoamerican scale are an important step for research in the Maya lowlands, since they broaden our understanding beyond the traditional site-specific focus that has long predominated in the area, and add a new perspective that complements the recent trend towards regional studies.

**[32] Symposium: NEW INSIGHTS INTO SOCIAL COMPLEXITY IN LOWER CENTRAL AMERICA: THE RIVAS SITE AND ITS NEIGHBORS**

Recent research in Lower Central America indicates greater socio-political complexity for some regions in later prehistory (ca. A.D. 1000-1500) than previously known. Investigations of art, subsistence economies, settlement patterns, and long distance exchange that include new theoretical and methodological approaches for many areas of the region have contributed to these new views. This symposium will highlight such research. Special attention will be given to the Rivas Site, Costa Rica, where the discovery of monumental architecture and evidence for extensive long distance exchange exemplifies general trends in the greater region.

**[33] Symposium: THE SOCIO-ECONOMIC DIMENSIONS OF PROCESSING IMPLEMENTS AND GROUND TOOLS: A SYMPOSIUM IN HONOR OF RICHARD B. WOODBURY**

Richard B. Woodbury is a pioneer in the archaeological interpretation of "ground stone" tools of the prehistoric Southwest. Building on this foundation of earlier work, this symposium refocuses ground stone analysis from description to explanation. Except for agricultural dependence, ground stone assemblages have long been overlooked as indicators of wide-scale socio-economic patterns. Recent work demonstrates that these artifacts may be used to make broader inferences about regional dynamics, including social organization, gender relations, and the organization of technology. By including several temporal, geographical, and cultural settings, these papers demonstrate the possibilities for archaeological interpretation based on the importance of these tools in the culture within which they functioned.

**[34] Symposium: PREHISTORY'S CHILDREN AND CHILDREN'S PREHISTORIES**

Children are generally neglected in the archaeological literature, yet they are significant producers and consumers of prehistory. This symposium addresses the roles of children as either agents or audiences. Some papers consider the ways in which children of the past can be made visible in the archaeological record. Other contributions examine non-archaeological realms (e.g., fiction, primate research) as vehicles for imagining the roles of children in the past. Finally, some papers deal with children as consumers of prehistory by discussing how the past is presented to children in different media.

**[38] Sponsored Forum: PRINCIPLES OF ARCHAEOLOGICAL ETHICS (SAA Committee on Ethics in Archaeology)**

The Ethics of Archaeology Committee was formed in 1991 to review and update the ethics policy of the Society for American Archaeology. The Committee is dedicated to a process of open discussion that will encourage wide participation. To facilitate discussion and policy development, the Committee obtained grants from the National Park Service and the National Science Foundation to sponsor a workshop at the Cultural Resource Management Policy Institute, University of Nevada-Reno. Eighteen participants representing a wide range of different backgrounds and viewpoints, attended the three-day event in November, 1993. During highly productive discussions, the participants developed a series of principles identifying the stewardship responsibilities of archaeologists. These principles are described in position papers. The session will include comments from four discussants, and invite questions/comments from the membership.

**[39] Plenary Symposium: THE ARCHAEOLOGY OF GLOBAL CHANGE**

For decades archaeologists have devoted considerable effort to exploring the nature of human interaction with diverse environments. Yet, most archaeologists have neglected to consider their work within the context of contemporary concerns about deterioration of the global environment. This has contributed to poor interdisciplinary communication and a tendency to minimize the relevance of long-term human impact on the environment in the broader arena of biodiversity studies. In the plenary symposium participants consider the human role in ecosystem change in different regions and the position archaeologists should play in the scientific agendas relating to biodiversity and global change.

**[40] Symposium: VISUALIZATION IN ARCHAEOLOGY: THE ROLE OF IMAGERY IN INTERPRETING PAST LIFEWAYS**

In recent years there has been an explosion of interest in the different ways in which archaeological knowledge is produced and communicated. One area that has been relatively neglected is the way in which archaeologists use visual images to present their ideas and arguments. This session will bring together a range of approaches that examine how our discipline has utilized visual forms of communication. The subjects being addressed include human evolution, the iconography of indigenous peoples and how that has shaped archaeological illustrations and interpretations, paleolithic archaeology and the archaeology of architecture.

**[41] Symposium: PREHISTORIC UNDERWATER ARCHAEOLOGICAL RESOURCES OF THE NORTH AMERICAN CONTINENTAL SHELF AND NEAR-COASTAL WATERWAYS**

Archaeological sites on the continental shelf of North America are critical to better understanding late Pleistocene and early Holocene populations. Without better representation of currently inundated coastal sites dating to these periods, important questions such as the distribution of Pleistocene and early Holocene peoples, use of marine resources by coastal groups, and changes in coastal resource-related technologies will remain unanswered. This symposium brings together site information on inundated land sites from coastal Florida, British Columbia, and abroad, beginning with a review of current sea level data and presentations on processes that contribute to the formation of currently inundated sites. Proposals will be made for increasing communication among the limited number of prehistoric, underwater archaeologists on a world-wide scale to improve information sharing, awareness of common problems, and potential avenues of research.

**[42] Symposium: ANTHROPOLOGICAL INTERPRETATIONS FROM ARCHAEOLOGICAL CERAMIC STUDIES: CASE STUDIES IN PREHISTORIC SOCIAL ORGANIZATION IN THE AMERICAN SOUTHWEST**

Even though ceramic analysis has been *de rigueur* in the American Southwest for decades, many studies are now going well beyond the level of classification or provenience determination. Several ongoing projects have made significant interpretive steps by examining issues of prehistoric social organization using ceramic evidence. Case studies from central Arizona and the Colorado Plateau are presented that focus on prehistoric social relationships in adjacent regions during times of population movement and aggregation (A.D. 1100-1400). This group of studies has achieved these results because each has established a substantial database and has integrated data from a suite of complementary research methods.

**[45] Sponsored Symposium: THE ARCHAEOLOGY OF THE PLEISTOCENE-HOLOCENE TRANSITION IN AFRICA, THE NEAR EAST AND EUROPE (International Quaternary Union-INQUA)**

This symposium will explore the diversity of human responses to the environmental changes between 13-8 ka B.P., that constituted the Pleistocene-Holocene transition, particularly regarding subsistence strategies. Hominids in Africa, Near East and Europe had adapted to glacial/interglacial transitions before the Oxygen Isotope Stage 2-1 boundary, but never before had they been: 1) of modern anatomy; 2) living in the complete range of biotopes, at often relatively high population levels; and 3) endowed with complex technologies. Sweeping fluctuations in the physical landscape and in food resources led to a wide variety of human reactions. These will be compared on a continental scale, to try to understand causes and consequences, including the variable rates and times at which food production was adopted in different regions.

**[46] Invited Symposium: PREHISTORIC HUMAN IMPACTS ON THE ENVIRONMENT: A GLOBAL PERSPECTIVE**

Human cultures at different levels of technological and societal development in prehistory had substantial impacts on their environments resulting in deforestation, loss of habitat, resource depletion, extinctions of flora and fauna, and adaptational responses to these anthropogenic environmental changes. By contrast, conservationists and ecological scientists often consider the "natural environment" as pristine prior to modern degradation and ignore these past impacts. Three issues from various regions of the world are examined by interdisciplinary researchers in this symposium: 1) short-term effects and long-term consequences of human-induced prehistoric impacts on the environment; 2) patterns that can be evaluated from one region to another; and 3) lessons from the past that can be applied to the present and future.

**[47] Symposium: TOWARDS VILLAGE LIFE: AFFLUENT FORAGERS**

The most significant transition in the history of human culture was the shift from mobile settlements to sedentary villages. This transition is often seen among hunters-gatherers in the development of complex political forms and it is accompanied by a shift from kin-based settlements to multi-kingdom amalgamations and coalitions. It further witnesses economic shifts such as the intensification of fishing and sea mammal hunting on the coasts of North America, Peru, and Northern Europe or the intensification of gathering as seen in the western Great Basin and the Near East. Through an intercontinental and interdisciplinary focus,



this symposium seeks an understanding of the social, political, demographic, and environmental conditions under which sedentary hunter-gatherer villages arose.

**[49] Symposium: ALBERT SPAULDING AND THE CONTINUATION OF ARCHAEOLOGICAL SCIENCE**

This symposium brings together a group of archaeologists who have been directly or indirectly influenced by the late Albert Spaulding. The symposium is not intended to be a retrospective of Spaulding's work. Rather it is intended to reflect the ways in which Albert Spaulding's multifaceted writings and ideas continue to influence current research practices, both theoretical and methodological. The current research of a number of archaeologists will be used to highlight the ways in which Spaulding's notion of archaeological science continues to shape our discipline.

**[52] Sponsored Symposium: MAKING THE GRADE: EVALUATING ARCHAEOLOGY EDUCATION PROGRAMS (SAA Public Education Committee)**

Twenty years ago there were only a handful of programs in North America which seriously attempted to educate the public about archaeology. Today, programs exist or are being developed in almost every state and province to educate both students and teachers about archaeological resources and their stewardship. Archaeologists and educators are beginning to recognize archaeology as a valuable tool for teaching in many disciplines and learning situations. Evaluation of these programs is critical to their improvement as well as to the development of new ones. In this symposium, we will describe some existing programs and their evaluation mechanisms, and share what has been learned about what works and what doesn't in a variety of educational settings.

**[53] Workshop: ARCHAEOLOGY FOR EDUCATORS, PART I (SAA Public Education Committee)**

Archaeology education has become an important part of the archaeological profession. This 10-hour workshop for all educators including teachers, museum docents, and outdoor program leaders, is a showcase of existing archaeology education programs. Participants discover the science of archaeology through hands-on activities. They are then equipped to teach archaeological concepts to both children and adults in a variety of settings. Exercises in values identification and clarification surrounding the issues of archaeological conservation and an overview of local resources complete workshop instruction. Although the workshop is designed for educators, archaeologists are invited to attend.

**[54] Fryxell Symposium: BONE CHEMISTRY AND HUMAN DIET—RECENT ADVANCES, RECENT RETREATS**

Spanning the disciplines biochemistry, geochemistry, physiology, and anthropology, the study of chemical signatures in living and fossil tissues has revolutionized the study of past human diets. The field of archaeological bone chemistry is barely twenty years old, yet it has already passed from a rarely available exotic procedure to a standard component of archaeological analysis. In the process, the field of osteochemistry has matured. Papers in the symposium explore the wide range of stable isotope and trace element studies in practice today and illustrate the broad geographical range of applications.

**[55] Symposium: THE FOUNDATIONS OF POWER IN PREHISPANIC OAXACA: ICONOGRAPHY, EPIGRAPHY, AND IDEOLOGY**

This symposium brings together a diverse group of scholars to consider the role of ideology in complex societies of prehispanic Oaxaca, from the Formative to the Postclassic. The papers describe aspects of prehispanic ideology and examine the role of ideology in the legitimization of power and strategies of rulership. The goal of the symposium is to encourage a dialogue amongst scholars working in archaeology, art history, ethnohistory, ethnography, and epigraphy. The symposium promises to achieve both a synthesis of current research as well as a discussion of theoretical implications, data limitations, and future directions.

**[56] Sponsored Symposium: THE ARCHAEOLOGY OF THE PLEISTOCENE-HOLOCENE TRANSITION IN ASIA, AUSTRALIA, AND THE AMERICAS (International Quaternary Union-INQUA)**

This symposium explores the diversity of human responses to environmental changes at the end of the Last Glacial in East Asia, Australia, and the Americas. Between 13,000 and 8,000 years ago, human adaptations in these regions were dynamic and diverse. In areas as diverse as Tasmania, Thailand, Japan, Siberia, the Plains, and Patagonia, humans had to adjust to major changes in climate, landforms, plant communities, and resources. Our papers provide regional syntheses of these adaptive patterns and discuss future research directions on the dramatic environmental and cultural changes that took place at the Pleistocene-Holocene transition.

**[57] Symposium: RECENT ADVANCES IN THE ARCHAEOLOGY OF BAJA CALIFORNIA**

This symposium presents the results of the most recent archaeological fieldwork carried out on the peninsula of Baja California. Archaeologically, Baja California remains one of the least studied regions in

North America. This is unfortunate in that its geographic isolation resulted in several unique cultural developments among the prehistoric groups that inhabited the peninsula. It thus provides a fascinating case for addressing the effects of cultural isolation. The symposium papers present data (including the latest radiocarbon dates for the peninsula) on many aspects of Baja prehistory including reports on the special project of the Instituto Nacional de Antropología e Historia in the Sierra de San Francisco, the largest ever undertaken in Baja California.

**[58] Symposium: BIG CHANGE IN BIG SITES ON THE BIG RIVER: REGIONAL VARIABILITY IN CLASSIC AND PROTOHISTORIC SITES OF THE NORTHERN RIO GRANDE, NEW MEXICO**

The Classic (A.D. 1325-1600) and Protohistoric (A.D. 1450-1700) periods of the Northern Rio Grande archaeological sequence in New Mexico are characterized by extensive site complexes and distinctive ceramic assemblages. Papers in this symposium present results of recent research examining variability in site use, economic strategies, and demography. Alternative models examining intra-site settlement patterns, site dating criteria, resource exploitation and regional integration move beyond typological categorization and ethnographic analogues that have been used to explain the economy, demographic change and the structure of late prehistoric and protohistoric society.

**[59] Symposium: AGRICULTURE AND THE FORMATION OF SEDENTARY COMMUNITIES**

The role of agriculture in the formation of sedentary communities has been postulated for some time. Sedentism in an agricultural economy requires certain facilities and behaviors oriented toward harvesting seasonally distributed, storable foods. These structural and economic shifts are often accompanied by a number of significant human behavioral changes including hereditary social inequality, social stratification, craft specialization, storage, ceramic production, irrigation, and warfare. It is also seen as a deleterious transition because of increases in population size, demographic change, increasing evidence for infectious disease, increased levels of violent conflict, and a decrease in the quality of the diet. This transition from mobile foragers to sedentary farmers is documented in a number of areas including Asia, southern Europe, the mid-latitudes North America, the lowlands of Central and South America, and the highlands of Mexico and the Andes.

**[62] Symposium: THE ARCHAEOLOGY OF THE MODERN STATE**

This session examines the archaeology of a series of institutions which define the modern capitalist state. European colonial and post-colonial institutions such as prisons, factories, and plantations structure and circulate state authority through the surveillance of individuals. Such institutions produced, circulated, and reproduced social behaviors which maintained state power relations. Each paper will demonstrate how apparently dissimilar institutions and mechanisms create and reproduce capitalist state societies.

**[64] Symposium: THE ARCHAEOLOGY OF MIGRATION IN EARLY EUROPE**

Recently many archaeologists have attempted to explain change in terms of internal societal dynamics rather than through movements of peoples. Papers in this symposium examine cases in European archaeology in which migration may have played an important role in cultural change. Examples from early historical contexts can contribute toward the development of method and theory in the archaeological study of migration.

**[65] Symposium: MICKEY MOUSE ARCHAEOLOGY: MICE, RATS, AND OTHER RODENTS**

Honoring the venue of the 1994 SAA Annual Meeting, this symposium deals with a gnawing problem in American archaeology: rodents. These small mammals are an under-considered but nearly ubiquitous feature of the zooarchaeological record. The papers in this symposium consider various aspects of rodent research, from ethnography and ethnohistory to quantitative zooarchaeology.

**[66] Symposium: PALEOINDIAN AND ARCHAIC ADAPTATION IN TRANSITIONAL ENVIRONMENTS**

Paleoindian and Archaic period occupation of the western plains and Rocky Mountain region of Colorado and Wyoming encompass a variety of subsistence and social adaptations at the juncture of two major environmental zones. This symposium will investigate and synthesize current studies in this area to better understand the relationship between peoples in these areas and their social and ecological environment. Of special interest is resource procurement, mobility across and within physiographic zones, and local adaptation to high altitude and transitional environments.

**[67] Symposium: ARCHAEOLOGICAL APPROACHES TO THE BUILT ENVIRONMENT**

Archaeologists have excavated and mapped thousands of buildings and built spaces, yet only use a handful of methods for analyzing the culturally constructed built environment. This is a major analytical oversight with significant theoretical implications for understanding past societies. This symposium brings together archaeologists and architects who are developing new approaches to the built environment, including phenomenological and structuralist approaches, the ethnohistory of spatial relations, and applications of

computer imaging and virtual reality. The archaeological case studies are global in scope: the Mediterranean, Nile Valley, Madagascar, Andean South America, Central Mexico, and lowland Mesoamerica. This symposium represents an important step in advancing archaeological research in the built environment.

**[68] Sponsored Symposium: ZINj KIDS AND ARCHAEOLOGY: PERSPECTIVES OF A YOUNGER GENERATION (ZINj Magazine and SAA Public Education Committee)**

Kids all over the world are interested in prehistory; numerous science fair projects, reports, class projects, and much personal time are devoted to archaeological topics, yet professional archaeologists are often unaware of that interest and, especially, are often unaware of the potential allies we have in the classrooms of America. In this symposium kids present the results of their experiments, research, thinking, and feelings about archaeology. Each presenter has worked with an adult, professional mentor, to produce a quality presentation. This symposium demonstrates that outreach to kids is an effective means to bring messages about protection and preservation of cultural resources to the general public, that kids are great spokespersons for heritage resources, that kids can be effective in educating adults, and that youthful enthusiasm is contagious.

**[69] Symposium: LATE PLEISTOCENE FORAGERS IN THE UKRAINE: RESEARCH AT MEZHIRICH, 1991-1994**

Multidisciplinary research involving scholars from Ukraine, Russia, and the United States has provided valuable new insights into Late Pleistocene adaptations on the East European Plain and has also yielded pertinent data on the macro- and micro-environments in which these adaptations occurred. Using a highly syncretistic battery of data recovery, data processing, and analytical methods and techniques, issues of Late Pleistocene site formation and emplacement processes, site use, subsistence, and seasonality are explored at Mezhirich, located at the junction of the Ros and Rosava rivers in south-central Ukraine.

**[74] Symposium: A ROCKY PAST: INTERDISCIPLINARY PALEOINDIAN RESEARCH**

From the beginning, Paleoindian research has been an interdisciplinary endeavor. The combined efforts of archaeology and geology, especially petrology and sedimentology, were crucial to early investigators in demonstrating the origins and antiquity of Paleoindian cultural deposits. More recently, Paleoindian specialists have employed additional techniques and concepts from other scientific disciplines including chemistry, ecology, mathematics, physics, and zoology. The papers in this symposium exemplify the growth and necessity of interdisciplinary Paleoindian research.

**[75] Symposium: RECENT RESEARCH IN SOUTHERN NEVADA**

This symposium emphasizes recent archaeological research on the prehistory and history of southern Nevada, a region which encompasses the periphery of the Southwest, the Mojave Desert, and the Great Basin. The diversity of the papers reflects the complexity of the research issues in the region. They focus on prehistoric climate reconstruction, chronology, water resources, infra-structure of hunter-gatherer sites, geoglyph analysis, historic site interpretations, and recent historic structures in an archaeological context. Together these papers represent the state of current research on important themes in western United States archaeology.

**[77] Symposium: BETWEEN HORIZONS: SOCIAL RECONFIGURATIONS AND POLITICAL STRATEGIES IN THE EARLY INTERMEDIATE PERIOD OF PERU**

Striking changes in social structure, economic, political, and ideological organization, and settlement and burial patterns occurred in the Central Andes at the close of the Early Horizon with the demise of the integrative networks fostered by the Chavin cult, and again at the end of the Early Intermediate Period as Andean societies entered into significant interaction around the new, more politically based integration of the Wari Empire. We examine the critical events and processes of deconstruction and reconfiguration at the beginning and end of the Early Intermediate Period from the perspective of the north coast and adjacent highlands with comparative insights provided by discussions for other core regions of the Central Andes.

**[79] Symposium: ISLANDS AS LABORATORIES: ARCHAEOLOGICAL RESEARCH IN COMPARATIVE PERSPECTIVE**

In this symposium researchers examine the utility of the biogeographic concept of "islands as laboratories." Islands have served as convenient units for biologists and anthropologists to address questions of evolutionary change because they vary in size, ecological complexity, human and environmental history, and degree of relative isolation. Recent island research has stressed two related issues. Paleoenvironmental analyses demonstrate the fragility of island environments with natural and human-induced changes. Recent work has also shown that islands are not "closed systems" but vary significantly in inter-island and island-mainland interactions (human and biotic). We show that island laboratories offer insights for research problems worldwide.

**[80] Symposium: THE HOHOKAM CLASSIC TO POST-CLASSIC TRANSITION: CULTURAL CONTINUITY OR DISLOCATION?**

Across the American Southwest during the late A.D. 1300s, populations decline and many regions are apparently abandoned. In the Hohokam Region, accumulating evidence indicates the presence of low density populations after about A.D. 1350. Papers presented here focus on the cause of this population decrease, as well as differences and similarities between Classic and Post-Classic period cultural adaptations. To what extent are Post-Classic populations comparable to the Classic period? The problem of determining the degree of cultural continuity and/or change is addressed from site-specific perspectives and through analysis of specific classes of material culture.

**[81] Symposium: IT'S A SMALL WORLD AFTER ALL: THE STUDY OF COMMUNITIES AND THEIR ORGANIZATION**

The focus of this symposium is on communities and their organization. All human societies occupy communities. Depending on such factors as sociocultural complexity, subsistence, social organization, and intergroup relations communities range from relatively self-sufficient entities to elements or modules linked into highly integrated networks of other communities. Further, the internal organization of communities reflects an additional set of factors and constraints associated with kinship relations, activity organization, wealth and status, ideology, and cosmology and ritual. Sorting out these factors, at the local and regional scales, is a major methodological challenge. Linking the factors to community structure, organization, and change is the theoretical challenge. In this session, scholars investigate community organization from a variety of theoretical perspectives, methodological approaches, and regional contexts.

**[82] Sponsored Public Symposium: INVESTIGATING THE MYSTERIES OF TIME WITH ARCHAEOLOGY (SAA Public Education Committee)**

This three hour program offers a lecture series and exhibits/posters oriented to the general public in the Los Angeles vicinity. The lecture series includes a session chair, two featured speakers, a representative of the SAA, and a spokesperson from the Society for California Archaeology. The latter speaker briefly discusses opportunities in that state for the interested public to get involved in archaeology. The two featured speakers address in a popular fashion the wide range of scientific techniques that archaeologists use to reveal the ancient and recent past. The exhibits/posters represent a wide range of archaeological organizations from California and nationwide and provide information on current archaeological activities as well as programs available to the public.

**[83] Symposium: PREHISTORIC ENVIRONMENTS AND LAND USE ALONG A 1670 KM TRANSECT IN THE WESTERN UNITED STATES**

A five-year program of archaeological surveys, testing, data-recovery excavations, and monitoring of construction along the route of a natural gas pipeline in Idaho, Washington, Oregon, and California has been completed. Paleoenvironmental research and archaeological investigations at more than 400 prehistoric and historic sites along the 1670-km transect have yielded substantial information on latitudinal and diachronic variability in land use, settlement, resource procurement, subsistence, and exchange systems over a span of 10,000 years. The papers in this symposium examine the Project's major research goals, methods, and findings, not only as they relate to testing archaeological models and hypotheses but also in terms of designing future studies of land use along extensive transects.

**[84] Symposium: PROJECTILE TECHNOLOGIES: ARCHAEOLOGICAL, EXPERIMENTAL, AND ETHNOARCHAEOLOGICAL PERSPECTIVES**

Contributions to this symposium address questions concerning the design, manufacture, and use of projectile technologies, as well as environmental and cultural influences on weapon selection and projectile design. Paradigmatic issues of exploring projectile technologies and hunting techniques are considered. The temporal coverage of the symposium extends from the Middle Paleolithic through the present; geographic scope spans the Old World and the New World. Results of archaeological, experimental, and ethnoarchaeological research involving spears, atlatls, bows, and arrows are presented.

**[85] Symposium: THE DEVELOPMENT OF SOCIAL POWER IN NONSTATE SOCIETIES: EXAMPLES FROM THE AMERICAN SOUTHWEST AND THE SOUTH-CENTRAL ANDES**

The methodological and theoretical issues involved in the reconstruction and explanation of the development of social complexity in nonstate societies have generated considerable debate. Using case studies from the South Central Andes and the North American Southwest, this symposium will address the archaeological measurement and the explanation of a central aspect of complexity, i.e., social power, from a number of theoretical vantage points. These two regions were chosen because they developed significant levels of social complexity without becoming states, were frontiers of states during long periods of their histories, and were occupied by groups of similar demographic and territorial scales of integration.



**[86] Symposium: RECENT RESEARCH ALONG THE LOWER COLORADO RIVER**

The archaeology of the lower Colorado River region has not been studied as intensively as other regions of the American Southwest. Several recent surveys sponsored by the Bureau of Reclamation and undertaken by Statistical Research Inc. have provided opportunities for systematic study and have significantly increased our knowledge of the region. This symposium focuses on the results of these surveys, treating themes such as ceramic chronology, milling implement technology, ceremonial behavior, and federal land management concerns. In addition to the archaeological research, the significance of the cultural resources is presented from a Native American perspective.

**[87] Symposium: THE COLHA PRECERAMIC: NEW VIEWS ON LOWLAND MAYA ORIGINS**

Excavations at the site of Colha in northern Belize have produced new data on human occupation prior to the Maya early Middle Preclassic. Presently, the early Middle Preclassic represents the first evidence (ca. 800-1000 B.C.) of Maya culture in the Belize lowlands. However, our research, along with investigations in adjacent Cobweb Swamp, provide evidence of human activities between 1100-1300 B.C. and earlier. Pottery is absent, but there are distinctive stone tools, along with agriculture and landscape modification. This symposium examines these new data, with input from archaeology, geoarchaeology, palynology, and replicative and wear pattern studies.

**[88] Symposium: EXPANDING THE PALEOINDIAN UNIVERSE: NEW DATA FROM EASTERN NORTH AMERICA**

This symposium presents the results of recent site surveys and excavations conducted in the lower Great Lakes region. These investigations provide exciting new data on subsistence, land use, and raw material procurement strategies. These data were examined from a variety of site types including habitations, quarries and workshops, and large game kills. Cross-cultural comparisons are made between western and eastern artifact assemblages and their significance in the interpretation of Paleoindian economies.

**[90] Symposium: GREAT BASIN BIOARCHAEOLOGY: DESERT WETLANDS ADAPTATIONS**

Although there has been a long history of archaeological research in the Great Basin, few human remains have been documented. The recent recovery of three large skeletal series from the northern (Malheur Lake, Oregon), western (Stillwater Marsh, Nevada), and eastern (Great Salt Lake, Utah) Great Basin, permits for the first time a biocultural assessment of prehistoric peoples from these regions. Papers included in this symposium provide an archaeological background to each of the regions and utilize skeletal data to address the genetic history, diet, health, and activity patterns practiced by human populations in this area of the Desert West.

**[92] Symposium: THE LITTORAL TRUTH: RECENT ADVANCES IN METHOD AND THEORY IN NORTH AMERICAN COASTAL SITES RESEARCH**

Scholars from the Atlantic, Pacific and Gulf coasts have been assembled in this symposium to present innovative approaches to methodological and theoretical problems common to the study of prehistory on all coasts. Among the topics included: methods to identify and interpret discrete depositions within complex shell middens; determining seasonality through analysis of multiple species of fauna and shellfish, and stable oxygen isotope ratios in clams; new applications of geology and geomorphology to questions of emerging settlement systems; sea level rise, estuarine ecological modelling and human adaptations; radiocarbon dating as a creative survey tool; theoretical implications of early Holocene use of the coastal zone; and a new emphasis on coastal sites research in developing broad theory concerning human adaptation and culture change.

**[93] Symposium: ARCHAEOLOGY AS A COLONIAL ENDEAVOR**

In much of the world archaeology has been and remains a colonialist endeavor. This colonialism manifests itself in archaeologists studying the pasts of conquered peoples and in core state archaeologists dominating the archaeology of peripheral states. In these contexts the past often becomes a locus of struggle between colonialist and nationalistic interests. The papers in this session examine the practice of archaeology in such contexts. They ask how does the competition between different interests shape this practice and how do these conflicts affect the interpretations that archaeologists make about the past?

**[95] Invited Forum: NATIVE AMERICANS, ARCHAEOLOGISTS, AND SACRED PLACES**

Throughout the United States the protection of sacred places is a prominent issue for Native American people. This concern affects archaeologists in two ways. First, many locations that we view as archaeological sites are sacred places for Native Americans and our interests in doing research may put us in conflict with Indian people. Second, within most federal and state land management agencies compliance with the American Indian Religious Freedom Act has been delegated to archaeologists. This session will let archaeologists hear from Native American elders and tribal leaders what Native American concerns are about sacred places.

**[96] Symposium: CONSTRUCTING AND INTERPRETING VARIATION: TYPOLOGY AND ALTERNATIVES**

Archaeologists have always spent much of their time imposing order on the multiformity of material culture and the human past. They have used material culture to construct culture histories, to measure degrees of social interaction, to examine the role of information exchange and social messaging, and, most recently, to emphasize the importance of context. However, over the past ten years there has been little critical analysis of classification and the structuring of archaeological data. These papers present new and diverse perspectives on how archaeologists constitute their knowledge of, and then interpret, variation.

**[98] Symposium: GEOGRAPHIC APPROACHES TO THE STUDY OF PREHISTORIC AGGREGATION IN CENTRAL ARIZONA**

At the end of the 13th century A.D., small Salado compounds of four to twelve rooms in Tonto Basin, Central Arizona, were abandoned and populations aggregated into larger settlements. Several large sites with associated platform mounds begin to take on regional significance while other portions of the basin appear to be entirely abandoned. This multidisciplinary symposium studies the ecological conditions associated with this settlement shift from the perspectives of archaeological settlement patterns, exploitation of wild resources, demography, physical health and agricultural productivity.

**[99] Symposium: PREHISTORIC CULTURES AS COMPLEX ADAPTIVE SYSTEMS**

Researchers in the fields of evolutionary biology, economics, adaptive computation, physics, and (recently) anthropology, have modeled nonlinear systems as the complexly patterned consequences of the operation of simple self-organizing principles. These complex adaptive systems vary from stable, seemingly predictable (linear) states to near "chaotic" states because of the high degree of interconnectivity between the parameters that govern the system, small external stimuli, and historical idiosyncrasies. Participants in this symposium have found the complex adaptive systems paradigm to be useful for improving our understanding of prehistoric socio-cultural change.

**[100] Symposium: THE EVOLUTION OF SOCIAL COMPLEXITY IN POLYNESIA**

Polynesian societies provided a critical comparative basis in early studies of cultural evolution. Abandoning such typological schemes, recent research has focused on explaining why social complexity developed in its varied forms. Researchers in this symposium draw on advances in evolutionary theory and emphasize environmental and social factors in accounts of socio-political change in Polynesia.

**[101] Symposium: THE JOHN W. GRIFFIN MEMORIAL SYMPOSIUM: THE MISSIONS OF SPANISH FLORIDA**

Franciscan missions in Spanish Florida were located in three indigenous provinces: Guale, Timucua, and Apalachee. Between 1566 and 1704, the mission effort was at its greatest strength with over three dozen established missions. This symposium presents current interpretations of archaeological, bioanthropological, and archaeobotanical findings from long-term research conducted at several sites in each province.

**[103] Sponsored Symposium: ROCK ART: IMPLICATIONS FOR CULTURE HISTORY AND CULTURE PROCESS (ICOMOS, International Rock Art Committee)**

With an empirical foundation provided by a century of descriptive studies, rock art investigations are increasingly moving towards problem-oriented research. This developing trend, illustrated by papers in this session, is based partly on new techniques, such as direct chronometric dating, spatial statistics and biochemical assays, and partly on integrative approaches analyzing rock art in conjunction with iconographic, paleoethnobotanical, settlement pattern, ethnoarchaeological, and excavation data. These allow considerations of various historical and processual problems, including migration and mobility, cultural interaction, resource use, and political differentiation.

**[106] Symposium: RECENT STUDIES OF ANCIENT MAYA SKELETONS**

Analysis of Maya skeletal remains has evolved from simple case studies of age, sex, and pathology into population-based, statistically sophisticated paleodemographic and paleoepidemiologic studies. Data accumulated during the past 20 years from a variety of temporal, social and geographic contexts are being used to explore problems ranging from the causes of the Collapse to the effects of the Spanish Conquest. Researchers are employing new techniques and tools to reveal rich details about genetic relationships, cultural change, diet, and environmental change in the Maya area.



## PAPER AND POSTER ABSTRACTS

*Abad, C. Keabaunani (Hawai'i-Manoa)*

[100] THE EVOLUTIONARY IMPLICATIONS OF HAWAIIAN MONUMENTAL ARCHITECTURE  
SERIATIONS

Seriations of a class of Hawaiian monumental architecture (*beiau*) are shown to provide a useful data base for investigating the evolution of sociopolitical complexity in Polynesia. The results of seriations performed on *beiau* of Maui Island indicate that leeward and windward temporal patterns differ. Possible interpretations for this divergence are explored and evaluated. Included among these is that the leeward and windward regions may have developed as separate political entities in competition with one another.

*Abbott, D. (see Burton, J.)* [42]

*Abbott, David (Arizona State)*

[80] SOCIAL CHANGE AT PUEBLO GRANDE DURING THE CIVANO/POLVORÓN TRANSITION

This paper examines the decline in social complexity that occurred from the Civano to the Polvorón phase at Pueblo Grande, perhaps the largest Hohokam village in the Phoenix area. During the Civano phase, there were differences between residential groups as indicated by their differential participation in social networks and access to ceramics produced by specialists. By the Polvorón phase, the social network encompassed a substantially larger geographical area than previously, but without notable social differentials. The implications for the current conception of the Polvorón phase, the Hohokam abandonment of the Phoenix area, and the process of social decline in general are discussed.

*Adams, Brian (Illinois-Urbana/Champaign)*

[91] LITHIC RAW MATERIAL UTILIZATION AND THE TRANSITION FROM MIDDLE TO UPPER  
PALEOLITHIC IN NORTHEAST HUNGARY

The Bükk Mountains of northeast Hungary have produced several Middle and Early Upper Paleolithic assemblages. Several "transitional" assemblages have also been found here, now known as "Szeletian". The close proximity of several sites dating to the Middle, "transitional" and Early Upper Paleolithic in the geographically well-defined region of the Bükk Mountains permits a detailed investigation of human behavioral changes at this time. Results of recent analyses of lithic raw material acquisition and use during these periods are presented.

*Adams, E. Charles (Arizona State Museum) and William H. Walker (Arizona)*

[85] RITUAL AND SOCIAL POWER IN THE PUEBLO SOUTHWEST

Research in the U.S. Pueblo Southwest has identified ritual structures associated with settlements covering the last 1500 years. These ritual or "integrative" structures fluctuated in size, frequency, and formality in conjunction with changes in settlement size and complexity. Such elaboration of ritual structures suggests that ritual formed the basis of social power in the Southwest and that understanding the elaboration and formalization of ritual structures and associated ritual behavior may offer insights into changing power relations in the U.S. Pueblo Southwest.

*Adams, Jenny L. (Arizona)* [Discussant 33]

*Adams, Karen R. (Crow Canyon Archaeological Center), Joe D. Stewart (Lakehead), and Christopher D. Pierce (Crow Canyon Archaeological Center)*

[19] DETERMINING THE TAXONOMIC IDENTITY OF TREES AND SHRUBS PRESENT IN  
PREHISTORIC HEARTH ASH VIA ICP-AES ANALYSIS

Multi-element profiles obtained on modern tissue samples of potential prehistoric hearth fuels, and on archaeological samples of ash, charred wood and sediment from southwestern Colorado using ICP-AES (Inductively Coupled Plasma Atomic Emission Spectrometry) indicate the potential for identifying fuel taxa from chemical properties of ash. In this poster session, we present the results of our pilot study and evaluate sources of error and variation including intra-taxon variability, inter-taxon similarity, post-depositional alteration, and multi-taxon mixture problems.

*Adams, R. (See Murphy, L.)* [38]

*Addison, David (Hawai'i-Manoa)*

[100] PREHISTORIC MARQUESAN AGRICULTURE: INTERRELATIONSHIPS BETWEEN  
ENVIRONMENTAL VARIABLES, AGRICULTURAL PRODUCTION AND STORAGE  
TECHNIQUES, AND THE EVOLUTION OF SOCIAL COMPLEXITY

Contact period Marquesan society differed in significant ways from other Polynesian societies. The land tenure system was highly privatized; territoriality and aggression were pervasive; storage of fermented breadfruit (*Artocarpus altilis*) paste was an integral part of the subsistence system; prestige competition

Aimers, Jim J.

13

through feasting and megalithic dance platform construction required the expenditure of considerable resources; and chiefly power had largely been usurped by champion warriors and inspirational priests. The Marquesan environment is temporally highly variable. Prolonged droughts are common, unpredictable events. Interrelationships between this environment, the Marquesan agricultural production strategy, and the evolution of Marquesan society are explored.

*Addyman, Peter V. (York Archaeological Trust)*

[3] BRITISH ARCHAEOLOGY, 1944-2044: THE PAST AS A GUIDE TO THE FUTURE

1994 marks the 50th anniversary of the Council for British Archaeology. Many of the concerns of the Council's founding fathers foreshadowed developments in British Archaeology 1944-94.

This paper reviews current concerns in British archaeology and looks at processes now in progress. It uses these as predictors of the shape and role of archaeology in Britain in A.D. 2044 when the Council will reach its centenary. Both the present state of British archaeology and its likely future provide interesting contrasts with U.S. archaeology.

*Adler, M. (see Kultsbeck, J.)* [58]

*Adler, Michael (Southern Methodist University)*

[59] VILLAGE FORMATION AND COMMUNITY ORGANIZATION AMONG THE ANASAZI OF THE  
AMERICAN SOUTHWEST

Archaeologically, village formation results from the relocation of smaller, previously dispersed residential units into a larger, spatially defined settlement. Community organization is the modern interpretation of the social relationships that integrated and differentiated multiple prehistoric residential units. While community organization does not necessitate spatial aggregation of residential units, it does require the aggregation of shared rights and responsibilities among a defined group of people. This paper assesses archaeological models of the episodic creation and disintegration of villages in selected areas of the northern Southwest between A.D. 800-1400. Models of village formation are assessed both for their "fit" to the data and their utility for understanding prehistoric community organization.

*Adovasio, J. (see Soffer, O.)* [69]

*Adovasio, J.M. (Mercyhurst College), Olga Soffer (Illinois), D.C. Dirkmaat (Mercyhurst College), C.L. Pedler (Mercyhurst College), and R. Buyce (Mercyhurst College)*

[69] PITS AND MIDDENS AT MEZHIRICH: THE THIRD INSTALLMENT

Mezhirich is the first Upper Paleolithic site in the former Soviet Union to have been subjected to intensive flotation studies. Previous papers on the application of this technique have explored basic issues of preservation and differential recovery (1991) and have attempted to discern and define the character and composition of pit and midden fills at the site (1992). This paper presents the results of the 1993/1994 flotation studies and focuses on the micro-vegetal remains from the site in terms of subsistence, seasonality, and paleoenvironment. The differential recovery of vegetal remains from pits and middens is explained in terms of bioturbation and/or human selectivity.

*Afonso, J. (see McCutcheon, P.)* [19]

*Abler, Stanley (Northern Arizona University), Matthew J. Root (Washington State), Jerry D. William (Northern Arizona University), and Lisa K. Soltfrin (Northern Arizona University)*

[97] FOLSOM AND OTHER PALEOINDIAN CULTURAL ORGANIZATION AT THE KNIFE RIVER  
FLINT QUARRY AREA, NORTH DAKOTA.

Abundant new information about early Paleoindian cultural organization is available from two linked study sites at Lake Ilo within the Knife River flint (KRF) quarry area, North Dakota. Goshen-like points associated with quarry and camp remains confirm occupations predating Folsom. Main components consist of spatially segregated deposits of Folsom lithic workshop and camp debris. Reduction sequence data for non-local, non-KRF artifacts and production rate data for KRF support models favoring mobility over exchange in Folsom settlement dynamics. Folsom lithic production rate and reduction trajectory data contrast strongly with those for the Plano complex from the same region.

*Aikens, C. M. (see Akazawa, T.)* [56]

*Aimers, Jim J. (Tulane)*

[60] A REVISED INTERPRETATION OF THE MAYA E-GROUP

Maya E-groups are monumental architectural assemblages considered since the 1920s to have been used for solar observations of the solstices and equinoxes. However, morphological variability in the assemblages, solar observations at several sites, examination of associated artifact assemblages, and the nature of the burial remains do not support the observatory hypothesis. The evidence suggests that rather than timekeepers

in stone, the assemblages seem more likely to have been monumental settings for ritual, probably in relation to the agricultural cycle.

**Akazawa, Takeru (Tokyo University Museum) and C. Melvin Aikens (Oregon)**

**[56] PLEISTOCENE CONTINUITIES AND HOLOCENE DEVELOPMENTS IN EAST ASIA: SYSTEM INSTABILITY AND ADOPTION OF NEW STRATEGIES OF PREHISTORIC HUNTER-GATHERERS**

The Pleistocene to Holocene transition in East Asia (13-8 ka B.P.) is one in which climatic changes over time prompted a steady response of microlithic peoples in terms of large-scale migration patterns originating in population growth. Archaeological evidence exists in Asia that shows common microlithic industries. However, evidence also suggests that with the rise of ceramic industries, differences by region and a shift from a hunting-gathering mode of subsistence to a new economy. This marks a shift from a diet chiefly of animal proteins to one with a greater reliance on plant foods along with a more sedentary lifestyle.

**Albaitero, J. (see Uruñuela, G.) [30]**

**Albeck, Maria Ester (Instituto Interdisciplinario Tilcara, Argentina)**

**[85] SOCIAL POWER AND AGRICULTURAL MANAGEMENT: A CASE STUDY FROM NORTHWEST ARGENTINA**

The role of social power in agricultural production is a rather unexplored aspect of social complexity in Argentina. Intensive cultivation and a high population density with hierarchically organized settlements developed in prehispanic times in Quebrada de Humahuaca, an arid valley in Northwest Argentina. Agriculture was practiced in the valley bottom and in the higher piedmont areas. The agricultural sites in the piedmont cover extensive areas, show a great structural complexity, and lie several hours walk from the settlements in the valley bottom. The agricultural management (irrigation, cultivation, and storage) of these sites offer interesting possibilities for the study of social power in Quebrada de Humahuaca.

**Albright, T. (see Williams, R.) [55]**

**Alconini, S. (see J. Janusek) [43]**

**Alconini, Sonia (Universidad Mayor de San Andres)**

**[43] HISTORY AND RITUAL IN THE SACRED PYRAMID OF TIWANAKU: TRANSFORMATION IN TIWANAKU CEREMONIAL PRACTICE AS INFERRED FROM AKAPANA CERAMIC OFFERINGS**

Although the ritual importance of Tiwanaku has been long known, we lack a clear understanding of the forms of ceremony carried out in its monumental structures, or how ceremonial practice might have changed through time. This study, based on two years of ceramic analysis, evaluates patterns of standardization and variability in Akapana ritual offerings, and plots changes in such patterns throughout the history of the structure. Transformations in Akapana ritual practice are shown to have been tied to broader socio-political changes occurring in the urban center, and in the larger polity, through the IV and V periods (A.D. 400-1100).

**Aldenderfer, Mark (California-Santa Barbara)**

**[59] ON THE ORIGINS OF SETTLED VILLAGE LIFE IN THE ANDEAN WORLD**

Over the past 15 years, the origins of sedentary communities in the Andean world has become far better understood. This paper summarizes what is known of the trajectory of sedentarization and the origins of village life in three key regions of the Andes: the north coast of Peru, the highland valleys and basins of central and southern Peru, and the Titicaca basin.

**Alexander, Rani T. (Northern Illinois University)**

**[29] ARCHAEOLOGY ON THE COLONIAL FRONTIER: THE SPANISH WORLD SYSTEM AS VIEWED FROM ITS YUCATECAN PERIPHERY**

Yucatan may be characterized as a periphery of the Spanish World System from 1545 to 1821. Economic production, especially of cash crops, on the periphery is typically controlled by the core to ensure the flow of goods to the system center. Communities on the periphery, however, vary in their degree of integration with the core, which may produce variation in the archaeological record. Through the juxtaposition of historical and archaeological evidence, this paper examines the manipulation of a specific commodity, livestock, among Colonial period Yucatecan communities to suggest which archaeological variables might be sensitive to changes in world systems.

**Algaze, Guillermo (California-San Diego)**

**[24] EARLY BRONZE AGE STATE FORMATION IN SOUTHEASTERN ANATOLIA**

Much attention has been focused on the rise of pristine states in the alluvial lowlands of Mesopotamia. Comparatively less research, however, has been devoted to understanding the development of states in the plains of northern Syria and southeastern Anatolia, where indigenous states did not emerge until the mid-third millennium B.C. Until recently, pertinent data bearing on this emergence have been derived solely

from excavated sites in Syria. However, new excavations and surveys at Tiriş Höyük, in southeastern Turkey, are beginning to produce a coherent corpus of regional data that both complements and contrasts with the Syrian data.

**Allen, Jane (Bishop Museum)**

**[100] ORGANIZING THE LANDSCAPE: AGRICULTURE AND THE EMERGENCE OF THE PRE-CONTACT HAWAIIAN STATE**

Sociopolitical organization in Hawai'i reached the state level of complexity well before Contact in A.D. 1778. The Hawaiian state was agriculturally based, and developed largely out of structures used traditionally to coordinate resources across a heterogeneous and easily-damaged landscape. New evidence suggests that these structures were effective, controlling agricultural production, water distribution, and soil erosion, by A.D. 1400.

**Allen, Jim (La Trobe University)**

**[56] GREATER AUSTRALIA AT THE PLEISTOCENE-HOLOCENE TRANSITION**

While few changes are recognized in the archaeological sequences which span the period 13-8 ka B.P. on the Australian continent itself, the marine transgression which accompanied the Pleistocene-Holocene transition divided the single Pleistocene continent into Australia, New Guinea, and Tasmania. In New Guinea, this separation saw the appearance of horticulturalists. In Tasmania, humans colonized its periglacial uplands by 35 ka B.P. and maintained their use through the Last Glacial Maximum. About 12 ka B.P., however, all of these sites were abandoned and the southwest region remained unoccupied for all of the Holocene. This paper contrasts these extremely different responses.

**Allen, Mark W. (California-Los Angeles)**

**[36] PA AND POWER: CHIEFDOMS AND HILLFORTS IN HAWKE'S BAY, NEW ZEALAND**

This poster presents recent research on the formation of Maori chiefdoms. Prehistoric polities in Hawke's Bay, New Zealand are identified by traditional history as well as archaeological analysis on hillforts (pa). It is demonstrated that by 450 B.P., potential horticultural land and other economic resources were limited. The resultant need to organize and finance the protection of scarce resources, stored food supplies, and populations were key processes in the formation of polities. It afforded leaders the opportunity to achieve increased power and authority as the ability of chiefs to mobilize capital, labor, and social networks were critical for effective pa construction.

**Allen, Melinda (Bishop Museum) and Kevin Johnson (Bishop Museum)**

**[6] PATTERNS OF INTERACTION IN THE SOUTHERN COOK ISLANDS**

Recent research on Aitutaki and other islands in the southern Cook Islands indicate that despite significant inter-island distances, communication was maintained between island communities over roughly a five hundred year period (A.D. 1000 to 1500). Subsequently, interaction became less frequent and certain exotic materials are no longer widely distributed. This paper considers the extent, direction, and timing of this prehistoric interaction based on the distribution of two raw materials, pearl-shell (*Pinctada margaritifera*) and fine-grain basalts. Conditions fostering early interaction and subsequent changes in the frequency of interaction are also explored.

**Allison, M. (see Aufderbeide, A.) [22]**

**Allison, Marvin J. (Medical College of Virginia)**

**[22] PROBLEMS RELATED WITH PREGNANCY AND PARTURITION IN EARLY INHABITANTS OF PERU AND CHILE**

This is a review of our findings related with pregnancy in early female inhabitants of the Arica, Chile area. The unusual conditions of preservation enable us to visualize their problems directly and identify individuals pregnant or recently delivered at the time of death. Chemical analysis of their bones suggests that a rib/femur iron ratio would be useful to identify similar conditions in females from random skeletal material with no soft tissue.

**Altschul, J. (see Van West, C.) [98]**

**Altschul, Jeffrey (Statistical Research) and Joseph A. Ezzo (Statistical Research)**

**[86] THE EXPRESSION OF CEREMONIAL SPACE ALONG THE LOWER COLORADO RIVER**

Although Pilot Knob has been described as a site of the *keruk*, or mourning ceremony, no attempt has been made to correlate the archaeological record with the ceremony. In this study we seek to determine the ceremonial nature of Pilot Knob, Ripley, and Senator Wash through the integration of ethnographic and archaeological data. Material correlates of the *keruk*, such as anthropomorphic intaglios, symbols of sacred places, circular features, and rock art panels, arranged in particular spatial associations, are evident at Pilot Knob and Ripley. Senator Wash was a locus of ceremonial activity, but on a smaller, more localized scale.



*Ambrose, Stanley H. (Illinois), Brian M. Butler (Southern Illinois University-Carbondale), Douglas B. Hanson (Forsyth Dental Institute-Boston), Rosalind L. Hunter-Anderson (Micronesian Archaeological Research Services-Guam), and Harold W. Krueger (Geochron Laboratories-Cambridge)*

**[54] STABLE ISOTOPIC ANALYSIS OF HUMAN DIET VARIATION IN MICRONESIA**

Proportions of marine versus terrestrial resources in prehistoric human diets on Rota, Guam, and Saipan islands have been estimated with stable isotope ratios of carbon and nitrogen in bone collagen and carbon in apatite. On Rota, marine food consumption ranged from 25% to 55%; on Guam and Saipan, from 30-45% and 25-30%, respectively. Apatite carbon isotopes of Saipan humans suggest significant reliance on  $C_4$  plants, but none are known to be prehistoric staples. Low nitrogen isotope ratios confirm their predominately terrestrial plant diet. Local food resources are being analyzed to identify isotopically enriched plants.

*Ames, Kenneth M. (Portland State)*

**[47] THE EVOLUTIONARY SCALE OF HUNTER-GATHERER SEDENTISM**

Sedentism is widely regarded as one of the water-shed events in human history. Current explanations for its evolution among hunter-gatherers focus on the ecological costs and benefits of sedentism for local groups seen in isolation. While this approach may explain instances of short-term local sedentism, it cannot completely explain permanent shifts to sedentary settlement patterns. A successful shift in residential patterns to long-term sedentism (at least several generations) may require that the change occur over a large region, among a large number of socially interacting people. This hypothesis accounts for the spatial scale of sedentism in Northwest North America.

*Amick, Daniel (Desert Research Institute)*

**[97] FOLSOM DIET BREADTH AND LAND USE IN THE AMERICAN SOUTHWEST**

Site survey and private artifact data are used to evaluate patterns of Folsom subsistence and settlement in the American Southwest. Faunal assemblages suggest many nonbison species are taken in inverse proportion to body size. Also the important role of canids requires greater attention. Site locations generally correspond with edible plant richness while isolated points are associated with faunal richness. Patterns of toolstone distribution imply large regional hunting territories. These patterns show limited connections between the Basin and Range and Southern Plains. Regional contrasts of residential and logistical land use are indicated by variation in the weaponry assemblages.

*Amorosi, Thomas (Hunter College-CUNY), Jon Sadler (Durham), Jim Woollett (CUNY Grad Center), and Jon H. Ingimundarsson (School of American Research-Santa Fe)*

**[79] THE SCANDINAVIAN NORTH ATLANTIC COLONIES**

Beginning ca. A.D. 800, Scandinavian maritime agriculturalists colonized the offshore islands of the North Atlantic. By A.D. 1000, an initially uniform culture and economy extended from Norway to Newfoundland. By 1500, the Scandinavian North Atlantic developed into a diverse set of island societies. Vinland failed within a generation, Greenland's Norse population died out after 500 years, Iceland suffered major population loss while communities in the eastern North Atlantic experienced economic expansion. Local and regional politics, different island environments, distance from core markets, and Norse environmental impact all played roles in these different outcomes.

*Amundson, R.G. (see Jabren, H.) [25]*

*Anderson, David (National Park Service) [Discussant 88]*

*Anderson, T. (see Storck, P.) [74]*

*Ansuetz, Kurt F. (Michigan)*

**[58] FLOODS, FROSTS, HOT ROCKS, AND SYSTEMS OF WATER MANAGEMENT: RECONSIDERING CLASSIC PERIOD ANASAZI AGRICULTURAL PRACTICES IN THE NORTHERN RIO GRANDE**

Archaeologists have traditionally suggested that the aggregated Pueblo Indian populations living in the northern Rio Grande during the Classic period necessarily supported themselves through large-scale canal irrigation. As investigators began to formally recognize the widespread distribution of cobble-bordered and gravel-mulched fields, they reasoned that these facilities constituted a crucial technological strategy for coping with periodic drought and unpredictable frost. Recent research indicates Anasazi farmers made their livelihood through the extensive modification of the natural landscape and the use of diverse planting practices. Where locally feasible, these efforts formed coherent systems of water management for agricultural production in cool, high desert settings.

*Anslinger, C. (see Stafford, R.) [97]*

*Anthony, David W. (Hartwick College)*

**[64] PREHISTORIC MIGRATION AS SOCIAL PROCESS: MATERIAL AND SOCIAL CONSTRAINTS.**

Migration has for too long been demonized and mystified in archaeology. It has been demonized as a weak simplification taken seriously only by normative culture historians—an accusation that is manifestly

untrue among contemporary economists and demographers; and it has been mystified as a chaotic and unpredictable activity—whereas it is in fact one of the more regular and rule-bound human behaviors. A brief review of materialist economic and demographic migration models is followed by a consideration of social and ideological constraints on migration. Some recent archaeological applications of migration models indicate directions that might be successfully pursued.

*Anuskiewicz, Richard J. (Minerals Management Service), Philip R. Gerrell (Ecology and Environments), James S. Dunbar (Bureau of Archaeological Research, Florida Department of State), and Joseph F. Donoghue (Florida State)*

**[41] EVIDENCE OF PREHISTORIC MAN ON THE NORTH AMERICAN CONTINENTAL SHELF FROM A SINKHOLE LOCATED 32 KM OFFSHORE IN 12 M SEAWATER**

This paper will discuss a cooperative research effort between academic, State, and Federal agencies which researched and found evidence of prehistoric activity at a submerged sinkhole 32 km offshore. This drowned karst feature is located in Apalachee Bay, Florida, in the Gulf of Mexico, about 32 km (21 mi) offshore in 12 m of water. Evidence presented will focus on analysis of Carbon dates from organic samples, and recovered lithic debitage collected at the site.

*Arnold, Dean (Wheaton College)*

**[71] CERAMIC THEORY AND MOLD-MADE CERAMIC PRODUCTION: IMPLICATIONS FOR CRAFT ORGANIZATION**

Ceramic production using vertical half molding is sometimes regarded as the result of an evolved, efficient technique to create uniform product. Ethnoarchaeological observations from Ticul, Yucatan, Mexico, also suggest that a molding technology requires little skill, and more space and capital than traditional technologies and is paste, shape and size dependent. Molding results from increased demand for ceramic products in which increased tools and space replace traditional knowledge and skill and a decreased amount of labor. The implications of these observations for the evolution and identification of craft organization in antiquity are briefly explored.

*Aronsen, G. (see Bray, T.) [19]*

*Arriaza, B. (see Cassman, V.) [22]*

*Arriaza, Bernardo (Nevada-Las Vegas)*

**[22] CHINCHORRO BLACK PERIOD: SERIATION AND SOCIAL COMPLEXITY**

The seriation of the Chinchorro mummies reveals several kinds of artificial mummification techniques which changed through time. This paper will concentrate on one of them, the Black Mummies. Of all the Chinchorro mummies with artificial mummification, the Black Mummies were the most complex and the oldest, dating from 5,000 B.C. to 3,000 B.C. This "black" practice appears to have been concentrated around the present city of Arica, from where it spread south about 200 km.

*Arsenault, Daniel (Laval University)*

**[15] THE "SACRED FEMALE WEAVER" IN A MOCHE SACRIFICIAL CONTEXT: A REAPPRAISAL OF SOME IMAGES OF HUMAN SACRIFICE IN MOCHE ICONOGRAPHY**

A comparison between recent archaeological findings (from Sipán and San José de Moro) and images of a Moche sacrificial ritual has allowed some scholars (Donnan and Castillo 1992) to show that individuals could have personified some major figures (A, B and C) of this sacrificial iconography. This paper aims to show that some burial remains found at Huaca de la Cruz (Strong and Evans 1952) could also be related to these images. In particular, a woman, buried with weaving tools, could have typified one of the two figures E, collectors of the sacred blood. This interpretation will help to better understand gender relationships in a Moche sacrificial context.

*Ashmore, W. (see Leventhal, R.) [60]*

*Aswani, Shankar (Hawaii)*

**[100] SOCIAL COMPLEXITY AND TONGAN MARITIME EXPANSION**

In this paper we outline an evolutionary model for the origins of socio-political hierarchy and maritime expansion in the Tongan Islands from the twelfth century A.D. Drawing on ethnohistoric and archaeological evidence, we examine the role of within and between group resource competition. Changes in population density, territoriality, military balance, and opportunities with migration play significant parts in an environment of variable productivity.

*Athens, J. Stephen (International Archaeological)*

**[94] LANDSCAPE ARCHAEOLOGY ON A MICRONESIAN HIGH ISLAND: PREHISTORIC SETTLEMENT AND AGRICULTURE IN KOSRAE**

A landscape archaeology orientation to field and laboratory investigations has provided a wealth of new information concerning initial settlement and the development of agriculture on Kosrae, a small high

island of central Micronesia. Investigations emphasized the development of coastal landforms and included excavations in non-site locations, volumetric control of midden recovery and fine screening, quantification of charcoal in sediments, wetland sediment coring, pollen and charcoal particle analyses, and wood species identification of charcoal. Although more often associated with continental areas, the Kosrae case shows that landscape archaeology can be an especially productive approach for small tropical Pacific islands.

*Aufderheide, Arthur C. (Minnesota) and Marvin J. Allison (Medical College of Virginia)*

[22] BIOANTHROPOLOGICAL STUDIES OF SPONTANEOUSLY MUMMIFIED BODIES OF A LATE PHASE CHINCHORRO SITE (MORRO 1-6) IN NORTHERN CHILE

Reconstruction of health, subsistence strategies and cultural features of a northern Chile maritime, Archaic period population (the Chinchorros) was carried out by examination of 69 spontaneously mummified bodies from the Morro 1-6 site near Arica, Chile. Bioanthropological studies included chemical dietary reconstruction, radioimmunological detection of cocaine in mummy hair, coprolite analysis and anatomical studies.

*Awe, J. (see Healy, P.)* [44]

*Ayers, William S. (Oregon) and Gales, Gordon G. (Oregon)*

[6] GEOCHEMICAL CHARACTERIZATION OF LITHIC MATERIALS IN MICRONESIA

A review of lithic material distributions from archaeological contexts in Micronesia shows significant evidence of long distance movement of stone raw materials and finished products. However, the lack of systematic geochemical characterization research limits detail regarding provenance; given the far reaching inter-island contacts known historically it should be possible to identify archaeological signatures in stone artifacts, even in atolls, with further study. The restricted range of stone material as a component of the technology suggests that in some areas ceramics may provide a more useful indicator of trade links. Specific evidence from the Pohnpei area is discussed.

*Aylesworth, Grant R. (Tulane)*

[60] RECONSIDERING CHULTUNS IN THE SOUTHERN MAYA LOWLANDS

Chultuns are small chambers excavated into limestone bedrock by the ancient Maya. This review and critique of past chultun research along with recent archaeological findings in Belize form the basis of a reconsideration of chultun function, form, and distribution in the Southern Maya Lowlands. Discussion includes a consideration of variance in chultun morphology, micro and macro distribution patterns, and linguistic evidence. In particular, the debate over food storage and the distinction between primary and secondary chultun functions is evaluated and questioned.

*Baenziger, Marsba S. (Missouri), Tom Dillebay (Kentucky)*

[25] METHODS FOR IDENTIFYING OPAL PHYTOLITHS: MONTE VERDE, A CASE STUDY OF PANICOIDS

Methods for determining phytoliths within the warm-season photosynthetic pathway are discussed. Both warm-season and cool-season panicoids are analyzed using macroremains and comparative material. Preliminary findings indicate the phytoliths are differentiated even within the warm-season pathway based on their chemical components. Using this determination, residue from soils, feces, and tools from the 13,000 year old Monte Verde, Chill, occupation is discussed and compared to an earlier level.

*Ball, Terry B. (Brigham Young University), Michael D. Standing (Brigham Young University), and Wilford M. Hess (Brigham Young University)*

[25] 3-D MICROSCOPY AND IMAGE ANALYSIS OF PHYTOLITHS

Study of phytolith three-dimensional structure may lead to improved phytolith systematics. In this study the potential of using confocal microscopy and computer-assisted image processing to create and manipulate 3-D images of individual phytoliths was evaluated. Optical serial sections of fluorescent stained maize phytoliths were made using a laser confocal microscope. The sections were reconstructed into 3-D images of the phytoliths using computer-assisted surface rendering algorithms. The 3-D images were manipulated to view and measure the phytoliths in all possible orientations. This procedure appears to have excellent potential for the study of phytolith 3-D typology and morphometrics.

*Bamforth, Douglas B. (Colorado-Boulder)*

[66] THE WINDY RIDGE QUARTZITE QUARRY: HUNTER-GATHERER MINING ON THE CONTINENTAL DIVIDE

Windy Ridge is a quarry/camping site south of Steamboat Springs in the Colorado Rocky Mountains which was exploited at least from the Late Paleoindian through Late Prehistoric periods. Intensive survey located 182 "quarry pits" on the site, but excavation of one "pit" revealed a network of trenches cut at least five feet down through solid rock. Despite the enormous labor investment evident at the site, Windy Ridge quartzite is not widely distributed in Colorado. These data illuminate aboriginal adaptations in the Colorado

Mountains and imply that hunter-gatherer lithic procurement can be far more labor-intensive than many archaeologists have thought.

*Bamforth, Douglas B. (Colorado-Boulder)* [Discussant 49]

*Bangs, Eric W. (Larson Anthropological/Archaeological Services) and Dennis E. Lewarch (Larson Anthropological/Archaeological Services)*

[18] SPATIAL AND TEMPORAL ORGANIZATION OF LITHIC MANUFACTURING AND TOOL USE AT WEST POINT

Analysis of lithic debitage and tool spatial organization provides a clue to long-term land use patterns and activity area placement at West Point. Debitage is classified by lithic material type and place in a core reduction sequence while tools are coded using a paradigmatic classification based on pattern and distribution of use-wear attributes. Analysis of lithic patterns by component demonstrates some change in tool manufacturing techniques and types of lithic material exploited through time. Non-local lithic material, projectile point styles, and decorative artifacts demonstrate linkages with British Columbia, the Columbia Plateau, and southern Oregon.

*Banks, William (Kansas)*

[105] PREHISTORIC ACTIVITIES AND LITHICS OF FARRA CANYON: THE ARCHAEOLOGY OF A SMALL CATCHMENT BASIN

Farra canyon is a small catchment basin in Blaine County, Oklahoma. This canyon has experienced dramatic Holocene erosion, especially in the last two decades, which has uncovered lithic materials from the Paleoindian period through the Late Prehistoric. A wide range of material types are present in the assemblage. By analyzing lithic artifacts and material types, conclusions on changes in the occupational pattern and utilization of the canyon are provided. Because both the canyon and the assemblage are so diverse, activities pertain to the catchment as a whole.

*Barbour, Warren T. D. (SUNY-Buffalo)*

[34] CHILDHOOD'S LEGACY: THE INHERITORS OF URBAN CIVILIZATION

Children have been largely ignored in the archaeology of ancient civilizations. While appearing in burials and sacrifices, children are mostly hidden from the archaeological record by their passage into adulthood and an urban world of art, architecture and artifacts that express a broader horizon. As an example of weaving children into the fabric of early urban society I have taken a new look at ceramic figurines from ancient Teotihuacan, Mexico that were most likely toys. As such they are not superfluous but important clues to the world and role of children who became the farmers, craftspeople, soldiers, bureaucrats, priests, and rulers.

*Barnett, P. (see Storck, P.)* [74]

*Barton, C. Michael (Arizona State) and Geoffrey A. Clark (Arizona State)*

[27] SYMPOSIUM INTRODUCTION: EVOLUTIONARY THEORY IN ANGLO/AMERICAN ARCHAEOLOGY

The widely perceived lack of general theory has long been seen as a shortcoming of archaeology, and more generally of anthropology. We suggest, however, that Anglo/American archaeology has operated for several decades under a general theory of culture change that is broadly analogous in biases and operation to Neo-Darwinian evolutionary theory. This paradigm is seldom made explicit, partly because of the history of the discipline and partly because of the lack of in-depth understanding of biological evolution by many archaeologists. As exemplified here, evolutionary theory can provide a unifying conceptual framework, diverse archaeological programs and further the explanation of long-term social process questions.

*Bartram, Jr., Laurence E. (South Carolina)*

[84] A COMPARISON OF KUA (BOTSWANA) AND HADZA (TANZANIA) BOW AND ARROW HUNTING

Bow and arrow hunting among two groups of contemporary African foragers, the Kua of the east-central Kalahari in Botswana and the Hadza of northern Tanzania, is compared. Bow and arrow hunting is an economically significant activity among both groups. This paper describes the technological, organizational, and environmental factors that influence the design, manufacture, and use of bow hunting equipment by each group. Similarities and contrasts between the two in terms of these factors are explored. Habitat type and complexity are identified as key elements conditioning equipment design, use, and hunting style.

*Bar-Yosef, O. (see Belfer-Cohen, A.)* [47]

*Bar-Yosef, O. (see Stiner, M.)* [19]

*Bar-Yosef, Ofer (Harvard University)*

[45] THE IMPACT OF LATE PLEISTOCENE-EARLY HOLOCENE CLIMATIC CHANGES IN SOUTHWEST ASIA

The climatic fluctuations during the Terminal Pleistocene and Early Holocene in the Near East are recorded in deep sea cores in the Eastern Mediterranean, pollen cores in lakes and geomorphic modifications. The



trends toward increasing temperatures and precipitation effected first the lowlands and the southern parts of the region. Their impact on human groups were filtered through the dynamic or conservative social mechanisms that characterize hunter-gatherers and early farmers. The shifts to sedentism, incipient cultivation and animal husbandry, although not appearing simultaneously, are interpreted as the results of processes that were initiated as socio-economic reactions to environmental changes.

*Baryshnikov, G. (see Hoffecker, J.)* [94]

*Barnes, M. (see Fleming, D.)* [15]

*Barnes, M. (see Sbeets, P.)* [48]

*Bayham, Frank (California State-Chico) and Jack Broughton (Washington)*

[65] RODENT AND LAGOMORPH REMAINS AS INDICATORS OF RESOURCE STRESS: AN EXAMPLE FROM THE PITHOUSE PERIOD IN WEST TEXAS

The importance of rodent and lagomorph utilization to prehistoric subsistence in the desert Southwest has been well-documented. Yet, energetic return rates for these taxa can be quite low decreasing their rank as preferred food items. Additionally, intense and continuing use of these prey items can alter the age profile of the exploited population. We use these relationships and some exploitative correlates to identify an extreme case of resource stress occurring during the late Pithouse Period in the Hueco Bolson region of west Texas.

*Bayman, J. (see Fish, P.)* [26]

*Bayman, James (Arizona State)*

[23] THE ROLE OF SITE SURFACE DATA IN INTERPRETING A HOHOKAM PLATFORM MOUND COMMUNITY CENTER

This paper evaluates the utility of surface archaeological data and the substantive contributions that such data have made to a long-term research program in the northern Tucson Basin in Arizona. Patterning in surface data provide a framework for defining regional land-use, multi-site community organization, and intra-site spatial structure in the prehistoric Sonoran Desert. Surface archaeological data are also useful for interpreting political economy and organization of craft production at these multiple scales. The inferential potential of surface artifact distributions at a Classic period platform mound community center is explored and illustrated.

*Beauchamp, Renee (Tennessee)*

[78] AGING WHITE-TAILED DEER IN NORTH AMERICA: INVESTIGATIONS OF THE DENTAL CROWN HEIGHT MEASUREMENT TECHNIQUE

This study of aging techniques for high-crowned ungulates determined that dental crown height measurements were the most accurate, non-destructive technique. Dental crown height measures were derived from a population of known-age white-tailed deer. The measurements were applied to an archaeological white-tailed deer population from the Hayes site in Middle Tennessee. Mortality profiles for the archaeological specimens were established and used to determine prehistoric hunting practices at Hayes.

*Beaudry, M. (see Murphy, L.)* [38]

*Beaudry-Corbett, Marilyn P. (California-Los Angeles) and John S. Henderson (Cornell)*

[71] REGIONAL APPROACH TO POTTERY CLASSIFICATION AND ANALYSIS: A HONDURAN CASE

Recent comparative analysis and other collaborative work have resulted in the identification of regional patterns of variability in ceramic shape and decoration. Ceramic systems are useful for summarizing these patterns and their spatial and temporal distributions. This paper reviews some of the specific classificatory advances made through this cooperative research, identifies potentially productive directions for future research, and considers the methodological and theoretical implications of approaching ceramics at a regional level.

*Beck, Charlotte (Hamilton College) and George Jones (Hamilton College)*

[96] DIFFUSION AND TYPOLOGICAL VARIATION

Almost nowhere have assessments of projectile point typology been taken further than in the Great Basin. But archaeologists have continually experienced inconsistencies in chronological inferences derived from the Great Basin projectile point typology. These inconsistencies have stimulated numerous debates concerning chronological positions of particular types in different parts of the Basin. Some of this confusion may be attributed to differential diffusion of attributes across space—that is, lag time or recombination of attributes in different areas. Here we examine the histories of different attributes and attribute combinations to assess the effects of their differential diffusion on typological variation in the archaeological record.

*Beck, Colleen M. (Desert Research Institute)*

[75] THE NTS CAVE SITE

In 1992, an undisturbed cave site was discovered on the Nevada Test Site in southern Nevada. The artifacts indicate that this cave was last occupied by Native Americans no more than 100 years ago. This paper discusses possible interpretations of the distribution of the cultural materials and presents the procedures developed for the management of the site.

*Beekman, Christopher (Vanderbilt University)*

[30] A CLASSIC PERIOD POLITICAL BOUNDARY IN THE SIERRA LA PRIMAVERA REGION, JALISCO, MEXICO

During the Mesoamerican Classic Period, the Sierra La Primavera in west-central Jalisco is hypothesized to have been a cultural and/or political boundary between the Teuchitlan Tradition of west Mexico and polity(s) closely allied with central Mexican groups, especially Teotihuacan. Ongoing research, drawing on settlement and artifact distributions, now allows us to make preliminary conclusions about the reality of the boundary, its nature, and the structural complexity of the polities on either side of it.

*Begay, Richard (Navajo Nation)* [Forum Participant 95]

*Belfer-Coben, Anna (Hebrew University) and Ofer Bar-Yosef (Harvard University)*

[47] TOWARDS VILLAGE LIFE IN THE NATUFIAN

The combined effects of climatic shifts and changing socio-economic strategies resulted in the emergence of small sedentary hamlets during the Natufian period in the southern and central Levant. However, the full-fledged villages, with public sacred facilities are archaeologically evidenced only since the Early Neolithic and have developed rapidly during the 10th and the 9th millennia B.P. (uncalibrated). With the diffusion of agricultural techniques and herding into Anatolia and the Zagros mountains, large villages with elaborate exchange networks, mixed economy and hierarchical social structure emerged, while groups of hunter-gatherers continued to survive in their immediate vicinity for another two millennia.

*Bell, Ellen (Pennsylvania) and Patricia Urban (Kenyon College)*

[19] CONSTRUCTING AN IMAGE: FIGURINE, WHISTLE, AND OCARINA MANUFACTURE IN THE NACO VALLEY, NW HONDURAS, AND ITS POLITICAL IMPLICATIONS

Ceramic figurines, whistles, and ocarinas (FWO) are commonly found throughout Late Classic period (A.D. 600-950) southern Mesoamerica. Relatively little is known about FWO manufacturing processes, however. This gap frustrates reconstructions of ancient political economies as skill and material requirements cannot be specified. Research in the Naco valley, NW Honduras, has yielded a wealth of material of Late Classic age relevant to this topic (2,573 FWO fragments and 74 ceramic molds). This poster session outlines the production steps by which Naco figurines, whistles, and ocarinas were fashioned and their role(s) within the Late Classic political economy.

*Benallie, Larry (Navajo Nation Archaeology Department) and Anthony L. Klesert (Navajo Nation Archaeology Department)*

[93] NATIVE AMERICANS AS PROFESSIONAL COLLEAGUES

A sure sign of the continued colonialistic nature of American archaeology is the percentage of Native Americans involved as professionals. There are many reasons for the dearth of native colleagues, but these must be surmounted if the profession is to transcend its past and flourish. The profession must recruit from the ranks of those it studies, and must be willing to broaden its definitions of normal science in the process. The experiences of a number of tribal and university programs are offered as models for the profession, as it begins to accept its responsibility for this effort.

*Benfer, R. (see Pearsall, D.)* [25]

*Bennett, S. (see Hanson, C.)* [76]

*Bennett-Rogers, Ann (US Forest Service, Willamette National Forest), John Fagan (Archaeological Investigations Northwest), and Anthony Farqu e (US Forest Service, Willamette National Forest)*

[35] FROM QUARRY TO CACHE—OBSIDIAN PROCUREMENT IN THE CENTRAL CASCADES OF OREGON

The discovery of a biface cache consisting of numerous whole and fragmentary pieces precipitated a study of obsidian procurement and transport. The cache recovered from the western slopes of the Cascade Mountains in the Santiam River drainage was sourced to Obsidian Cliffs. Individual comparable biface artifacts have been recovered from archaeological sites in the area. This paper will describe the cache site and a study of the quarry site in relationship to a known trail system.

**Benz, Bruce F. and Karen Laitner Benz (Instituto Manantlan de Ecología)****[36] ADDITIONS TO THE TUXCACUESCO CERAMIC COMPLEX IN SOUTHERN JALISCO**

Isabel Kelly's work in southern Jalisco characterized a highly polished and incised red ware ceramic complex that she attributed to the latter half of the first millennium B.C. Test excavations in a small site in the El Grullo valley of southwestern Jalisco uncovered additions to this ceramic complex including resist painted and iridescent forms. An apparently earlier though associated ceramic complex was also encountered. This ceramic complex is characterized by polychrome—purple, orange and white on red—decoration on jars, ollas and plates where incision is absent. Figurines associated with this polychrome complex exhibit forms similar to those of the Tuxcacuesco complex but also include hollow forms that are finished in red and white or fugitive yellow paint.

**Benz, Karen Laitner (see Benz, B.) [36]**

**Berg, Caryn (SWCA, Inc.)****[72] MICROWEAR ANALYSIS AND THE INFORMAL TOOL KIT AT ELDEN PUEBLO**

The purpose of this study was to examine the informal tool kit from Elden Pueblo using high power microwear analysis. The primary objective was to determine tool use in relation to subsistence activities at the pueblo. Key findings indicate that the informal tools at Elden Pueblo were primarily used in a way that represents a hunting and gathering lifestyle in addition to agriculture. It has also been determined that high power microwear analysis is successful for determining use of informal tools and should be applied more often to assemblages in the Southwest.

**Bergman, Christopher (Northern Kentucky University)****[84] SINEW REINFORCED AND COMPOSITE BOWS: TECHNOLOGY, FUNCTION, AND SOCIAL IMPLICATIONS**

Sinew reinforcement or "backing" of a bow involves applying high tensile strength sinew to the weapon's outside curve. Thus applied, sinew allows for a shorter bow length without an increased risk of breakage. A shortened bow provides greater maneuverability, particularly on horseback. However, bows of this type were not always manufactured by people using equid transport. From a historical perspective, composite bows represent a further developmental trend in which materials of different properties are combined, producing a mechanically efficient weapon. Generally speaking, the complicated nature of composite bow production usually implies the presence of specialized craftspeople within a society.

**Bernstein, David J. (SUNY-Stony Brook), Robert M. Cerrato (SUNY-Stony Brook), and Heather V.E. Wallace (SUNY-Stony Brook)****[92] LATE WOODLAND USE OF COASTAL RESOURCES AT MOUNT SINAI HARBOR, LONG ISLAND, NEW YORK**

Seasonality, taphonomic, and faunal data are used to examine the use of coastal resources at Mount Sinai Harbor on the north shore of Long Island. Seasonal growth studies of multiple species of shellfish are employed to reconstruct the occupational history at one intensively excavated site (van der Kolk). Results suggest a very short occupation and provide interesting methodological data useful in the analysis of similar sites. Faunal and taphonomic information afford insights into both the structure of the van der Kolk site and the use of vertebrate species by the late prehistoric inhabitants on Long Island's north shore.

**Bettinger, R. (see Eerkens, J.) [27]**

**Bettinger, Robert L. (California-Davis) [Discussant 90]**

**Bettinger, Robert L. (California-Davis)****[47] THE EMERGENCE OF SEDENTISM IN THE INYO-MONO REGION, EASTERN CALIFORNIA**

At the time of Euroamerican contact, the Inyo-Mono region of eastern California was more densely and permanently settled than any other part of the Great Basin. Archaeological data suggest this reflects long-term competition for scarce resources in a productive but crowded environment. Competition is expressed initially in the formation of a well-defined seasonal round between 3500 and 1400 B.P., prior to which annual peregrinations were erratic. Subsequent responses to competition include sharply diminished annual movement culminating in the appearance of permanent villages and more intensive use of resources naturally available in bulk (e.g., pinenuts and ricegrass) and marginal resource patches (e.g., alpine environments).

**Bey, George (Millsaps College), Craig Hanson (Tulane), and Jennifer Sandlin (New Mexico)**  
**[60] EXCAVATIONS IN THE SACRIFICIOS GROUP, LATE CLASSIC LIFE IN EK BALAM**

The Sacrificios Group consists of a number of structures loosely centered around a central plaza just outside the walled ceremonial center of Ek Balam. The results of excavations carried out in this area during the 1989 and 1992 field seasons are presented. These excavations, which tested six structures as well as the plaza and off-structure areas, produced data used in a preliminary reconstruction of Late Classic Maya life within this group. Questions approached through interpretation of the data include "what was the nature

and duration of the occupation?"; "how were the various structures and intervening spaces used?"; and "what was the Sacrificios Group?"

**Bicbo, Nuno (Drew University)****[16] LITHIC RAW MATERIAL ECONOMY AND HUNTER-GATHERER MOBILITY IN THE LATE GLACIAL AND EARLY POSTGLACIAL PORTUGUESE PREHISTORY**

The Portuguese Final Upper Paleolithic and Epipaleolithic were marked by knowledge of the landscape that guided seasonal movements of the population. These followed inland-coastal routes, possibly between the Atlantic coast and inland river valleys. Although the data are still limited, they suggest that these routes targeted certain points on the landscape such as regional sources of lithic raw materials. Chert, quartz, and quartzite, the desired resources, were characterized by different reduction strategies. Apparently, the diversity in reduction sequences and in raw materials promoted the mobility of these hunter-gatherer groups.

**Billman, Brian (California-Santa Barbara)****[77] POLITICAL INTEGRATION AND DISINTEGRATION DURING THE EARLY INTERMEDIATE PERIOD IN THE MOCHE VALLEY, PERU**

The Early Intermediate Period in the Moche Valley begins with the formation of the Moche State and ends with the decline of this polity. Although perhaps the first multi-valley state to have evolved in the Andes, the origin and demise of this polity is poorly understood. This paper presents the results of a settlement pattern study of the Moche Valley. Analysis indicates that intrusions of highland groups into the middle valley played a critical role in the formation of the Moche State. Although the decline of this polity remains an enigma, analysis indicates that the collapse occurred during a period of intense warfare.

**Binning, Jeanne Day (California-Riverside)****[61] BIPOLAR FLAKED-STONE REDUCTION IN PREHISTORIC AND PROTOHISTORIC SOUTHERN CALIFORNIA**

There are many statements in the anthropological literature regarding the use of bipolar reduction by hunters and gatherers. After examining more than fifty prehistoric and protohistoric flaked-stone assemblages from southern California, several conclusions regarding the identification of bipolar debitage and the role of bipolar reduction in hunter and gatherer manufacturing behavior became apparent. Replicative experiments and replicated debitage were instrumental to the analysis. Several of the long-standing conclusions in the literature regarding bipolar reduction are questioned.

**Birmie, Robert (Soil Systems Inc.)****[72] PUEBLO II OCCUPATION, SITE STRUCTURE, AND ARCHITECTURAL VARIABILITY ON THE UTE MOUNTAIN UTE RESERVATION, SOUTHWESTERN COLORADO**

The Ute Mountain Ute Tribe is developing 7634 acres in southwestern Colorado. Twenty-four Pueblo II sites are located in the project area, nine of which will be impacted by development. Data recovery has been completed on six sites and testing at three sites. Tree ring dates from four sites indicate an A.D. 1030-1060 occupation and the remaining sites date from A.D. 1050-1150. Artifact assemblages are similar in terms of the ceramic and lithic artifact structure and architectural styles. This paper discusses this variability and makes regional comparisons.

**Biskowski, Martin (California-Los Angeles)****[30] SOCIOECONOMIC DIFFERENTIATION IN MAIZE-GRINDING AT TEOTIHUACAN**

Measuring the significance of utilitarian craft products to the growth of complex societies is difficult because few kinds of craft goods provide adequate information about contexts of production, exchange, and use. In Mesoamerica, the study of long-ignored maize-grinding tools can help fill this void. Data describing tool form and stone material properties can indicate differences in methods of food preparation, in the accessibility of various subsistence resources, and in the means by which households obtained grinding equipment. At Teotihuacan, such data help characterize the nature of low-to-middle status socioeconomic differentiation.

**Black, Andrew (SUNY-Binghamton)****[104] SOCIAL ASPECTS OF FAUNAL EXPLOITATION: AN EXAMPLE FROM CENTRAL GHANA**

Zooarchaeologists have explored many factors that influence people's use of animals, such as herd management, hunting technology, and resource abundance. Yet few studies have taken into account the enormous influence of social structure and cosmology on economic decision making. Using ethnographic and archaeological data from the Banda Traditional Area of Ghana, this paper explores how social structure and cosmology influence mean consumption in one rural community, and how much non-functional decision making creates a disjuncture between the perceived living assemblage, and the archaeological one.



*Black, Stephen L. (Texas-Austin), Kevin Jolly (Texas-Austin), and Daniel R. Potter (Texas-Austin)*

[19] THE HIGGINS EXPERIMENT: AN ELECTRONIC APPROACH TO EXCAVATION DATA MANAGEMENT

A recent excavation in south-central Texas coupled total data stations with laptop computers to manage block excavation. The system virtually eliminated the need for paper forms, and allowed the entry of over 30,000 plotted artifacts, 1500 formal tools, and 150 pages of field notes during a ten-week field season. The total stations provided three dimensional artifact and feature provenience, allowing excavators to work in natural layers, instead of the imposed bounds of a metric unit/level. Electronic field data collection reduced errors, redundancy, and lab processing time, bringing useful analysis much closer to the excavation than is possible with traditional methods.

*Blake, Michael (British Columbia) and John E. Clark (Brigham Young University)*

[59] EARLY FORMATIVE MOKAYA VILLAGES OF SOUTHEASTERN MEXICO

It has long been known that the coastal lowlands were home to some of Mesoamerica's earliest sedentary villages. Until recently, however, we knew much more about early village life in the highland regions of Mexico than in the lowlands. Based on archaeological work from 1985 to 1993 we summarize and update the patterns of early village life among the "Mokaya" who inhabited the Pacific coast of Chiapas, Mexico, from 1550 B.C. to 1000 B.C. The Mokaya sites we examine provide new information about changes in society, polity, and economy after the Late Archaic period, and help us explore the processes of emerging inequities and complexities of village life.

*Blanco V., Aida (National University of Costa Rica)*

[32] ANALYSIS OF PLANT REMAINS FROM THE RIVAS SITE

Plant remains from the Rivas site consist almost entirely of carbonized seeds, husks, and other parts. Analysis of them indicates the presence of maize, a variety of palm fruits, and other cultivated and collected resources. In addition to providing information on subsistence, these materials provide insights into the prehistoric environment and possible regional exchange of plant products. These topics will be discussed in light of ongoing studies.

*Bleed, P. (see Hitchcock, R.)* [84]

*Bleed, Peter (Nebraska-Lincoln)* [Discussant 84]

*Blinman, Eric (Museum of New Mexico), Clint Swink, Lawrence R. Sitney (Museum of New Mexico), David S. Phillips (LANL Ceramic Science and Technology), and Joel M. Brisbin (Mesa Verde National Park)*

[19] THE FIRING OF ANASAZI POTTERY

Anasazi pottery technology involves a complex interaction between shale clays and a carefully controlled firing regime. The recognition of hundreds of prehistoric trench kilns in the Four Corners area of the American Southwest has prompted 10 years of replication firing experiments, bringing together a consortium of potters, archaeologists, and materials scientists. Recent experiments have duplicated both the stratigraphy of kilns at Mesa Verde National Park and the qualities of Anasazi pottery. These successes have also focused laboratory research on the sintering of shale clays, enhancing both the practical and scientific understanding of this prehistoric technology.

*Blitz, Jennifer (Wisconsin-Madison)*

[104] DIETARY RECONSTRUCTION AND SOCIAL STRATIFICATION: A CROSS-CULTURAL PERSPECTIVE

The use of bone chemistry in reconstructing ancient diet and human behavior has been applied to many New World civilizations. Whereas gross dietary differences (marine versus terrestrial) can be easily detected, the use of bone chemistry to observe finer, intra-population differences (social differentiation) may require more work. Chemical studies done on presumably socially stratified cultures, including the Zapotec, Maya, Inca, and chiefdoms of North America suggest almost no relationship between diet and social status. The lack of a relationship may be due to slight dietary differences that we do not recognize or cannot detect with our current analytical procedures.

*Blitz, John (Bowdoin College)*

[78] MOUND REOCCUPATION AND CO-OPTION OF SACRED AUTHORITY

Periodic addition of mound construction stages is a well-known characteristic of late prehistoric earthen platforms in the American Southeast. However, those exceptional mounds that exhibit radical temporal discontinuities in sequential mound-building episodes have received scant attention. Discontinuity in individual mound construction for intervals of 200 to 900 years, followed by reoccupation and the addition of new stages, is documented at numerous sites. Examples are presented and discussed. Mound reoccupation

is interpreted as a political strategy to fabricate mythic histories through co-option of older monuments, and so legitimate new social orders with appeals to sacred authority.

*Bodu, P. (see Julien, M.)* [16]

*Bolen, Kathleen M. (California-Berkeley)*

[34] CHANGING PERSPECTIVES: SOCIETAL CONSTRUCTION THROUGH CHILDREN

This paper explores children as producers of prehistory, and the role of children as agents in past societies. Drawing from the contributions of engendering past societies, our perspectives broaden further if we consider children. Children are the conduit for social reproduction of groups, and they contribute to the continuity or change interpreted in material culture. Relying on Linearbandkeramik settlement sites which represent colonization and implantation of the earliest villages in western Europe, this paper seeks to make the past visible from the perspective of children and thus better understand the construction of these past societies.

*Bonbage-Freund, Mary T. (Pennsylvania State)*

[30] THE ETOWAH SITE (9BR1): A PALEOETHNOBOTANICAL ANALYSIS OF WILBANKS PHASE CORN-COB FEATURES

This paleoethnobotanical evaluation of a pair of corn-cob dominated pits represents the first archaeobotanical investigation emerging from excavations at Etowah. Although Etowah is one of the best-known Mississippian sites in the American Southeast, it has been inadequately documented. These maize-filled basins are associated with an elite structure on a Wilbanks phase Mound B extension. A. R. Kelly identified this as a domicile in part based on proximity to these features. This study neither supports nor falsifies that classification. My experimentation and analysis demonstrate that corn-cob pits filled a universal need at Etowah and throughout the Southeast.

*Bonnichsen, R. (see Frison, G.)* [56]

*Boone, James L. (New Mexico)* [Discussant 100]

*Boone, James L. (New Mexico)*

[27] IS IT EVOLUTION YET? A CRITIQUE OF SELECTIONIST PROGRAMS IN ARCHAEOLOGY

Over the past decade, two distinct theoretical programs based in contemporary Darwinian theory have gained prominence in archaeology: 1) an evolutionary approach originally developed by Robert Dunnell and 2) evolutionary ecology. Somewhat confusingly, while both programs describe themselves as "selectionist" in orientation, they differ considerably in what they are trying to explain and how they go about explaining it. This paper outlines the aims and tenets of each program, shows how and why they differ, and offers some suggestions for a reconciliation between two approaches.

*Borrero, Luis Alberto (Programa de Estudios Prehistóricos)*

[56] THE PLEISTOCENE-HOLOCENE TRANSITION IN SOUTHERN SOUTH AMERICA

By the end of the Pleistocene human populations were widely distributed in the Southern Cone, although demography was probably very low. The Transition period was characterized by environmental instability, that included expansion of glaciers, explosive volcanic activity, and the opening of water barriers (i.e., Magellan Strait, Beagle Channel). Under those conditions populations were probably isolated enough to develop different histories, whose trajectories are traced for the period 13-8 ka B.P. using archaeological data from three regions.

*Bostwick, Todd W. (Pueblo Grande Museum) and Christian E. Downum (Northern Arizona)*

[26] PUEBLO GRANDE: A CASE STUDY IN HOHOKAM SOCIO-POLITICAL ORGANIZATION

This paper examines the origins, growth, function, and abandonment of the Pueblo Grande platform mound and its surrounding community. Drawing on a four-year archival analysis of past excavation records, we provide architectural and artifactual details that document important changes in the mound's function from Soho to Civano phases, and again from Civano to Polvorón phases. Inferred activities on the mound top and in its surrounding compound are used to assess competing models of Hohokam socio-political organization, particularly as these relate to Classic period phase transitions and collapse.

*Boucher, Sylviane (Instituto Nacional de Antropología e Historia, Centro Regional de Yucatán)*

[29] THE IMPLICATIONS OF ELITE CERAMICS: CORRESPONDENCES BETWEEN CHICHÉN ITZÁ AND TULA

The wealth of impressive imported goods at Chichén Itzá attests to this site's participation in a vigorous system of extra-regional connections during the Early Postclassic. To date, however, the function of ceramics in pan-Mesoamerican exchange has been poorly understood. This paper examines the role of imported luxury ceramics and homologous, locally produced copies in establishing symbolic correspondences among

politically independent entities across Mesoamerica. Examination of new ceramic data from recent CRY-INAH field seasons at Chichén, compared with recently published information on Tula ceramics, presents fresh empirical evidence on past-regional interaction.

*Bouey, P. (see Hildebrandt, W.)* [83]

*Bousman, C. (see Lanata, Jose)* [97]

*Bove, Frederick (California-Santa Barbara)*

[48] NEW CHRONOLOGICAL EVIDENCE FOR THE ARCHAEOLOGY OF THE PACIFIC COAST OF GUATEMALA

The juxtaposition of radiocarbon and archaeomagnetic dates with a large obsidian hydration sample from stratigraphic contexts has clarified key chronological periods within the Los Chatos-Manantial nuclear zone of the Guatemala lower coast. These new dates have produced the first clear evidence for a distinctive Middle Classic ceramic phase. Ramifications of these new data are discussed specifically in connection with the regional state evolutionary developments, problems associated with the Teotihuacan chronology, and the relation of the Los Chatos-Manantial polity with the Cotzumalguapa complex to the north.

*Bowen, Jonathan (Ohio Historical Society)*

[35] NOTCHED BUTTERFLY BANNERSTONE DISTRIBUTIONS

Notched Butterfly Bannerstones of banded slate were used as atlatl components about 2000 B.C. They are distributed throughout a 150,000 square km area centered in northwestern Ohio. Ninety per cent of the preforms have been recovered from four production centers, which are located 70 km apart in the midst of this area. None of these production centers is located near a concentration of the raw material. Although attached to atlatls, Notched Butterfly Bannerstones served primarily as symbols.

*Boyd, Carolyn E. (Texas A&M University) and J. Phil Dering*

[103] MEDICINAL AND HALLUCINOGENIC PLANTS IDENTIFIED IN THE SEDIMENTS AND PICTOGRAPHS OF THE LOWER PECOS, TEXAS ARCHAIC

Medicinal and hallucinogenic plants excavated from rockshelters in the Lower Pecos Region of southwest Texas are identified in the Pecos River Style rock art. These plants were recovered from general midden contexts, hampering interpretation of their utilization by the Lower Pecos people. A review of the ethnographic and ethnobotanical literature provides an explanation for the presence of these plants in the archaeological record. By providing textual clues to the use of hallucinogenic and medical plants, the pictographs are demonstrated to be a vital part of the archaeological record, a window into the socio-cultural system of Archaic hunters and gatherers.

*Brace, C. Loring (Michigan)* [Discussant 27]

*Bradford, Katherine (California State University, Northridge)*

[19] ECOLOGICAL SUCCESSION IN KELP FOREST COMMUNITIES AND IMPLICATIONS FOR INTERPRETING THE ARCHAEOLOGICAL RECORD

The impact of Holocene sea temperature fluctuation on prehistoric subsistence is the subject of much debate. These shifts affected kelp forest communities on which many prehistoric coastal populations were dependent for a portion of their food resources. Recent biological studies have documented the effects of climatic shifts due to El Niño-Southern Oscillation (ENSO) events. A computer simulation model, based on recent data, aids in illustrating changes that may have occurred as a result of ENSO and other conditions.

*Bradley, Bruce (Crow Canyon Archaeological Center)*

[89] PITCHERS TO MUGS: CHACOAN REVIVAL AND THE DEMISE OF THE MESA VERDE TRADITION

By the end of the thirteenth century, the Mesa Verde region of the American Southwest was permanently depopulated by ancestral Puebloan peoples. The mid 1200s was a time of dramatic change in settlement pattern, social organization, and control of natural resources. Evidence is presented that these changes are associated with a revitalization movement based on aspects of the defunct Chacoan system. The relationship of this revitalization movement to concurrent cultural changes to the south and its role in the ultimate abandonment of the region are also discussed.

*Brady, James (Dumbarton Oaks)*

[44] SETTLEMENT, ARCHITECTURE, AND IDEOLOGY IN THE PETEXBATUN REGION, GUATEMALA

The location and configuration of settlements are matters of first importance in any group's cultural geography. There is abundant evidence that caves were considered to be so sacred by the Maya that they were frequently incorporated into the structure of sites. The Petexbatun Regional Cave Survey has discovered a pronounced pattern of constructing architecture in relation to caves which suggests that caves may have

influenced the choice of site location and structured the layout of architecture. Enough examples exist to raise the possibility that caves may have been considered an essential feature for validating site location.

*Bray, Tamara L. (Smithsonian Institution), Javier Urcid (Smithsonian Institution) and Gary P. Aronsen (Smithsonian Institution)*

[19] COMPLEX ISSUES IN THE DETERMINATION OF THE CULTURAL AFFILIATION OF HUMAN REMAINS

A recent repatriation involving the Warm Springs Tribes and the Smithsonian Institution illustrates the difficulty of determining cultural affiliations of human remains in museums. The remains were recovered from burial islands near the Dalles, Oregon, a convergence point for coastal, plateau, and basin cultures. Though coastal groups traditionally engaged in cranial reshaping, the trait did not prove culturally diagnostic given that it also marked intra-group status. Within a context of multi-ethnic use areas, stratified societies, and mixed, multiple burials, precise cultural identifications proved impossible, even for historic period remains. This case highlights the necessity of engaging all potentially affiliated tribes in discussions about the disposition of specific remains.

*Brennan, Sheila C. (Massachusetts-Amherst), Blythe E. Roveland (Massachusetts-Amherst), and H. Martin Wobst (Massachusetts-Amherst)*

[34] PREHISTORY'S CHILDREN AND CHILDREN'S PREHISTORIES

Why is it that children's lives in the past have been underrepresented by archaeology and archaeologists? What messages do contemporary children receive about prehistory and prehistory's children? This paper introduces an overview of how children, both as consumers and producers of material culture in the past have been and might be researched by archaeologists. It questions some of the perceived and assumed barriers to an organized inclusion of children in legitimate research agendas. We also examine some of the ways in which children learn about prehistory and the extent to which children are present in these reconstructions of the past.

*Brenton, B. (see Levine, M.)* [34]

*Breternitz, Cory (Soil Systems, Inc.), Michael S. Foster (Soil Systems, Inc.), and Christine K. Robinson (Soil Systems, Inc.)*

[7] HOHOKAM REGIONAL EXCHANGE DURING THE CLASSIC PERIOD AS VIEWED FROM PUEBLO GRANDE

Sixteen months of excavation at the large Hohokam site of Pueblo Grande in the Phoenix Basin in central Arizona has resulted in recovery of information that broadens current knowledge of Hohokam regional exchange during the Classic period. New information on obsidian, intrusive ceramics, lithic raw material, and shell indicates that some procurement networks were more extensive than previously thought while others appear to have become more restricted. The data are summarized and existing models and interpretations of Classic period Hohokam regional economics are evaluated as is the distribution of such items across households in the project area.

*Brewington, R. (see Sbafer, H.)* [87]

*Brewington, Robbie L. (Texas A&M University) and Harry J. Sbafer (Texas A&M University)*

[89] GENERATIONAL CYCLES AND RATES OF CHANGE IN MIMBRES BLACK-ON-WHITE POTTERY

Stylistic changes within Mimbres Black-on-white Styles I, II, and III are evident in seriations of ceramic vessels from the NAN Ruin, middle Mimbres Valley, Grant County, New Mexico. The rates of change are dated using both stratigraphic and chronometric measures. An examination of these rates of change reveals a regularity that is thought to be related to generational cycles. These generational cycles are equated to Redman's "analytical individual" (1977:44).

*Brisbin, J. (see Blinman, E.)* [19]

*Brose, David (Royal Ontario Museum)*

[88] EXCAVATIONS AT 33ME274, A DATED *IN SITU* CLOVIS SITE IN NORTHEAST OHIO

The initial human occupation of post-glacial northeast Ohio occurred on soils washed from kame terraces between 13,100 and 11,700 B.P. (6 dates). Domestic activities between 11,060 and 10,800 B.P. (3 dates) are represented by four discrete 150 m/square zones of post-holes, hearths and pits of several forms, containing Clovis/Gainey points and a large assemblage of other worn and curated Paleoindian tools and debitage, of which 60% are of exotic cherts and flints. The site is sealed by 9,230 ± 80 B.P. (1 date) colluvial sediments from an Early Archaic occupation. Ancillary paleo-environmental data and cautious demographic speculations are offered.

*Broughton, J. (see Bayham, F.)* [65]



*Broughton, Jack (Washington)*

[61] AN EVOLUTIONARY ANALYSIS OF LATE HOLOCENE MAMMAL EXPLOITATION AROUND SAN FRANCISCO BAY, CALIFORNIA

Late Holocene archaeological mammal faunas from the San Francisco Bay shoreline document dramatic linear declines through time in the abundance of artiodactyls relative to sea otters. Causes for this change are evaluated through analyses of paleoenvironmental and other data from geological and archaeological sources. The changes in mammal exploitation do not correlate with changes in the estuarine and terrestrial environments. Extant data suggest that the patterning in mammal exploitation may be related to over-harvesting of artiodactyl prey. Preliminary results from analyses of the demographic structure of the artiodactyl prey provide a test for this hypothesis.

*Brown, David (Texas-El Paso)*

[15] TOWN PLANNING IN INKA PROVINCIAL ADMINISTRATION AT PUMPU, CENTRAL PERUVIAN HIGHLANDS

Investigations at the site of Pumpu in the Department of Pasco, Peru, have yielded new information concerning the organization and utilization of space at Inka provincial capitals. Similar in many ways to the nearby administrative center at Huanuco Pampa, Pumpu is nonetheless distinctive in certain aspects. Excavations indicate that a large portion of the site may be devoted to workshops. Additionally, stratigraphic separation of Inka components at the site suggest a series of changes through time, perhaps related to historical changes in the Inka Empire itself.

*Brown, J. (See Murphy, L.)* [38]

*Brown, J. (See Rogers, A.)* [35]

*Brown, James A. (Northwestern University)*

[96] TYPOLOGY FOR THE 90s—WHAT HAVE WE LEARNED?

Although typology will always have a central role in the practice of archaeology, a legitimate question to pose is whether the practice of typology has changed in response to a broadening of the discipline's goals and purposes that we have seen in the last decade. Many of the expectations that we have of typology have not changed all that much from the time of Montelius. But certain strengths and weaknesses of various approaches have emerged that offer useful guides to future practice. Such advances have come mainly through a clarification of ends as archaeology has emerged as a discipline with an agenda of its own.

*Brucbez, Margaret (Texas A&M University) and Michelle Woodward (Texas A&M)*

[10] PRELIMINARY RESULTS OF SURFACE SURVEYS, DEPARTMENT OF SOLOLÁ, SOUTHERN MAYA HIGHLANDS, GUATEMALA

This report outlines preliminary findings of systematic extensive and intensive surface surveys, surface collections and data analyses of cultural features of terrestrial surfaces of the high plateau and lake shore portion of the northern end of the basin of Lake Atitlan in the southern Maya Highlands. A rather sparse record of previous archaeological work at this location has caused a basic outline of cultural development to be unknown. The research strategy is explained which was developed to determine the nature and sequence of Preclassic to colonial events in the area long characterized as a "frontier" between not only Maya and pre-Maya peoples, but also Quiche, Cakchiquel, and Tzutujil speaking Maya.

*Bruguier, L. (See Zimmerman, L.)* [93]

*Brumfiel, Elizabeth M. (Albion College)*

[8] INTRODUCTION

Three seasons of survey and excavation at Xaltocan, Mexico, have defined the resources available to the occupants of the site and the changing patterns of resource utilization, A.D. 800-1500. This paper reviews the problems that guided research at Xaltocan, describes fieldwork at the site, and discusses the C-14 dates obtained for the various phases of prehispanic occupation.

*Brunswig, Jr., Robert H. (Northern Colorado)*

[66] TERMINAL PALEOINDIAN AND EARLY ARCHAIC CULTURE DYNAMICS AND PROCESS OF NORTHEASTERN COLORADO'S HIGH PLAINS AND ROCKY MOUNTAINS

One model of Early Archaic culture dynamics in the Western High Plains suggests that hot, arid Altithermal conditions effectively isolated regional populations in mountain and foothill "refugia." Later "re-occupation" of plains environments only occurred with amelioration of harsh Altithermal conditions after 4500 B.P. University of Northern Colorado research data suggest that a "hybridized" Terminal Paleoindian/Early Archaic cultural complex population may have exploited plains areas more than a hundred kilometers east of northeastern Colorado's foothills through much, if not all, of the Altithermal. Other evidence suggests that increasingly intensive plains exploitation began more than a thousand years prior to the end of Altithermal conditions, between 6000 and 5500 B.P.

*Brush, Nigel (Akron)*

[88] THE MARTINS CREEK MASTODON: A PALEOINDIAN BUTCHERY SITE IN HOLMES COUNTY, OHIO

A mastodon was discovered in 1938 by a farmer cutting a shallow drainage ditch. Eight teeth and a thigh bone were recovered. Further excavation was not attempted. In the summer of 1993 undisturbed portions of the site were excavated by students from the University of Akron. Bones of the disarticulated skeleton were scattered over an area of 50 square meters. Among the bones were six medium-size flint flakes and two crude flint tools.

*Bryson, R. (See Bryson, R.U.)* [83]

*Bryson, Robert U. (INFOTEC Research) and Reid A. Bryson (Wisconsin-Madison)*

[83] A COMPARISON OF CULTURAL EVIDENCE AND SIMULATED HOLOCENE CLIMATES OF THE PACIFIC NORTHWEST

Hunter-gatherer land-use strategies represent the articulation of a cultural system with an ecosystem. The resource base upon which a particular strategy depends is strongly influenced by changes in local climate through time and across geographic space. Local paleoclimates were simulated using a hierarchical macro-physical model (extended to account for local topography) relying on calculated glacial area, insolation, and modulation of insolation. The archaeological record for several well-documented sites is compared with simulations of the local climate.

*Buck, Paul E. (Desert Research Institute) and Anne DuBarton (Desert Research Institute)*

[75] A PRELIMINARY REPORT ON THE RESULTS OF THE 1963-64 FIELD SEASON AT PINTWATER CAVE IN SOUTHERN NEVADA

Pintwater Cave, a large cave 50 miles northwest of Las Vegas containing dry stratified deposits and abundant organic artifacts, was tested in 1963/64 by archaeologists from the Nevada State Museum and UCLA. A collection of approximately 2000 artifacts was made which has just been inventoried and analyzed. The archaeological materials have <sup>14</sup>C dates ranging from 9200-3200 B.P. Points from the cave include Pinto, Elko, and Gypsum Cave varieties, some evidently reworked while still hafted. More than 100 arrow and dart shaft fragments were recovered, some with decoration, flitching, or remnant stone points. The collection also includes packrat midden samples and faunal remains.

*Buckland, P. (See McGovern, T.)* [46]

*Buikstra, Jane (Chicago)* [Discussant 106]

*Bullock, Peter (Museum of New Mexico)*

[19] IS OLD ALWAYS HISTORIC? THE GLENCOE INCINERATOR SITE

Early 20th century industrial sites present unique archaeological problems. The sites are old enough to be considered historic, but young enough to be perceived as recent. The sites are readily demolished and their related documents are readily discarded. These sites fit the 50 year rule, but are they actually worth an excavation? Is documentation enough? Should historic preservation laws be strictly applied to these sites? One 20th century industrial site, the Glencoe Village Incinerator located near Chicago, Illinois, is examined. Problems are described and solutions shared. Official cooperation and persistence in uncovering new sources of documentation are considered top priorities.

*Burger, R. (See Glascock, M.)* [19]

*Burger, Richard (Yale University)*

[15] INITIAL PERIOD COPPER METALLURGY ON THE CENTRAL COAST OF PERU

Recent excavations at the Initial Period site of Mina Perdida in the Lurin Valley have yielded evidence of small fragments of thin copper sheet dating to approximately 110 B.C. These fragments constitute the oldest known case of copper working in Peru. Preliminary SEM analyses suggest that the metal is probably native copper and studies of the specimen's microstructure indicate that the cut and hammered metal foil was annealed. The antiquity and archaeological context of this find have interesting implications for modeling the early development of metallurgy in the Central Andes.

*Burgess, R. (See Hoffecker, J.)* [94]

*Burney, David A. (Fordham University)*

[79] THE CONSEQUENCES OF HUMAN ARRIVAL IN MADAGASCAR, PUERTO RICO, AND THE HAWAIIAN ISLANDS

Inter-island paleoecological comparisons have provided useful information concerning the role of human vs. background-level disturbance in tropical ecosystems. Although prehuman vegetation changes and disturbance regimes are well-documented, major ecological changes have occurred since human arrival in Madagascar, Puerto Rico, and the Hawaiian Islands. Instructive inter-island differences have been detected in the

chronology, distribution, and extent of human activities, vegetation changes, and biotic extinctions. The decline of endemic faunas following human arrival appears to be a common feature of these and many other tropical oceanic island histories, with habitat modification, over-hunting, and exotic species invasions as likely causes.

**Burton, James (Wisconsin)**

**[54] BARIUM AND STRONTIUM**

Bone levels of barium and strontium reflect dietary Ba/Ca and Sr/Ca ratios. Barium levels reflect the dietary ratio of marine to terrestrial resources, and both elements exhibit trophic level effects. However, intrinsic variability, environmental effects, post-depositional contamination, and other factors also significantly affect bone levels of these elements. Barium and strontium data cannot be correlated with diet without an assessment of these effects. Barium and strontium have problematic potential, but this is not the case for other elements. The archaeological literature notwithstanding, use of other elemental abundances as paleodietary indicators should not be attempted.

**Burton, J. (see Simon, A.) [42]**

**Burton, James H. (Wisconsin-Madison), Arleyn W. Simon (Arizona State), and David R. Abbott (Arizona State)**

**[42] INTERREGIONAL CONNECTIONS IN THE DEVELOPMENT AND DISTRIBUTION OF SALADO POLYCHROMES IN CENTRAL ARIZONA**

Gila polychromes are associated with Salado sites across much of the Southwest, but the distribution of these decorated vessels is variable. Although multiple production centers are recognized for these vessels, their roles in the interregional social networks are still open to interpretation. Recent detailed compositional studies provide a backdrop of locally produced wares against which the characterization of Gila Polychromes can be compared. Data from several adjacent study regions are used to assess the development and distributions of Pinto, Gila, and Tonto Polychrome. The domestic and special social roles of these decorated vessels as part of an interregional network of exchange and communication are examined.

**Butler, B. (see Ambrose, S.) [54]**

**Butler, Brian M. (Southern Illinois)**

**[94] PALEOENVIRONMENT, EARLY SETTLEMENT, AND THE ARCHAEOLOGICAL RECORD OF THE MARIANA ISLANDS**

Archaeologists in Micronesia have begun to move beyond time-space systematics and site description to look at paleoenvironments and the complex relationships of those environments to human settlement in these islands. Recent work on the west coast of Saipan provides examples of the complexities of the archaeological record of early settlement in the Mariana Islands from 3500-3000 B.P. This work documents significant changes in coastal land form and environments since initial human settlement and makes clear that the record of the earliest occupations on the island has been greatly impacted by shoreline changes.

**Butler, Virginia (Colorado) and James C. Chatters (North American Paleoscience)**

**[17] ON THE IMPORTANCE OF BONE DENSITY IN STRUCTURING PREHISTORIC SALMON BONE ASSEMBLAGES (1993 Winning Poster, Professional/Non-student Category)**

Archaeologists working in the Pacific Northwest often suggest the low frequency of salmon cranial elements and abundance of vertebrae in prehistoric deposits reflects the cultural use of stored fish. While empirical documentation of salmon storage is certainly important, analysts must consider the role of bone density in accounting for body part frequencies. Bone densities of representative cranial and postcranial elements from ten chinook salmon (*Oncorhynchus tshawytscha*) skeletons were measured using X-ray absorptiometry. The role of bone density in structuring prehistoric salmon assemblages is explored through comparisons of density measures with element survivorships obtained from several coastal and inland Plateau sites.

**Butler, Virginia L. (Colorado) and Christopher F. Waybomus (U.S. Geological Survey)**

**[97] RECENT FIELD INVESTIGATIONS AT THE DALLES ROADCUT, COLUMBIA RIVER, OREGON**

Originally excavated in the 1950s, the 9500-7600 year old salmonid remains from The Dalles Roadcut site have provided the most compelling evidence for early Holocene fishing in the Pacific Northwest. Questions about the cultural origins of the fish remains motivated further field investigation, May-June 1993. Sedimentological attributes (deposit shape, particle size and shape) indicate erosion processes largely are responsible for the sediments encasing the fish remains in the upper levels. Implications of these findings to the question of fish bone origin are explored.

**Butzer, Karl W. (Texas-Austin)**

**[39] PEOPLE AND THE LAND: ECOLOGY IN THE LONG VIEW**

Recent limnological work in Central Mexico shows that indigenous land use provoked episodes of soil erosion as early as 1900 B.C., and that soil destruction peaked during the 3 centuries prior to the Spanish

Conquest. Erosion did *not* increase during the first 250 years of the Colonial era. This corroborates massive archival evidence that initial Colonial land use did not lead to ecological deterioration. We must now move from presupposition to empirical monitoring of long-term, land use histories: Latin Americanists have casually oversimplified, even misrepresented the role of traditional agropastoral systems of Old World origin in the New, introducing false assumptions into archaeological models. To the contrary, some 3 dozen long-term palynological records from around the Mediterranean Basin demonstrate that traditional agropastoral land use across 8 millennia has generally been conservative and ecologically adaptive, with managed grazing, by means of controlled use of fire, since 4000 B.C. Ecosystems are the product of millennia of co-evolution between the environment and human activities. The complexity of ecological issues facing society today demands expanded inter-disciplinary interaction. Archaeologists are uniquely equipped to document and model long-term settlement and land-use histories.

**Buyce, R. (see Adovasio, J.) [69]**

**Buyce, R. (see Velichko, A.) [69]**

**Byland, Bruce (Lehman College & Graduate Center, CUNY)**

**[55] IDEOLOGY AND THE INTERREGIONAL DEFINITION OF POWER IN POSTCLASSIC OAXACA**

The leaders of ancient Oaxacan polities were able to manipulate a complex ideological landscape to suit their changing political motives. The compartmentalization of supernatural power among the independent states of Postclassic Oaxaca made possible the justification of war as well as the building of enduring peace. This paper will examine some iconographic evidence for religious compartmentalization as well as the ideological basis for the definition of political relationships between polities of the Mixteca Alta and the Valley of Oaxaca in the Postclassic.

**Byram, R. Scott (Oregon) and Mark Tveskov (Oregon)**

**[35] WOOD STAKE FISHING WEIR SITES ON THE OREGON COAST**

Ethnographic literature indicates salmon fishing was a key subsistence practice among southern Northwest Coast cultures, but to date there have been few archaeological correlates to this activity. Recent archaeological surveys of estuaries on the Oregon coast have located 15 wet sites containing remains of fishing weirs. These sites are providing substantial data regarding subsistence and technology on the Oregon coast. The fishing weirs are located on intertidal mud flats along the shores of estuaries. These features consist of linear arrangements of vertical wooden stakes which are often accompanied by horizontal wooden elements, and in some cases, stone net sinkers and woven lattice of wood and cedar bark cordage. Limited radiocarbon dating of these features indicates they were used during late prehistoric and early historic times. Three basic weir configurations have been defined, and these are considered in terms of functional weir types described in the ethnographic literature of the region.

**Byrd, B. (see Collins, R.) [88]**

**Cabrera, Oralia (Escuela Nacional de Antropología)**

**[30] LAPIDARY ARTIFACT PRODUCTION AT TEOTIHUACAN**

Recent excavations at the Pyramid of the Feathered Serpent, Teotihuacan, have exposed a large number of sacrificial burials, most associated with elaborate offerings. An analysis of lapidary techniques employed in the manufacture of artifacts of jadeite, serpentine, and other precious and non-local stone, as well as their form and stylistic attributes, is currently underway. A comparison of these offerings with similar objects produced by specialists working in other materials (primarily obsidian and ceramics) is providing new insights into the nature of craft production at Teotihuacan.

**Cachora, Lorey (Quechan Indian Tribe)**

**[86] LEGENDS OF THE YUMA-SPEAKING PEOPLES: LOWER COLORADO RIVER BETWEEN CALIFORNIA AND ARIZONA**

Principal legends of the Quechan and Mojave peoples, such as the creation epic and the great migrations, are associated with known localities along the lower Colorado River and neighboring deserts. Prominent in all legends is the place of the Creation beginning at Spirit Mountain, or Avikwame, located north and west of Laughling, Nevada. Reference is made to many sites where archaeological remains are present. This discussion exemplifies the need for integrating ethnology and the archaeological record in the reconstruction of past human adaptations in this region.

**Cameron, Judi (Arizona State)**

**[98] DIFFERENCES IN FAUNAL UTILIZATION AT LARGE AND SMALL HABITATION SITES IN THE TONTO BASIN, ARIZONA**

Shifts in population from small dispersed communities to larger aggregated settlements have been documented throughout the North American Southwest. These shifts affected social and economic organization, including subsistence strategies. Analyses of faunal remains from large and small habitation sites in the Tonto



Basin of Arizona show that faunal utilization in general, and artiodactyl use in particular, is greater at the larger settlements. This implies a shift in procurement strategies as the primary habitat for artiodactyls is in the uplands surrounding the basin. Economic, social, and ceremonial explanations for increased faunal use at larger settlements are addressed in this paper.

*Camilli, E. (see Cassell, M.)* [35]

*Canaday, T. (see Price, B.)* [83]

*Caneva, Isabella (University di Roma)*

[4] EARLY SETTLEMENT SITES OF THE EASTERN TAURUS: A CONTRIBUTION FROM THE AREAS OF ÇAYÖNÜ AND MERSIN

Recent research in the Ergani plain, at the southeastern fringes of the Taurus, has provided new data on the ancient settlement pattern and cultural continuity of the region. Test excavations were made seeking occupations that continued the cultural sequence of Çayönü. A continuation during the 6th millennium B.C. is seen in a stratified contiguous site which shows links with the Levantine contemporary ceramic cultures. A parallel sequence of early ceramic cultures at Mersin, south of the Taurus, is now being re-examined. It shows features better related to central Anatolia and may provide a more articulated perspective of these early periods.

*Cannon, Kenneth P. (Midwest Archaeological Center-National Park Service) and Richard E. Hughes (Geochemical Research Laboratory)*

[105] EMERGING PATTERNS OF OBSIDIAN UTILIZATION IN YELLOWSTONE NATIONAL PARK

Although obsidian characterization studies have been prosecuted in the Yellowstone vicinity for nearly three decades the results, based on relatively small samples, indicated that only local sources were used. Recent studies have increased the sample size and support a new view of past obsidian exploitation. Contrary to previous work, our studies identified utilization of at least seven chemically distinct geologic sources (some over 280 km from Yellowstone), the use of which varied in frequency over the past 10,000 years. We discuss the patterning in these obsidian data insofar as they bear on models of regional settlement and lithic resource utilization.

*Carlyle, S. (see O'Rourke, D.)* [90]

*Carpenter, John (Arizona)*

[7] THE CAHITAN CONNECTION: MODELING MESOAMERICAN INTERACTION IN THE GRAN CHICHIMECA

Explaining the material and ideological components of Mesoamerican origin found within northern Mexico and the American Southwest has long been the source of archaeological intrigue and theoretical speculation. A significant aspect of many of these models is concerned with bridging what is often characterized as an intervening cultural "netherworld." Linguistic, ethnographic and archaeological data from Sinaloa and Sonora suggest that prehispanic Cahitan-speaking peoples occupied both a spatially and culturally intermediate position, and provided a continuous link between Mesoamerica/West Mexico and the international border.

*Carr, Christopher (Arizona State)*

[51] A CROSSCULTURAL SURVEY OF THE IDEATIONAL AND SOCIAL DETERMINANTS OF MORTUARY PRACTICES

A Human Relations Area Files survey of ideational, social organizational and other determinants of mortuary practices was made for 31 societies, world-wide. Specific mortuary variables that are most useful for reconstructing specific aspects of ideation and specific dimensions of social organization are identified. Ideational factors were observed as frequently as social factors to determine mortuary practices, generally, but shift in balance with social complexity. Common hypotheses in mortuary archaeology for reconstructing social organization are tested. Strong support is found for Hertz's hypothesis, that some mortuary practices are social attempts to manipulate the state of the soul of the deceased.

*Carr, Kurt (Pennsylvania Historical and Museum Commission), C.L. Pedler (Mercyhurst College), and D.C. Dirkmaat (Mercyhurst College)*

[69] MATERIAL CULTURE STUDIES AT MEZHIRICH, 1993

The material culture of the late Upper Pleistocene inhabitants of Mezhirich was rich in sheer numbers of items, diverse in exploited raw materials, and quite distinctive both in terms of products as well as manufacturing processes. This contribution explores the lithic technology of the site in terms of reduction strategies, tool categories, lithic procurement, and tool-use. The use of non-local exotics (i.e., amber and "gagat") and the manufacture of non-durable and rarely recovered items (e.g., cordage) are also discussed.

*Carroll, Mary S. (CAP Repository) and Dale R. Gerken*

[63] INFORMATION MANAGEMENT IN ARCHAEOLOGY: A BROADER PERSPECTIVE

Computerization of databases utilized in archaeological field projects and repositories is common-place today. The design of field and lab databases can have long-term effects at the repository, both positive and

negative. The system used by the Central Arizona Project Repository will be discussed in terms of the integration of the information needs of archaeological projects with those of archaeological repositories. Some of the issues to be addressed in this paper include planning and design of computerized systems, data standardization, data redundancy, long-term usability of data, and field/lab approaches to computerization versus repository approaches to computerization.

*Carter, Brinnen (Florida Museum of Natural History)*

[35] THE EARLIEST HOLOCENE RECORD ON THE PAGE/LADSON SITE (8JE591), AUCILLA RIVER, FLORIDA

The Bolen age strata of the Aucilla River, Florida, yield a rich variety of cultural and non-cultural organic and inorganic remains. Ongoing work at the Page/Ladson site (8JE591) has yielded an inundated occupation layer radiocarbon dated to circa 10,000 years B.P. The Bolen period stratum is characterized by a highly compacted, organic soil that has chert, bone, and wooden artifacts perched on its upper surface. Wooden stakes penetrate the entire layer. The presence of charcoal, grey limestone, and stakes with charred ends suggests an occupation site. A site plan and an analysis of recovered artifacts will be presented.

*Cassell, Mark S. (SUNY-Binghamton) Albert A. Dekin, Jr. (SUNY-Binghamton), Eileen Camilli, and Janet Kerley*

[35] THE EXXON VALDEZ OIL SPILL ARCHAEOLOGICAL DAMAGE ASSESSMENT PROJECT

In 1991, Binghamton University was contracted by the USDA-Forest Service to conduct investigations into potential physical and chemical injuries to cultural resources which were attributable to the 1989 Exxon Valdez oil spill and subsequent cleanup efforts in the Gulf of Alaska. The research found no evidence directly linking the oil spill with identified injuries to archaeological resources at the locations examined by the project. Nonetheless, the injury data gathered was invaluable for better understanding recognized ongoing sources of natural disturbance (e.g., erosion); previously unrecognized sources of human disturbances (e.g., petroleum hydrocarbons from watercraft); and ongoing, long-term human land use at specific resource-rich locales.

*Cassman, Vicki (Arizona State) and Bernardo Arriaza (Nevada-Las Vegas)*

[22] TOWARD A DEFINITION OF CHINCHORRO

The Chinchorro culture is relatively unknown to most anthropologists and archaeologists despite the early dates, and their unique complex artificial mummification practices. This is partially due to the sporadic nature of past studies and the publication of findings and commentary in lesser known, or local South American journals. International interest in the Chinchorro problem has increased substantially in the last year as scholars from various disciplines have begun to piece together the role of the Chinchorro in Andean Prehistory.

*Castillo, Luis Jaime (California-Los Angeles)*

[77] THE MOCHE STATES OF NORTHERN PERU: SOCIO-POLITICAL STRUCTURES AND POWER STRATEGIES

The Moche of northern Peru did not constitute a single, unified political structure, but a number of independent entities that followed different developmental sequences. In this paper I examine the social and political structures of the different Moche states during the transition between the Early Intermediate and the Middle Horizon Periods. Two aspects that will be central to my discussion are the emphasis given by Moche elites in their power strategy to the ideological realm, and to exchange contacts with the Wari derived societies of the central coast. I will argue that these two aspects contributed both to the demise of the Moche, and to the origin of societies that follow in the north coast.

*Cerrato, R. (see Bernstein, D.)* [92]

*Chadwick, Tara*

[93] ARCHAEOLOGY: JUST ANOTHER FORM OF COLONIALISM? A LOOK AT ARCHAEOLOGY IN BELIZE

This paper will address the topic of archaeology as a force of colonialism in the country of Belize, where excavations are directed primarily by foreigners from Canada, England, or "The States." Archaeologists digging up other peoples' cultural remains must consider the effects of their presence in the modern community. We also need to continually re-examine the benefits of archaeological investigation and weigh these against the costs that our work incurs.

*Chambers, Karen (Pennsylvania State) and James R. Purdue (Illinois State Museum)*

[35] GENETICS OF PAST POPULATIONS: THE ANALYSIS OF mtDNA FROM ARCHAEOLOGICAL BISON

Bison herd size and distribution from the late Pleistocene throughout the Holocene are considered critical factors in interpretations of early human subsistence strategies in the New World. We extracted DNA from

both extant bison and from bison skeletal remains from bone bed sites of varying ages including Glenrock in Wyoming, Big Bone Lick in Kentucky and Hudson-Meng in Nebraska. Variation within the hypervariable D-loop region of the mitochondrial genome is examined for evidence of population depletion or expansion.

*Chartkoff, Joseph (Michigan State)*

[11] EXCHANGE SYSTEMS AND SOCIOPOLITICAL COMPLEXITY IN THE CENTRAL SIERRAS: THE IMPACT OF COASTAL COLONIZATION ON INLAND COMMUNITIES

Carrying capacity, in terms of population size, density and organizational complexity, is affected by flows of matter and energy between systems as well as circulation within systems. For the Sierra Miwok, participation in regional exchange allowed them to out populate and competitively displace their Proto-Yurok predecessors while achieving degrees of sociopolitical complexity that peaked by A.D. 1700. Later colonization of the coast by Spain eliminated some key Miwok exchange partners as well as their monetary system, producing declines in complexity and density to ethnographically-known levels.

*Chase, Diane (Central Florida)*

[106] SOUTHERN LOWLAND MAYA ARCHAEOLOGY AND HUMAN SKELETAL REMAINS: INTERPRETATIONS FROM CARACOL (BELIZE), TAYASAL (GUATEMALA), AND SANTA RITA COROZAL (BELIZE)

Skeletal samples from Caracol, Santa Rita Corozal, and Tayasal permit the construction of separate paleodemographic reconstructions. These samples, when placed within their archaeological context, allow diachronic comparison of the prehistoric Maya in three different locations—inland, coastal, and lacustrine. This paper has three goals. First, it compares and contrasts paleodemographic patterns in different parts of the Southern lowlands. Second, it examines the relationship between burial recovery and settlement pattern population density estimates. And third, it looks at the clustering of paleopathological traits and skeletal modifications in terms of their archaeological interpretation, particularly with regard to status and/or genetic relationships.

*Chatters, J.C. (see Butler, V.) [17]*

*Cheetham, David (Belize Valley Archaeological Reconnaissance Project)*

[76] ANCIENT ROADWAYS, ELITE RITUAL AND SETTLEMENT PATTERNS OF THE MAYA: RECENT EVIDENCE FROM CAHAL PECH, CAYO, BELIZE

Recent investigations within the periphery of Cahal Pech, Cayo, Belize have demonstrated Classic Period ties between specialized ceremonial/architectural groupings and sociopolitical power as manifest in warfare and elite ritual. Evidence includes two elaborate vaulted tombs (ca. 600 A.D.) within a pyramidal structure at the terminus of a causeway, or sacbe. Tomb contents include an elite burial with iconographic evidence of warfare and a "stela tomb" containing a carved monument as the primary interment.

*Childs, S. Terry (Smithsonian Institution)*

[12] HAMMERING OUT THE SOCIO-POLITICAL DYNAMICS OF IRON-WORKING IN CENTRAL AFRICA

The relationships between the production of iron and the social, political, and religious contexts in which it has developed over the last 1500 years in Central Africa are intimate and complex. This paper examines these intricate relationships among the Luba peoples and their predecessors in southeastern Zaire by focusing on the use and meaning of the anvil. This object is the most important tool for iron forging and a key symbol of the political authority and spiritual power that affects all aspects of Luba social life.

*Chilton, Elizabeth S. (Massachusetts-Amherst)*

[96] CONFRONTING COMPLEXITY: MATERIAL CULTURE IN HISTORICAL CONTEXT

By imposing order on the infinitely complex material world, archaeologists facilitate communication between professionals and gain a sense of control over the past. However, the rigid utilization of nominal variables, or types, can mask complexity and historical processes. In New England, Late Woodland cultures (1000-1500 AD) are poorly understood; the typological approach seriously limits understanding of both artifact and cultural variability. An attribute analysis, utilizing continuous variables and category grading, offers a more dynamic alternative. In this study, an attribute analysis on ceramics from the Middle Connecticut River Valley provides a way to confront multiformity, and allows for a more active history of Native peoples.

*Chimonas, Susan (Michigan)*

[8] THE OCCUPATIONAL HISTORY OF PREHISPANIC XALTOCAN, MEXICO

Intensive surface collection at Xaltocan, Mexico, provides a strong base for the reconstruction of the site's occupational history. Changes in ceramic frequency distributions from Early to Late Aztec times indicate changes in Xaltocan's population size and internal organization as the town came under the control of the Aztec state. This information, in turn, provides a basis for understanding the political, social, and

economic consequences of Aztec political unification upon this previously autonomous settlement in the northern Basin of Mexico.

*Chippendale, Christopher (Cambridge University) and David Pendergast (Royal Ontario Museum)*

[38] ETHICS, KNOWLEDGE AND PUBLICATION

The Society's working groups has taken its view on ethics from the premiss that the archaeological record is a common good held in public trust. The same goes for the written and unwritten knowledge that researchers develop from those physical materials, which again should be in the public domain. The special cases are addressed where the public trust requires knowledge to be kept hidden (e.g., locations of sites at risk if their whereabouts is known). The special conditions are also addressed when private interests, of the researcher or another, may for a time reserve knowledge from the public domain.

*Cinquino, M. (see Hayward, M.) [102]*

*Ciolek-Torrello, Richard (Statistical Research, Inc.) and Stephanie M. Whittlesey (Statistical Research, Inc.)*

[7] THE DEVELOPMENT OF FORMATIVE CULTURE IN SOUTHERN ARIZONA

Previously accepted views posit that the Hohokam, early Mesoamerican migrants, were the source of village life in this region. Within the last decade, however, the discovery of a series of sites dating to the first centuries A.D. and a recent shortening of the Hohokam chronology reveal that sedentary, agricultural, and ceramic-producing villages predated the appearance of the distinctive Hohokam culture. Comparison of early subsistence patterns, architecture, and additional aspects of material culture with other regions of the Southwest suggest the existence of an early pan-Southwestern culture. This conception raises questions about the ontogeny of later Formative cultures in the Southwest.

*Clark, G. (see Barton, C.) [27]*

*Clark, Geoffrey A. (Arizona State)*

[2] CONCEPTUAL ISSUES BEARING ON MODERN HUMAN ORIGINS IN THE LEVANT AND WESTERN ASIA

Controversy surrounding the biological and cultural origins of modern humans in the Levant and western Asia illustrates the effects of paradigm bias in our efforts to make sense of the human past. The debate is re-examined by focusing on conceptual issues in evolutionary biology. It is argued that, until paleo-anthropologists confront the inferential bases for their knowledge claims, there is no prospect of resolving any significant question in human origins research.

*Clark, J. (see Blake, M.) [59]*

*Clark, J. (see Craig, D.) [26]*

*Clark, J. (see Jabren, H.) [25]*

*Clark, Jeffrey (North Dakota State) and Elizabeth Wright (School of the Arts Institute-Chicago)*

[6] INTERACTIONS WITHIN AND BEYOND THE SAMOAN ARCHIPELAGO: EVIDENCE FROM BASALT AND VOLCANIC GLASS GEOCHEMISTRY

The islands of Samoa are critically important for understanding the prehistory of the Central Pacific. It has long been known that pre-historic Samoans had long-term socioeconomic interactions with the inhabitants of Tonga and Fiji. Only recently, however, have studies of basalt and volcanic glass geochemistry begun to reveal the antiquity, nature, and extent of those interactions. This paper summarizes the prehistoric interactions within the Samoan group and between Samoa and other archipelagos, as revealed through geochemical studies. Special attention is given to the role of Tutuila, in American Samoa, as a source for basalt and volcanic glass.

*Clark, John (Brigham Young University) and Rob Fergus (Brigham Young University)*

[81] EARLY FORMATIVE COMMUNITIES AT PASO DE LA AMADA, CHIÁPAS, MEXICO

A cross-cultural study of buildings in non-stratified communities suggests a range of criteria for identifying the function(s) of special buildings, thereby providing a key for interpreting ancient community organization. These criteria are used to evaluate especially large structures at the Early Formative community of Paso de la Amada, Chiapas, Mexico, and to determine probable community organization at different periods of time. Diachronic analysis demonstrates increasing integration through time.

*Clark, Mary (Southern Methodist University)*

[73] PRELIMINARY INVESTIGATIONS OF LATE STONE AGE AND METALLURGIC SITES ALONG SUB SAHARAN PALAEOCHANNELS IN SENEGAL AND MALI

Sub Saharan palaeochannels served as important corridors for movement between the Senegal and Niger River valleys during historic times. Of interest is their role in Late Stone Age (LSA) adaptations—specifically,



whether they served as periodic migratory routes for LSA populations shifting north and south in response to climatic oscillations during the 2nd millennium B.C., or as continuously occupied landscapes reflecting an ongoing flux of populations central to state formation in the middle and late 1st millennium A.D. A survey was conducted along these unexplored palaeochannels to ascertain the nature and distribution of LSA and Metallurgic sites allowing for a preliminary test of ideas concerning their role in LSA adaptations.

*Clarkson, Persis (Winnipeg)* [Discussant 86]

*Close, Angela E. (Southern Methodist University)*

[45] **ARCHAEOLOGY OF THE PLEISTOCENE-HOLOCENE TRANSITION IN NORTHEASTERN AFRICA.**

At the end of the Pleistocene, the Nile ceased aggrading and downcut into a deep channel. The reduction in the floodplain disrupted earlier, broad-based subsistence patterns, which focused upon wetland plants (especially tubers) and seasonal fish-harvests. Early Holocene Nilotic sites are much smaller and rarer than those of the Late Pleistocene. Simultaneously, the monsoon-belt moved northward and, after some time-lag, the Sahara was colonized by gatherer-hunters, herding cattle as a dietary failsafe and supplement (milk). By 8000 B.P., Saharan groups were intensively collecting a wide range of Sahelian plants, including sorghum and millets later domesticated in Africa.

*Cobos, Rafael (Tulane University)*

[29] **CHICHÉN ITZÁ AND SOUTHEASTERN MESOAMERICA BETWEEN A.D. 900-A.D. 1200: A VIEW FROM EL SALVADOR**

A review of non-local archaeological materials found at Chichén Itzá is presented before considering the contacts that Chichén had with Southeastern Mesoamerica during the Terminal Classic period. The region of El Salvador is seen as an intermediate point between Central America and the Maya Lowlands.

*Cogswell, James (Missouri University Research Reactor), Michael J. O'Brien (Missouri), Robert C. Mainfort, Jr. (Memphis State), Hector Neff (Missouri), and Michael D. Glascock (Missouri)*

[78] **NEUTRON-ACTIVATION ANALYSIS OF CAMPBELL APPLIQUÉ POTTERY FROM SOUTHEASTERN MISSOURI AND WESTERN TENNESSEE: IMPLICATIONS FOR LATE MISSISSIPPIAN INTER-SITE RELATIONS**

Campbell appliqué pottery is a late Mississippian-period marker type for archaeological sites in southeastern Missouri. Recent discoveries of this type in western Tennessee have raised the question of whether production centers of Campbell appliqué were geographically limited or were dispersed across the central Mississippi River valley area. Stylistic and metrical analyses to date have not found consistent interassemblage variation. Chemical analyses based on neutron-activation analysis conducted at the Missouri University Research Reactor will provide evidence on the nature of pottery-related contact among these sites.

*Coinman, Nancy (Iowa State)*

[20] **WORKED BONE IN THE LEVANTINE UPPER PALEOLITHIC: RARE EXAMPLES FROM THE WADI HASA, JORDAN**

Although worked bone is common and typical of the material culture of the European Upper Paleolithic, it is extremely rare in Upper Paleolithic sites in the Levant. Four examples of worked bone were recovered from the late Ahmarian component of site WHS 618 in the Wadi Hasa, west-central Jordan, dated at ca. 20,300 B.P. Two examples are identical to those recovered in Upper Paleolithic deposits at Ksar Akil in Lebanon. The bone artifacts are illustrated and discussed in terms of preservation factors, the technology they represent, and the potential role of such rare items in the Levantine Upper Paleolithic.

*Collins, Ronald (Kent State) and Bill Byrd (Kent State)*

[88] **MORPHOLOGY, FUNCTION, AND USE LIFE: AN EVALUATION OF THE PALEO CROSSING ENDSCRAPER ASSEMBLAGE**

An assemblage of complete Paleoindian endscrapers ( $n = 122$ ) from the Paleo Crossing Site (33Me274), Medina County, Ohio is examined. A suite of linear, angular and polar metrics quantifies attributes of morphology, function and macroscopic use wear. A principle components analysis is utilized to describe the variation within the assemblage. Cluster analysis is used to partition variation to create a functional typology based on geometric distances within and between attribute clusters. Behavioral explanations which account for variation and attribute clustering in this assemblage are advanced.

*Colten, Roger (Fowler Museum)*

[61] **ANIMAL RESOURCES, EMERGENT COMPLEXITY, AND THE ARCHAEOLOGICAL RECORD**

This paper is an exploration of changing patterns of animal procurement, processing and distribution in a prehistoric hunting, gathering and fishing society at the emergence of complexity on Santa Cruz Island, California. The importance of fish increased while the importance of shellfish and marine mammals decreased

through time. Exchange in seal meat, sea otter hides, deer bone, and dogs increased through time. The density of animal procurement artifacts decreased while the density of craft production debris increased implying an inverse relationship between craft activities and animal procurement.

*Coltrain, Joan Brenner (Utah)*

[90] **THE GREAT SALT LAKE WETLANDS: A STUDY IN PREHISTORIC DIET**

Great Basin archaeologists have long debated the role of corn agriculture in prehistoric economies. The importance of corn in eastern Basin wetlands habitats has been of particular interest. Although traditional approaches to dietary reconstruction have been unable to resolve this issue, stable carbon isotope analysis of human bone collagen is ideally suited to assessing the role of corn versus native resources. Here I report results from a stable isotope study of Great Salt Wetlands burials. Data obtained suggest that both the importance and timing of corn agriculture in the study area may have been incorrectly estimated and warrant further study.

*Coltrain, Joan Brenner (Utah) and Thomas W. Stafford, Jr. (Colorado-Boulder)*

[54] **AMINO ACID STABLE ISOTOPES AND ANCIENT DIET: A PRELIMINARY REPORT**

Despite wide use of stable carbon isotope analysis of total bone collagen, its utility is limited to distinguishing between two broad categories of resources, those that employ a  $C_3$  versus a  $C_4$  photosynthetic pathway. The dietary contribution of resources using the same photosynthetic pathway cannot be determined with conventional procedures. Recent research indicates that molecular level isotope analysis holds promise for identifying and quantifying consumption of resources with common photosynthetic regimes. Here we report preliminary results from stable isotope analysis of selected amino acids isolated from human skeletal remains. We also assess the potential of this procedure for furthering our understanding of prehistoric subsistence practices.

*Conkey, Margaret (California-Berkeley)* [Forum Participant 13]

*Conkey, Margaret (California-Berkeley)*

[40] **BEYOND DECONSTRUCTION: WHAT DO WE WANT IN OUR VISUAL IMAGERY?**

While the study of the visual language of archaeology is quite new, the work so far has revealed that much imagery embodies a variety of social, political, and historical positionings and biases that are deeply problematic. The deconstructions of our visual discourse have not been simplistic but the inevitable question arises as to what the alternatives are and how do we effect them, especially without merely reproducing our own contemporary positions. This paper explores the alternatives for the visual language and reconstructions that center on the doubly visual topic of Paleolithic art.

*Conkey, Margaret (California-Berkeley)*

[2] **COMING TO TERMS WITH SYMBOLISM: RE-VISIONING LATE PLEISTOCENE ARCHAEOLOGY**

Paleo-archaeology continues to be concerned with the evolution of human symbolic behavior but the precise terms and concepts employed are not often dealt with explicitly. We are now able to review critically not just the terms we use but the kinds of analyses and interpretations that such terms implicate. As well, there are now interesting new ideas about the "timing" of the appearances of anatomically-modern humans in different parts of the globe as well as about the evidence(s) for visual culture ("art"), which implies that a certain re-visioning of late Pleistocene times is at hand.

*Connolly, Robert P. (Illinois-Urbana) and Sue Ellen Kozarek (Gray and Pape, Inc.)*

[23] **MIDDLE WOODLAND EARTHWORKS ECONOMICS, TECHNOLOGY AND SETTLEMENTS: EVIDENCE FROM SURFACE COLLECTIONS**

Surface collections of lithic artifacts from the periphery of the Fort Ancient Site, a Middle Woodland (200 B.C.—A.D. 400) hilltop enclosure in Warren County, Ohio, demonstrate the inferential potential of surface archaeological data. The results of research from a 20 hectare area provide evidence for the existence of discrete prehistoric activities, including areas of habitation, lithic reduction, and ritual or specialized activity. In addition, inferences related to economic organization, technology, and raw material exploitation are advanced. The validity of conclusions drawn from the surface collections is assessed and compared to those based on material excavated from Fort Ancient itself.

*Conte, E. (see Rolett, B.)* [6]

*Conte, P. (see Sweeney, M.)* [100]

*Conyers, Lawrence (Colorado-Boulder)*

[32] **GEOARCHAEOLOGICAL INVESTIGATIONS OF THE RIVAS SITE, COSTA RICA**

Monumental architecture at the Rivas Site consists of large stone circles, semi-circles and causeways constructed from boulders and cobbles originally deposited as debris flow units within Holocene-age terrace fill deposits. Remnant ridge and swale topography preserved on the upper surface of the terrace deposits

was highly modified during construction. Two buried soil horizons 15-25 cm thick at the site are associated with two distinct periods of habitation. The earliest soil contains scattered ceramics but is not associated with stone architecture. The upper soil unit contains abundant ceramics associated with the monumental architecture. This upper soil unit is bifurcated within some stone circles by a distinct reddish-orange anthropogenic fill deposit.

*Cook, D. (see Havill, L.)* [106]

*Cook, Lauren J. (John Milner Associates)*

[62] "WHO'S WATCHING THE WATCHERS?" OR, SURVEILLANCE, DISCOURSE, FOUCAULT AND INDUSTRIAL ARCHAEOLOGY

Foucault's "archaeology" of surveillance is vital to the sociology and historical archaeology of institutions, including industrial enterprises. At first glance, surveillance appears as a class-based system of control. But if the frame of analysis is shifted, surveillance is visible among the coping strategies of all classes. Foucault's explication of discourse is also relevant. Historical and industrial archaeology may profit from treating material culture as an active element in social discourse, rather than as an end in itself, or as an encrustation of ideology. The intersection of surveillance and discourse is a fertile area of archaeological study, as examples illustrate.

*Cook, Patricia (Arizona)*

[10] LOWER LEVEL ELITE SPECIALIZATION AT CHAU HIIX

Recent excavations in a Terminal Classic/Postclassic residence group at Chau Hiix, Belize, indicate possible specialization in shell manufacture. The location of the Platform 25 group on the periphery of the main platform, which is dominated by the site's ceremonial center raises questions regarding the nature of elite specialization and the controversy over the existence of attached specialists. This paper will summarize preliminary excavation data, as well as discuss the presence and function of what are herein termed "lower level elites".

*Cooke, Richard G. (Smithsonian Tropical Research Institute)* [Discussant 32]

*Cooper, Doreen (National Park Service)*

[70] INTERPRETING ARCHAEOLOGY IN THE KLONDIKE

Klondike Gold Rush National Historic Park is restoring the Moore House, the first Euroamerican settlement in Skagway, as an interpretive center for the 1997 Klondike centennial. The planning process for the exhibits is well underway. Because this was the site of previously-published archaeological fieldwork, received additional fieldwork in 1993 and will be mitigated in 1994, results from archaeological testing are included in the public interpretation of this site. This paper discusses the opportunities, as well as the trials and tribulations, of including archaeology as part of the interpretation of this site for the thousands of visitors to the Park each year.

*Cooper, Laurel M. (Arizona)*

[36] SPATIAL SYNTAX OF CHACOESQUE "GREAT HOUSES"

Pueblo de Arroyo, Aztec Ruins, and other Chacoese sites are analyzed with the space syntax model developed by Hillier to examine the interactive relationships between space and society. Buildings channel human activity, and they serve to facilitate encounter and privacy in varying proportions. Access graphs, derived from floor plans and site maps, can be used in cross-temporal and cross-geographical comparisons. Together with previous work on the pithouse-pueblo transitions, Chetro Ketl, and Pueblo Alto, the poster considers whether "great houses" in and outside of Chaco Canyon have spatial as well as stylistic similarities.

*Corbett, Debra (U.S. Fish and Wildlife Service), Douglas Siegel-Causey (Nebraska), and Christine LeFevre (French National Museum of Natural History-Paris)*

[79] THE WESTERN ALEUTIANS: REEVALUATING THE ISOLATION HYPOTHESIS

Most American researchers view the Aleutian Islands as a cul-de-sac or appendix. After the ancestors of the Aleuts entered the Chain, they became isolated from outside influences, though some are admitted from the east, and the culture developed in isolation. This view holds that the western islands were even more isolated and lacked influences from even the eastern Aleutians. This paper examines the archaeological and historical evidence for inter-island contacts and western Aleut isolation. Recent excavations on Buldir Island in the western Aleutians provide an excellent case for addressing questions of isolation and culture contact. Though preliminary, our evidence suggests that people from different island groups were in regular, though not constant contact with each other.

*Corcoran, M. (see Nickens, P.)* [35]

*Cordell, Linda S. (Colorado)* [Discussant 58]

*Cordy, Ross (Hawaii State Historic Preservation Division)*

[100] HAWAIIAN SETTLEMENT PATTERNS IN TIMES OF CHANGING SOCIAL COMPLEXITY, 1770S-1820S: IMPLICATIONS FOR PREHISTORY

The pinnacle of hierarchical social complexity in Polynesia developed prehistorically in Hawaii and Tonga. In Hawaii, general models suggest the nature and trends of the organizational changes, dimensions (population growth, agricultural intensification and expansion) which covaried in some fashion with those changes, and proposed causal sequences. However, without more accurate dating, it is difficult to evaluate the diachronic, and thus causal, relations among the dimensions. This paper looks at major changes in complexity which occurred at or just after European contact in Hawaii and associated settlement patterns—a case with chronological control—to see what ramifications exist for prehistoric archaeological research.

*Cordy-Collins, Alana (San Diego)*

[77] AN EXAMINATION OF THE LAMBAYEQUE CULTURAL TRADITION FROM THE VANTAGE OF SAN JOSÉ DE MORO

Lambayeque culture (Sican) of the Peruvian northcoast has its temporal beginnings at the end of the Middle Horizon. Traditionally, Lambayeque has been viewed either as a "country cousin" of the powerful LIP Kingdom of Chimor, or as a cultural phenomenon primarily restricted to the valley of the same name. However, the 1991-1992 excavation seasons at San José de Moro (Jequetepeque Valley) suggest another interpretation: that Lambayeque is both a direct development of the older Moche culture, and—with specific exceptions—a continuation of that cultural tradition. Focus here is on continuities and discontinuities with the Moche culture.

*Corrales U., Francisco (National Museum of Costa Rica)*

[32] CURRÉ: ESTABLISHMENT AND DEVELOPMENT OF AN AGRICULTURAL COMMUNITY IN SOUTHERN COSTA RICA

Stratigraphic excavations at the Curré site provided data for the determination of a three phase occupation sequence from 1500 B.C. to 1500 A.D. The recovered ceramics (including the oldest known for the region), lithics, and organic remains indicate the appearance of a small farming community, circa 1500 B.C., that grew in size and internal complexity to become an important regional center, with an emphasis on maize cultivation, during the Late Period (A.D. 800-1500). Curré thus provides rare and important information on long term developmental processes as seen at a single site in Lower Central America.

*Costin, Cathy (California State-Northridge)*

[12] WEAVING TECHNOLOGY IN THE DOMESTIC AND POLITICAL ECONOMIES

Using cross-cultural data, this paper discusses the extent to which domestic skills were translated into politically valued production in several state societies, and the implications of this relative ability for type of participation in the political economy. I evaluate alternative technical means for distinguishing between domestic and wealth items, specifically analyzing intensification of labor using "domestic" technology as compared with the introduction of new, elaborate and/or restricted technologies to produce valuables.

*Cougill, George L. (Arizona State)* [Discussant 96]

*Cougill, George L. (Arizona State)*

[49] HOW MUCH IS ENOUGH?: EMPIRICAL BAYES AND OTHER WAYS OF COPING WITH FEW OR SMALL SURFACE COLLECTIONS

The Teotihuacan Mapping Project obtained about a million objects in 5000 surface collections. This abundance makes possible some robust statistical conclusions, some of which are presented as secure knowledge about associations among ceramic categories in the ancient city. The main topic, however, is investigation of effects of using fewer and/or smaller collections. How numerous and how large must collections be to achieve satisfactory accuracy, and how much does a simple kind of Empirical Bayes estimation help to offset small collection sizes? Results are useful for researchers who must deal with fewer and/or smaller collections than at Teotihuacan.

*Craig, Douglas B. (Northland Research, Inc.) and Jeffery J. Clark (Center for Desert Archaeology)*

[26] THE MEDDLER POINT PLATFORM MOUND COMPLEX: FUNCTIONAL AND SOCIAL CONSIDERATIONS

Located in the Tonto Basin of central Arizona, the Meddler Point platform mound complex is believed to have served a largely ceremonial, integrative function. The mound complex is surrounded by 12 residential compounds containing a total of about 45 rooms. It is estimated that a maximum of 100-150 people lived at the site between A.D. 1280 and 1300 when the platform mound complex was built. Although there is some evidence for social differentiation among the site's inhabitants, it is considered minimal at best. The implications of this are discussed, and a preliminary model of social organization at the site is presented.



*Creamer, Winifred (Northern Illinois University) and Lisa Renken (Field Museum of Natural History)*

**[58] BIG SITES, SMALL POPULATION: CERAMICS AND CONTEMPORANEITY OF PROTOHISTORIC PUEBLO VILLAGES IN THE NORTHERN RIO GRANDE**

Analysis of stratigraphic samples of ceramics from protohistoric sites in the northern Rio Grande region can help establish which Pueblo villages were contemporaneously occupied during the fifteenth, sixteenth, and seventeenth centuries. It has been assumed previously that most of the 65 known protohistoric Pueblo villages were occupied continuously between approximately A.D. 1450 and 1680. Detailed ceramic analysis by the authors shows this is not the case. Cost effective methods of assessing the duration and extent of protohistoric villages are discussed.

*Crotty, Helen (California-Los Angeles)*

**[58] EAST MEETS WEST AT POTTERY MOUND: MURALS, CERAMICS, AND KIVA ARCHITECTURE WITH A WESTERN FLAVOR IN A RIO GRANDE PUEBLO**

Pottery Mound is one of several Rio Grande sites where Classic Period kiva murals have been found and the most important in terms of the volume of material recovered. While all these sites share iconographic and architectural characteristics generally typical of eastern Anasazi pueblos, each is also distinct. Pottery Mound alone combines Rio Grande traits with western Pueblo influence; Hopi ceramics clearly served as inspiration for Pottery Mound muralists and potters. Similarities and differences in the mural iconography of Pottery Mound, the other Rio Grande sites, and the Hopi area illustrate the cultural diversity of the Pueblo IV Anasazi.

*Crown, Patricia (New Mexico) and Suzanne K. Fish (Arizona)*

**[85] GENDER AND POWER IN THE HOHOKAM PRECLASSIC TO CLASSIC TRANSITION**

Archaeological research generally confirms increasing social differentiation during the Hohokam Classic Period. However, scholars have not addressed the issue of who benefitted from this shift or how power was distributed along gender lines. We explore the relative position of women in Hohokam society at the PreClassic to Classic Transition by examining changes in the architecture of domestic spaces, access to ritual spaces, time allocated to productive tasks, and status as reflected in mortuary data.

*Cruz, S. (see McCafferty, G.)* [30]

*Cunnar, G. (see Taylor, R.)* [97]

*Curet, Antonio (Gettysburg College)*

**[48] MORTUARY PRACTICES, SOCIAL DEVELOPMENT, AND IDEOLOGY IN PUERTO RICAN PREHISTORY**

It is widely recognized by archaeologists that mortuary practices can provide information on the social organization, ideology, religious beliefs and, to a certain degree, the political structure of a cultural group. This work reviews the evidence on mortuary practices among prehistoric groups of Puerto Rico, proposes a possible sequence of changes through time, and presents alternative explanations for such changes. Although it is obvious that changes in these practices correlate with cultural developments, it is argued here that they also reflect changes in the socio-political and ideological structure of the groups. More specifically, these shifts are seen as the product of the development of social complexity and are discussed here from the perspective of the economic and ideological structure developed to establish and maintain the new political system.

*Curtis, Ross (Western Cultural Resource Management) and Roger Walkenborst*

**[89] A COMPARATIVE VIEW OF SMALL HOUSE FORM AND FUNCTION IN THE CHACOAN SYSTEM: INVESTIGATIONS AT THE CHACOAN OUTLIER OF WHIRLWIND LAKES**

In modeling the Chacoan Anasazi Regional System a focus has been placed on defining the nature of interactions between Chaco Canyon and communities defined as "outliers", but a limited amount of data has been available from the great houses and small houses that make up these communities. Recent excavation of a 17 room small house and concurrent community pattern studies at the Whirlwind Lakes Outlier in northwestern New Mexico as part of the El Paso Pipeline Project, provides comparative data that can be used to address small house site function, dating, architecture, and interaction.

*Dancey, William (Ohio State)*

**[23] THE VALUE OF SURFACE ARCHAEOLOGICAL DATA IN EXPLORING THE DYNAMICS OF COMMUNITY EVOLUTION IN THE MIDDLE OHIO VALLEY**

Recent research in the Middle Ohio Valley has documented a pattern of change from a dispersed sedentary community pattern during the Early and Middle Woodland periods to a nucleated pattern in the late Woodland. Although identified through examination of excavation data, understanding the dynamics of this shift requires regional scale data that an excavation strategy cannot supply. In this paper evidence is marshaled

to show that surface data reflect the same pattern revealed by excavation and that a representative regional sample of settlement debris sufficient for testing hypothesis of settlement pattern change can be acquired through survey of plowzone surfaces.

*D'Andrea, A. Cathertne (Simon Fraser)*

**[94] LATER JOMON PLANT HUSBANDRY IN NORTHEASTERN JAPAN**

Recent archaeological data from northeastern Japan demonstrate the presence of foxtail millet and buckwheat by 2000 B.C. and rice by 787 B.C. Direct evidence of the nature of husbandry activities associated with these domesticates is not yet available, although research is progressing on this problem. This paper outlines the research and presents a model describing the prehistoric cultivation of these species based on ecological and historical data on farming practices in northeastern Asia.

*Danforth, Marie (Southern Mississippi)*

**[106] CHILDHOOD HEALTH PATTERNS IN THE LATE CLASSIC MAYA: EVIDENCE FROM ENAMEL MICRODEFECTS**

Childhood health patterns were investigated using patterns of enamel microdefect formation in mandibular canines from 95 individuals from three Late Classic Maya populations (Barton Ramie, Seibal, Tikal). Wilson bands, striae of Retzius, and linear enamel hypoplasias, all non-specific growth arrest indicators, showed few differences in frequencies and ages-at-formation in comparisons between the sexes, between juveniles and adults, and among the three sites. Late Classic Maya, however, experienced significantly more growth disruption between ages four and five compared to Colonial Maya. These findings, especially the apparent homogeneity in health patterns, are discussed in light of the Collapse.

*Dasovich, Steve J. (Florida State)*

**[41] THE EFFECTS OF SEA LEVEL TRANSGRESSION AND STORM DAMAGE ON COASTAL SITE INTEGRITY: COASTAL DIXIE COUNTY, FLORIDA, AS AN EXAMPLE**

The impact of transgressive seas on site integrity is largely undefined. While damage caused by normal tidal flow and wave action can be measured under average weather conditions, damage caused by catastrophic events is more difficult to measure. In February, 1993, the "Storm of the Century" struck the gulf coast of Florida, interrupting archaeological and geological work on Bird Island (8D152), Florida. Sustained 160 kph winds and sea surge caused dramatic destruction on the site. The strata of nearby sites on coastal islands will be evaluated for storm damage. The role of storms in redistributing inundated sites will be discussed.

*Davidson, Katherine (Arizona State)*

**[61] BEHAVIORAL SIGNIFICANCE OF VARIATIONS IN THE MORPHOLOGY OF THE MASTOID PROCESS**

Mastoid morphology of the California Chumash reveals evidence of tumpline use. Intensive use of tumplines by Chumash women (Hudson and Blackburn, 1982) involved repeated use of the sternocleidomastoid muscles which in turn, it is hypothesized, would cause hypertrophy of the mastoid and a reduction in the sexual dimorphism of this feature. It appears that differential use of tumplines does result in a lack of mastoid dimorphism. This study provides an occupational marker for tumpline use that can be applied to other skeletal populations whose cultural practices are less well known. This study also provides an easily replicable method of determining mastoid size.

*Davis, S. (see Rowe, M.)* [103]

*Day, D. (see Prentiss, W.)* [105]

*Deagan, K. (see Hoffman, K.)* [101]

*deFrance, Susan D. (Florida Museum of Natural History)*

**[65] UNINVITED GUESTS: OLD WORLD RODENTS ON SPANISH COLONIAL SITES**

Spanish importations of plants and animals to New World settlements included many unintentional species. Two opportunistic species that accompanied Spaniards were Old World rats, both black (*Rattus rattus*) and brown (*Rattus norvegicus*) varieties. Introduced rats thrived in areas of Spanish settlement. *Rattus* remains in archaeological contexts provides temporal indicators of early Spanish settlement and indicates a potential disease vector. This paper reviews the occurrence of rats in Spanish colonial archaeological contexts from sites in Florida, the Caribbean, and Peru and discusses how these remains have helped to date sites and to provide insights on the destructive nature of unintentional animal imports.

*Deibl, Richard* [Discussant 14]

*Dekin, A. (see Cassell, M.)* [35]

*Delle, J. (see Mullins, P.)* [62]

*Demarest, Arthur A. (Vanderbilt) and Juan Antonio Valdes (Universidad de San Carlos)*

[76] WARFARE AND THE COLLAPSE OF CLASSIC MAYA CIVILIZATION

This paper presents the preliminary conclusions of the Petexbatun Regional Archaeological Project. For six years, this multi-disciplinary project has explored architecture, monuments, domestic areas, settlement patterns, ecology, nutrition, exchange systems, and fortifications of the Petexbatun region, Guatemala. Project discoveries demonstrate that in the eighth century Petexbatun political systems disintegrated in endemic warfare. Models are proposed for underlying causes of this warfare. We examine the implications of these findings for general theories of the collapse of Classic Maya civilization.

*Dendy, J. (see Reinhard, K.)* [22]

*Dent, Richard J. (American University) and Harry Schuckel (American University)*

[19] DEVELOPING AN INTEGRATED ARCHAEOLOGICAL INFORMATION SYSTEM: THE AMERICAN UNIVERSITY EXPERIMENT

This poster display documents a computer-based archaeological information system developed at American University. Our goal in creating the system is to support both field and laboratory operations. The resulting system is built around a TOPCON GTS-3B total station as well as an IBM PS/2 microcomputer. Imaging hardware consists of a TARGA+ board and JVC color video camera. System software all operates within a WINDOWS environment. System operation is illustrated using data from the Shawnee Minisink Paleoindian site.

*Dering, J. (see Boyd, C.)* [103]

*Dering, Pbil (Texas A&M University)*

[98] SAGUARO AS A FACTOR IN THE DISTRIBUTION OF CLASSIC PERIOD SALADO SITES IN THE TONTO BASIN, ARIZONA

This paper presents an assessment of the productive potential of saguaro in the Tonto Basin. Saguaro is chosen due to its importance within the belief/subsistence systems of the Sonoran Desert people. Because the Tonto Basin is in a transition zone at the edge of the Sonoran Desert, saguaro is distributed unevenly in favorable microhabitats in the uplands. Using field observations and a GIS database, areas of high productive potential within the basin are identified and mapped in relation to Classic period Salado sites. Conclusions are drawn regarding the role of saguaro as an upland resource in the Tonto Basin.

*Derr, J. (see Rowe, M.)* [103]

*Dewar, Robert (Connecticut)*

[79] DOES IT MATTER THAT MADAGASCAR IS AN ISLAND?

Madagascar is a very large island in the Indian Ocean. Two kinds of questions are posed: (1) What consequences for its prehistory result from its insularity? Does it share specific resemblances with other islands that are reflected archaeologically? Alternatively, does its great size reduce the importance of being an island? (2) Have prehistorians approached the study of Madagascar's past in any special way because it is an island? In other words, are there implicit biases in "island archaeology?"

*Diehl, Michael W. (University at Buffalo and Santa Fe Institute)*

[99] SELF-AGGRANDIZERS AMONG MOGOLLON LATE PITHOUSE PERIOD VILLAGERS?

Recent diachronic comparisons of southwestern North American pithouse dwellers suggest that the appearance of self-aggrandizing or "entrepreneurial" individuals may have occurred by A.D. 1000. Their appearance may be a consequence of the relaxation of social restrictions on prestige competition, that may have resulted from changes in their subsistence economy.

*Dietler, Michael (Yale) and Ingrid Herbich (California-Berkeley)*

[51] IT'S ABOUT TIME: AN ETHNOARCHAEOLOGICAL PERSPECTIVE ON THE CONCEPTUALIZATION OF TEMPORALITY AND HISTORY IN ANCIENT SOCIETIES

An ethnoarchaeological perspective is offered on the evolving theoretical discussion about differences in the ways that time is conceptualized by archaeologists and by the subjects of archaeological research in ancient societies. The reckoning and representation of time, biography, and history in a rural African society (the Luo of Kenya) are examined and ramifications for archaeological interpretation are explored. Luo time-reckoning is shown to be a relational process in which cyclical and linear conceptions of time are articulated to discern sequence and duration and to order personal experience and history in a temporal framework; and temporality is shown to be a pervasive feature of representations of social relations and identity.

*Dillehay, T. (see Baenziger, M.)* [25]

*Dirkmaat, D. (see Adovasio, J.)* [69]

*Dirkmaat, D. (see Carr, K.)* [69]

*Disbta, Joseph (Pueblo of Zuni)* [Forum Participant 95]

*Dobres, Marcia-Anne (California-Berkeley)*

[12] ENGENDERING THE MAGDALENIAN: INTERPRETING OSSEOUS TECHNOLOGICAL VARIABILITY IN THE PYRÉNÉES

Following from structuralist principles, the tangible remains of prehistoric material production can be studied to infer dynamic processes of social reproduction. At the microscale, production activities constitute arenas within which social identities can provide guidelines for material conduct. One universal dynamic process central to technological praxis, regardless of its particular historical configuration, is gender. Adapting principles from practice and gender theory this paper considers tentative models for the social organization of osseous technology during the late Magdalenian in the Midi-Pyrénées, summarizing findings of the first comparative and regionally-focused technical analysis conducted in the Ariège and Haute-Garonne.

*Doelle, William H. (Center for Desert Archaeology) and Henry Wallace (Center for Desert Archaeology)*

[7] REGIONAL VARIATION IN THE PLATFORM MOUNDS OF CENTRAL AND SOUTHERN ARIZONA: COMPARISONS BEYOND THE PHOENIX BASIN

Although platform mounds occur throughout much of central and southern Arizona, the concentration of platform mounds in the Phoenix Basin has historically been the focus of most research. Recent large-scale excavations and intensive survey in the Tonto Basin, Tucson Basin, eastern Papagueria, and the lower San Pedro valley now provide a large dataset for regional comparison with the existing Phoenix Basin data. In this paper we examine variation in time of construction and use, construction methods, site structure, demographic scale, and regional interaction. The implications of these data for regional social development models are outlined.

*Dolukbanov, Pavel (Newcastle)*

[45] THE PLEISTOCENE/HOLOCENE TRANSITION IN NORTH-EASTERN EUROPE: ENVIRONMENTAL CHANGE AND SOCIAL ADAPTATION.

Three consecutive waves may be distinguished in the initial settlement of the North-East European plains: 1) 13,2-12,0; 2) 12,0-11,0; 3) 11,0-10,0 ka B.P. The first two occurred during the Allerød-Bölling; the last one during the Younger Dryas. All three waves resulted from the overflow of the surplus population in the Palaeolithic core areas: 1) The Atlantic (Western) Europe; 2) The periglacial Eastern/Central Europe. The subsequent socio-economic development in the North-Eastern Europe proceeded as a gradual adaptation to the increasingly forested environment of Early Holocene.

*Donoghue, J. (see Anuskiewicz, R.)* [41]

*Donoghue, J. (see Faught, M.)* [41]

*Doran, James (Essex)*

[99] THE EOS PROJECT: INTEGRATING TWO MODELS OF PALEOLITHIC SOCIAL CHANGE

The EOS model and tested now to be reported addresses two key questions prompted by our earlier work. How can social hierarchies come into being without individual resource acquisition tasks of parallel complexity? How can two competing views of Upper Paleolithic social change (Mellars' emphasizing the growth of decision hierarchies vs. Gamble's emphasizing the intensification of alliance negotiation) be incorporated into a unified framework? These questions require a deep consideration of the relationship between group dynamics, agents' social models, and the characteristics of the resource environment.

*Dorn, R. (see Lincoln, T.)* [50]

*Dorn, Ronald I. (Arizona State), David S. Whitley (California-Los Angeles), and Joseph M.*

*Simon (W and S Consultants)*

[103] ROCK ART AND PRE-CLOVIS COLONIZATION OF THE AMERICAS

Geomorphological research demonstrates that a major change in erosion and deposition, thus site preservation, occurred at the Pleistocene-Holocene interface. The sudden appearance of Clovis sites correlates with the change to favorable preservation conditions. Instead of looking for elusive, preserved and stratified Pre-Clovis sites, our research focuses on exposed rock art on stable cliff faces. We obtained chronometric Pre-Clovis ages on six petroglyphs, using AMS <sup>14</sup>C and cation-ratio dating, corroborated by replicate and correlative dating, thus supporting the Pre-Clovis hypothesis. Second, we also consider the Clovis-first hypothesis, showing that it cannot be reconciled with its own Paleoindian data.

*Douglas, John E. (Montana)*

[7] THE WESTERN EDGE OF THE CASAS GRANDES REGION: PIECING TOGETHER ECOLOGY, POWER, AND SOCIAL BOUNDARIES

Interaction between the late prehistoric settlement of Paquimé (Casas Grandes) and the surrounding region has been examined mainly in Chihuahua and New Mexico. In Sonora and Arizona, the eastern portion



of the Yaqui River watershed often is seen as a part of the Casas Grandes region. Yet this western edge remains little-known and enigmatic. As a first step, relevant survey and excavation data from Sonora and Arizona are examined. Hypotheses are developed concerning interaction along the western edge, including issues of settlement hierarchies, social boundaries, the effects of distance, and the role of ecological variability.

*Douglass, Amy A. (Tempe Historical Museum)*

[42] MOVING POTS OVER LONG DISTANCES: PRIVILEGE OR NECESSITY?

Long-distance exchange is regarded as a key factor in the sociopolitical development of the prehistoric plateau Southwest. Yet many questions remain concerning the structure of regional exchange systems and the role of exchange in culture change. This paper documents the production-distribution system of Little Colorado White Ware as a case study of a long-distance exchange system. Compositional analyses and a distance decay study are employed in order to document the production-distribution system of this ware. The results demonstrate that regional distribution patterns that have been cited as evidence for prestige exchange can result from other types of exchange systems.

*Downum, C. (see Bostwick, T.)* [26]

*Downum, Christian (Northern Arizona University)*

[23] THE RELIABILITY OF SURFACE ARTIFACT ASSEMBLAGES AS PREDICTORS OF SUBSURFACE REMAINS: A CASE STUDY FROM SOUTHERN ARIZONA

This paper attempts a direct test of the reliability of surface artifact data by comparing artifact assemblages obtained through controlled surface collections with assemblages subsequently recovered from the same site through excavation. The sample of sites used in this comparison comprises a variety of Hohokam limited activity and habitation sites in southern Arizona. General conclusions are presented about the reliability of surface artifact data, especially with respect to how well surface data can be used to model subsurface ratios of major artifact categories, and how well such data can predict the type and location of subsurface features.

*Doyel, David E. (Estrella Cultural Research)* [Discussant 80]

*Doyel, David E. (Estrella Cultural Research)*

[7] PRODUCTION AND EXCHANGE OF OBSIDIAN ARTIFACTS FROM THE GATLIN SITE, SOUTHERN ARIZONA

Analysis of obsidian artifacts from the Gatlin Site (Arizona Z:2:1) using X-ray fluorescence (EDXRF) determined that most are from the nearby Saucedo source. While 15 percent of the total sample ( $n=75$ ) is made of non-local obsidian, 27 percent of the projectile points are of non-local materials, suggesting trade in finished points. Mobilization of resources through exchange may be indicated.

*Drake, D. (see Hill, M.E.)* [74]

*Drayer, F. (see Walker, P.)* [54]

*Drolet, Robert P. (Ogden Environmental and Energy Services)*

[32] SITIO MURCIÉLAGO: A LATE PERIOD AGRICULTURAL VILLAGE IN SOUTHERN COSTA RICA

The focus of discussion is Sitio Murciélago, an interior valley habitation site located along the Térraba River in southern Costa Rica. In the 1980s, intensive investigations conducted here resulted in mapping the complex, dating the site, and analyzing its internal features. The village was a late period domestic center associated with several cemeteries sites, residential compounds containing large diameter house foundations, and an extensive area of alluvial farmland. Murciélago appears to represent a typical agricultural community that developed during this time in the interior valley zone of the Térraba River Basin. The discussion about this late period village center on its overall size, internal complexity, and regional importance within the multi-village network that developed in the Diquis Region during the Chiriqui Phase (A.D. 1000-1500).

*Drollinger, H. (see Jones, R.)* [37]

*DuBarton, A. (see Buck, P.)* [75]

*Dubrovsky, Gertrude W. (Princeton)*

[81] A SMALL WORLD: A COMMUNITY OF JEWISH FARMERS

It is on the community level that it is possible to investigate the social, economic, political, cultural, and even the religious acculturation of the Jewish immigrant. Early Jewish immigrants from Europe who settled on farms in Farmingdale, New Jersey, knew little about farming and less about the life-style and language of their neighbors. The settlers created new social institutions to live viable Jewish and economic lives. Their organizations and self-help networks were modeled after those in the small villages they had left behind. Ideology shifted from religion to social reform, which ultimately created conflict between the

community members. This intracommunity conflict produced a dynamic tension among the farmers, resulting in a vibrant creative community.

*Duff, Andrew I. (Arizona State)*

[42] POST-CHACOAN COMMUNITY DYNAMICS AS REVEALED BY HOUSEHOLD INTERACTION.

How do we get from sherds to social organization? One technique for revealing social relationships is the analysis of localized exchange. With this idea in mind, I examine ceramic compositional data from several post-Chacoan (A.D. 1175-1275) roomblocks in west-central New Mexico. Analysis reveals information about the scale of ceramic production, localized exchange, the spatial extent of community and the role of community centers. This is used to bridge the gap between ceramics and behavior, and I conclude with a discussion of community dynamics in light of these results.

*Dugmore, A. (see McGovern, T.)* [46]

*Dunbar, J. (see Anuskiewicz, R.)* [41]

*Dunbar, James S. (Bureau of Archaeological Research)*

[41] THE STRATIGRAPHY OF SUBMERGED LATE PLEISTOCENE SITES FROM THE UPPER SUWANNEE RIVER TO APALACHEE BAY

This paper will identify and discuss the major stratigraphic regimes known to contain Clovis and Suwannee age Paleo Indian artifacts in wetland and submerged environments. Clovis and Suwannee point Paleo Indian sites are concentrated in north and central Florida from the Ocala Ridge in the central peninsular westward to the gulf coast between Tampa and Apalachee Bays. Because inland water tables and sea level rose with the retreat of the last Wisconsin ice-sheet, many Paleo Indian sites are now located in wetland or submerged environments. Research on submerged sites such as the Page/Ladson (8Jc591) in the Aucilla River has revealed deep and complex stratigraphic sequence rich in preserved organic material.

*Dunnell, Robert C. (Washington)* [Discussant 27]

*Dunnell, Robert C. (Washington)* [Discussant 3]

*Dunnell, Robert C. (Washington)*

[49] THE IMPACT OF "STATISTICAL TECHNIQUES FOR THE DISCOVERY OF ARTIFACT TYPES" ON ARCHAEOLOGY

Albert Spaulding's influence on contemporary archaeology is quite substantial. Much of that influence can be traced to his seminal paper "Statistical Techniques for the Discovery of Artifact Types," published in 1953. This paper examines the specific impacts, both intended and unintended, of that paper on the nascent New Archaeology of the 1960s and beyond.

*Earle, Timothy K. (California-Los Angeles)* [Discussant 81]

*Easton, Norman Alexander (Yukon College and Northern Research Institute)*

[41] METHODS OF EXCAVATION AND ANALYSIS OF THE MONTAGUE HARBOUR UNDERWATER SITE, BRITISH COLUMBIA (1989-1993)

This paper will present the development and application of locating, excavating, and analyzing prehistoric archaeological remains recovered from submarine sediments dating to circa 7000 years ago in Montague Harbour, British Columbia. Excavation in a tidal and subtidal environment will be discussed, along with the potential for further work along the coast of British Columbia.

*Ebert, J. (see Cassell, M.)* [35]

*Edwards, S. (see Winslow, D.)* [37]

*Eerkens, Jelmer (California-Santa Barbara) and Robert L. Bettinger (California-Davis)*

[27] VARIATION IN GREAT BASIN PROJECTILE POINTS

The neo-Darwinist program cannot succeed in archaeology without detailed empirical studies. We cannot understand how selection acts on material culture, for example, until we first understand the source and nature of the empirical variation in material culture on which it acts, which is poorly studied. Statistical analysis of several thousand Great Basin projectile points demonstrates that 80% of the variation in linear attributes is determined by the mean of the attribute, which implies production guided by relative, not absolute, error tolerances. Variability substantially greater or less than this suggests corresponding variations in group or individual production goals.

*Ehrenreich, Robert M. (National Research Council)*

[12] CRAFT SPECIALIZATION WITHIN A HETERARCHICAL SOCIAL STRUCTURE: A METALLURGICAL PERSPECTIVE

The sociopolitical structure of a society affects the level of craft specialization that can be realized. A societal means of controlling resources or technologies is required if high levels of craft specialization are

to be achieved. This presentation will examine the societal structure of central-southern Britain during the Middle and Late Iron Ages (550-10 B.C.) and discuss how the heterarchical structure of that period affected the level of craft specialization attained. The ironworking community of this period will be used as an example.

*Elera, Carlos (Calgary)*

**[77] THE CUPISNIQUE CULTURAL COMPLEX AND ITS ROLE IN THE ORIGIN OF MOCHE, NORTH COAST OF PERU**

In the published Andean archaeological literature, the origin and coalescence of Moche (culture, society, state) is almost unknown. Many scholars have thought that "Chavín" was the initial antecedent of Moche. However, the archaeological record (including data from my recent fieldwork) indicates that the Cupisnique Cultural Complex, in its late phase and with its religious ideology, played a crucial role in the origin of Moche and it must be understood.

*Elia, Ricardo J. (Boston University)* [Discussant 38]

*Elia, Ricardo J. (Boston University)*

**[70] CONTRACT DILEMMAS IN PUBLIC ARCHAEOLOGY**

Despite the fact that archaeology by contract predominates in public archaeology, there has been surprisingly little discussion of contractual issues within the discipline. This paper highlights several important contract dilemmas that are increasingly challenging the practice of public archaeology, including the issues of ownership and use of data; confidentiality; and publication restrictions. It is argued that many of the contractual conditions that are imposed upon archaeologists violate basic principles of public archaeology, especially the concepts of public interest and public rights to information. Coping with these dilemmas poses an ethical and professional challenge to archaeologists working in a competitive business environment.

*Eling, H. (see Turpin, S.)* [103]

*Ellis, Christopher J. (Western Ontario)*

**[84] FACTORS GOVERNING THE USE OF STONE PROJECTILE TIPS: THE ETHNOGRAPHIC DATA**

Stone projectile points have figured prominently in stylistic, technological, and functional archaeological analyses. Yet, the basic question of why points on stone as opposed to other materials should be employed at all is rarely addressed. I report here on a pilot survey of world-wide ethnographic and ethnohistorical literature designed to generate answers to this question. Major factors isolated as important to stone tip use or non-use include: the size of the game, the "danger" of the game to the hunter, use of poisons, whether the projectile is "thrust" or "thrown" at the prey, and climatic considerations.

*Ellwood, B. (see Harrold, F.)* [9]

*Ellwood, Brooks B. (Texas-Arlington), Francis B. Harrold (Texas-Arlington), and Karl M. Petruso (Texas-Arlington)*

**[70] MAGNETIC SUSCEPTIBILITY AND ITS ANISOTROPY AS A TOOL FOR DETERMINING INTRA-SITE CORRELATIONS AND SITE EVOLUTION: AN EXAMPLE FROM KONISPOL CAVE, SW ALBANIA**

Magnetic susceptibility, an indicator of iron mineral concentration, was measured for 585 samples from Konispol Cave, SW Albania. Comparisons between magnetic susceptibility profiles from three excavations within the cave show distinctive patterns which allow direct correlation between excavations. These data provide a quick and inexpensive means for investigators to correlate between and within sites, without resorting to other more time consuming and expensive methods. Anisotropy of magnetic susceptibility data, measured for 208 of these samples, provide information on tectonic and stratigraphic changes which have affected the site during occupation from the Late Paleolithic to Late Neolithic time.

*Elson, Mark (Center for Desert Archaeology)*

**[26] THE PYRAMID POINT PLATFORM MOUND: INTEGRATION IN THE TONTO BASIN**

The Pyramid Point platform mound is one of the smallest mounds in the greater Southwest, measuring less than 75 square meters. It may have functioned as a type of signal tower to convey information to integrate separate subsystems in the surrounding settlement system. Unlike some of the larger platform mounds, which appear to have been restricted areas and areas for immediate public viewing, the Pyramid Point mound appears to have been designed for viewing from a distance. It is clearly visible from the tops of five other platform mounds. Furthermore, data are presented that suggest that the mound was more of a locus for ceremonial activities than actual habitation.

*Eriksen, B. (see Juel Jensen, H.)* [16]

*Eriksen, Berit Valentin (Aarhus)*

**[45] RESOURCE MANAGEMENT, SUBSISTENCE STRATEGIES AND ADAPTIVITY IN LATE PLEISTOCENE-EARLY HOLOCENE NORTHWESTERN EUROPE**

Late Pleistocene hunters of northwestern Europe had the choice of a variety of game animals. Especially reindeer, horse and elk dominated the menu. The paper first examines the varying importance/dominance

throughout time of these species and asserts our possibilities of making inferences from hunting strategies to socio-economic structures (social group size, mobility, etc.). In the early Holocene game resources generally becomes more widespread and less diversified... or do they? The second part of the paper re-examines the data from northwestern Europe and discusses how Late Pleistocene-Early Holocene hunters adapted to the changing environment.

*Erkelens, Conrad (International Archaeological Research Institute)*

**[19] LOW ALTITUDE AERIAL PHOTOGRAPHS FROM ROCKET LAUNCHED CAMERAS**

Aerial photography is a remote sensing technique with methods and applications that are well understood. Although interpretation of the results is uncomplicated, the cost is often prohibitive for small-scale research projects. Hobby rocketry has been in existence for decades and has included the use of rockets equipped with cameras as part of the ongoing experimentation of enthusiasts. The availability, low cost, and general reliability of these rocket launched cameras has application for archaeologists seeking an affordable means of photographing their archaeological sites. The technique is outlined and examples from recent research in the Hawaiian Islands are displayed.

*Erlanson, J. (see Moss, M.)* [92]

*Erlanson, Jon M. (Oregon) and Madonna L. Moss (Oregon)*

**[56] CULTURES AND ENVIRONMENTS OF THE PACIFIC COAST OF NORTH AMERICA BETWEEN ABOUT 11,500 AND 8,000 YEARS AGO**

Between 11,000 and 8,000 years ago, maritime peoples were in the early stages of settling the diverse coastal landscapes from southeast Alaska to Baja California. Relatively early evidence for coastal adaptations has been found in the vast region, with coastal sites now dating between about 10,000 and 11,500 cybp in the northern and southern areas. In this paper, we examine environmental changes, subsistence patterns, and technological developments for this period, discuss different models for the origin of these early maritime peoples, and consider some explanations for the dearth of early sites along the coastlines of northern California, Oregon, and Washington.

*Estin, Ufuk (Istanbul University)*

**[24] THE PROVINCIAL UBADID CULTURE OF DEĞIRMENTEPE (MALATYA, EASTERN TURKEY)**

The mound of Değirmentepe was located on the south bank of the Euphrates in Malatya Province of eastern Turkey. In 1986 it was inundated by the lake behind the Karakaya dam. Layers 6-11 represent an Ubaid II culture of provincial character. The settlement pattern, mud-brick architecture, painted and unpainted Ubaid-type pottery, other finds, together with the stamp-seals and clay sealings in layer 7, indicate that a proto-urban, complex society inhabited Değirmentepe during the late fifth and early fourth millennia B.C. The economy of this society was mostly based on mixed farming and long distance exchange of trade goods.

*Espejel, Claudia (Instituto Nacional de Antropología e Historia)*

**[8] DOMESTIC STRUCTURES AT XALTOCAN, MEXICO**

Excavations at Xaltocan, Mexico, exposed the corner of a house with walls made of sand-clay bricks on a kind of "cobble-clay" floor. This type of domestic structure was associated with other features such as pottery decorative motifs, which could help to distinguish regional differences in the Valley of Mexico during postclassic times.

*Ezzo, J. (see Altschul, J.)* [86]

*Ezzo, Joseph (Statistical Research, Inc.)*

**[54] ZINC AS A PALEODIETARY INDICATOR: TWO DECADES OF UNSCIENTIFIC REASONING IN ARCHAEOLOGICAL BONE CHEMISTRY ANALYSIS**

The use of the concentrations of zinc in archaeological bone as an indicator of past diets has become almost universally accepted in archaeological analysis, despite the fact that there is no physiological or biochemical basis for such usage. Many claims regarding zinc—such as trophic-level effects and the relationship between dietary zinc intakes and bone zinc levels—represent either a misuse of or a disregard for basic nutritional, physiological, and bone chemistry data. Until a sound physiological basis for such claims is established, the use of zinc as a paleodietary indicator is unscientific and invalid.

*Fagan, J. (see Bennett-Rogers, A.)* [35]

*Falconer, Steven E. (Arizona State) and Patricia L. Fall (Arizona State)*

**[46] POPULATION GROWTH, AGRICULTURAL INTENSIFICATION, AND THEIR ENVIRONMENTAL IMPACTS AROUND THE EASTERN MEDITERRANEAN**

The advent of agriculture initiated localized environmental degradation in Southwestern Asia. However, regional impacts, especially widespread deforestation, resulted from population growth and agricultural intensification beginning in the fourth millennium B.C. We combine palynological and settlement data to



reveal episodes of increased settlement density and cultivation of foodstuffs for long distance exchange (e.g., olives). These intermittent pressures led to long-term cumulative effects epitomized by the virtual elimination of native woodlands. Regional impacts often are attributable to short-term demands by urban markets. Rural subsistence patterns (including pastoralism) may be responses to, as well as causes of, environmental degradation.

*Fall, P. (see Falconer, S.)* [46]

*Farqué, A. (see Bennett-Rogers, A.)* [35]

*Farris, Glenn J. (California Park Service)*

[11] FROM EPIDEMICS TO ACADEMICS, CHANGES IN NORTHERN CALIFORNIA INDIAN SOCIO-GEOGRAPHIC ORGANIZATION DURING THE PAST THREE CENTURIES

For at least a century, study of socio-political organization of the California Indians has been based heavily on ethnographic information derived from living Indians. Recently, this ethnographic data has been used to project onto the archaeological finds for village placement and political organization. Ignored were the dramatic changes that occurred in the living patterns of the California Indians due to physical and cultural impacts, among which were epidemic diseases and village concentration. Through use of ethnohistoric material, archaeological data may be re-evaluated to arrive at alternative projections of pre-contact culture in California.

*Faught, Michael (Arizona) and Joseph Donoghue (Florida State)*

[41] INUNDATED ARCHAEOLOGICAL SITES AND PALEORIVER CHANNELS IN THE APALACHEE BAY OF NORTH-WEST FLORIDA

An exposition of the techniques and results of subbottom profiling in the Apalachee Bay of northwest Florida is presented, including the reconstruction of paleoriver channels, karst geomorphological features, and stratigraphic regularities. Computer graphic techniques are used to present the results. Evidence from submerged archaeological sites for the timing of sea level rise along the west coast of Florida will be presented, including geoarchaeological and geomorphological evidence for the inundation of the Apalachee Bay, and models for future geological and archaeological discoveries.

*Feddema, Vicki (British Columbia)*

[10] EARLY FORMATIVE SUBSISTENCE AND AGRICULTURE ON THE PACIFIC COAST OF CHIAPAS, MEXICO

Analysis of carbonized plant remains recovered from four sites in the Mazatán area of Chiapas indicates that the cultivation of domesticated plants was well underway by the beginning of the Early Formative period. Maize, beans and avocados are the most ubiquitous of the identified species. While it is difficult to assess the actual dietary contributions of these taxa, the temporal and spatial consistency in their archaeological occurrence suggests that they were of some economic significance. This is discrepant with stable carbon isotope data that suggest that maize, at least, was not a significant dietary component during the Early Formative Period.

*Fedick, S. (see Hovey, K.)* [5]

*Fedick, Scott (California-Riverside) and Karl A. Taube (California-Riverside)*

[5] THE VIEW FROM YALAHAU: A NEW PERSPECTIVE ON THE NORTHERN MAYA LOWLANDS

The Yalahau Regional Human Ecology Project was initiated in 1993 to investigate ancient Maya settlement, resource management, and monumental architecture within the wetland zone of northern Quintana Roo, Mexico. This research has provided a fresh perspective on ancient Maya political organization of the northern lowlands, particularly for the Early Classic period, when a standard architectural style, and possibly a regional road system may signify a previously unrecognized political formation. The research orientation of the project is discussed, initial findings are summarized, and new research questions are posed.

*Feinman, Gary M. (Wisconsin-Madison)* [Discussant 81]

*Feinman, Gary M. (Wisconsin-Madison)* [Discussant 29]

*Fergus, R. (see Clark, J.)* [81]

*Ferrell, R. (see Merriwether, D.)* [106]

*Few, J. (see Wheat, P.)* [52]

*Finlayson, Bill (Edinburgh) and Steven Mithen (Reading University)*

[84] MICROLITHS AS PROJECTILE POINTS? A CASE STUDY FROM WESTERN ENGLAND

Microliths from Mesolithic assemblages in Britain have traditionally been assumed to be projectile points used to hunt large terrestrial game, and to be associated with upland summer hunting camps. In northern

Britain, and especially in Western Scotland, this assumed role of microliths becomes very questionable. Mesolithic sites in this region typically have very large numbers of very small microliths, regardless of site location. In this paper we consider the likely function of these microliths by examining recently excavated material from sites on the island of Islay dating to between 7-8,000 B.P. Our approach attempts to integrate various studies, including use-wear, spatial analysis, experiment, and raw material availability.

*Finney, F. (see Lensink, S.)* [105]

*Finsten, Laura (McMaster University)*

[14] CORE-BOUNDARY TRANSFORMATIONS AT MONTE ALBÁN'S MARGIN

The Classic-Postclassic transition in the southern Mesoamerican highlands saw the decline of large-scale states and urban centers such as Monte Albán in the Valley of Oaxaca and Yucuñudahui in the Nochixtlán Valley, and the emergence of dozens of small-scale polities. To the west of Monte Albán, in the Mixtec Sierra separating these valleys, the peripheral Peñoles region bore the veneer of a controlled boundary zone on the frontier of Monte Albán's Classic state. In the Late Postclassic, it was the hearland of an autonomous petty kingdom. This paper examines the Classic-Postclassic transition in the Peñoles region, focusing on changing core-periphery relations and sociopolitical organization in the Peñoles periphery.

*Fisb, P. (see Fisb, S.)* [46]

*Fisb, Paul R. (Arizona)* [Discussant 85]

*Fisb, Paul R. (Arizona) and James M. Bayman (Arizona State)*

[26] THE SOCIAL CORRELATES OF PRODUCTION, CONSUMPTION, AND EXCHANGE AT THE MARANA MOUND SITE

Specialized roles in manufacture and exchange are among the more common factors implicated in origins of social differentiation. Centers with platform mounds have long been identified as localized foci of such roles in Hohokam society because these sites yield a disproportionate share of the materials that circulate in regional exchange. Distributional data pertaining to social units at the Marana Mound site are among the most comprehensive for any Hohokam platform mound settlement and permit evaluation of differential participation in production, consumption and exchange. A site-wide pattern of intensive and relatively uniform participation is substantiated by multiple lines of evidence, but difficult to resolve with ethnographic models.

*Fisb, S. (see Crown, P.)* [85]

*Fisb, S. (see Stuart, G.)* [98]

*Fisb, Suzanne K. (Arizona) and Paul R. Fisb (Arizona)*

[46] IMPLICATIONS OF SCALE IN LAND SURFACE MANAGEMENT BY THE HOHOKAM

In the southern deserts of the Southwest, perceptions of arable land are often synonymous with opportunities for applying supplemental water by ethnographically documented techniques. A compilation of records for an agricultural site type supplied by ephemeral runoff suggests that such uniquely prehistoric features cover an suspected magnitude of territory throughout the Hohokam domain. This sample documents agricultural micromanagement of land surfaces over tens of thousands of hectares on dry slopes in southern Arizona and reveals an unrecognized scale of landscape modification. These findings underscore the extensive nature of Hohokam agricultural systems and their environmental and economic implications.

*Fischer, Lynn (Michigan)*

[16] HUNTER-GATHERER MOBILITY AND MODELS OF LITHIC RESOURCE PROCUREMENT: A CASE STUDY FROM THE UPPER DANUBE BASIN

Strategies of lithic raw material procurement are an important source of information about regional organization of land use. This paper evaluates alternative explanations for changing patterns of lithic raw material use and transport documented for Late Glacial and Early Postglacial times in the upper Danube basin. Expectations are derived from proposed models of change in hunter-gatherer mobility strategies at the Pleistocene/Holocene boundary. Effects of changing mobility on scheduling of tool production and maintenance, costs of raw material acquisition, and tool needs and discard rates are considered. Implications for long-term change in hunter-gatherer land use are discussed.

*Fitzhugh, Ben (Michigan)*

[79] ISLANDS IN THE MIDDLE: DYNAMIC INTERACTIONS IN THE NORTH PACIFIC

For decades, scholars have maintained that the northern Gulf of Alaska is segmented into relatively bounded cultural groups whose evolution has largely resulted from isolation punctuated by periods of cultural replacement. It is becoming increasingly clear that a more complex set of models are needed to explain the sequence of cultural developments in Southwest Alaska. This paper examines the complex

interplay between geographic distance (relative isolation) and social interaction in the evolution of relatively complex hunter-gatherer-fisher societies.

*Fitzhugh, William W. (Smithsonian Institution)*

[79] THE DORSET THULE TRANSITION: TAKE 2

The Eastern Arctic was not free of glacial ice and available for human occupation until ca. 4500 years ago. In the succeeding period, a succession of cultures appeared, each demonstrating greater efficiency in adapting to rigorous (and changing) environmental and climatic conditions. Using the Dorset-Thule transition as a case study, this paper considers whether the culture history of the North American Arctic behaves like an (isolated) "island" system in terms of biogeographic and evolutionary models. Are these models of any use in describing or understanding Arctic cultures, or are they simply distractions?

*Fleming, David (Columbia University) and Monica Barnes (Cornell)*

[15] ARE THE PUQUIOS OF NAZCA PREHISTORIC?

At the 1993 SAA meeting "definitive proof" of first millennium A.D. dates for Nazca puquios was announced. Evidence is two AMS dates of component stones. Basic principles of stratigraphy are ignored. In accepting prehispanic dates we must disregard identical medieval works in Spain's Andarax Valley. Although hispanic engineers built similar water systems in Spain, the Canary and Balearic Islands, Mexico, and the Andes, we are asked to believe that they did not build, or recognize those Nazca. We suggest the puquios may include reused dressed masonry, and propose lines of research to resolve the dating question.

*Flemming, Nicholas (Institute of Ocean Sciences)*

[41] PREHISTORIC SUBMARINE ARCHAEOLOGY: WHAT IS THE REAL RATE OF PROGRESS?

Prehistoric submarine archaeology is a minority interest with important goals. The community of interested researchers is below the critical mass for steady intellectual growth in any one country, and is small globally. OCS surveys and academic projects tend to be structured around predictive modelling and acoustic technology. New sites are gradually added to the inventory by repeated surveys by divers, or by further chance finds. The progress in excavating submarine prehistoric sites and artifacts is slow but very encouraging, with lithic artifacts found as deep as 145m below present sea level in a core taken tens of kilometers offshore. Over 100 submarine prehistoric sites are known world wide. Proposals are made for improving communications, news, highlighting objectives, and project support.

*Fletcher, Laraine (Adelphi University) and Silvia Salgado (SUNY-Albany)*

[32] MACROREGIONAL RELATIONS BETWEEN NICARAGUA AND THE SOUTHERN PERIPHERY OF MESOAMERICA, 300-800 A.D.

Data from recent research projects in northcentral and southern Pacific Nicaragua suggest that these regions were engaged in strong interaction with regions of Honduras and El Salvador, especially central Honduras and eastern El Salvador, between A.D. 300-800. The paper explores the impact that this interaction had in the emergence of complex societies in Nicaragua and how these societies were part of a macroregional system that could be characterized as a periphery to the Mesoamerican world-system.

*Floss, Harald (Universität Köln)*

[16] CLIMATE AND RAW MATERIAL BEHAVIOR: A CASE STUDY FROM LATE PLEISTOCENE HUNTER-GATHERERS OF THE MIDDLE RHINE AREA OF GERMANY

In a project continuing over the last five years, lithic raw materials from 40 Paleolithic sites in the Middle Rhine area of Germany dating from lower to final Pleistocene have been analyzed. The first evidence for longer-distance transport of exogene materials is in the Middle Paleolithic. During the Upper Paleolithic there is a constant increase of exogene materials with its climax in the Magdalenian. As primary factors determining raw material procurement strategies we consider climate conditions, paleoenvironment and hunter-gatherer mobility. This is illustrated by a comparison of raw material procurement of Magdalenian and the following Azilian industries.

*Fogel, Hedy*

[15] GALLINAZO SETTLEMENT PATTERNS: SOME POSSIBLE SOCIAL AND POLITICAL IMPLICATIONS

Gallinazo cultural materials date to ca. 100 B.C.-200 A.D., and are found in the Casma, Nepena, Chao, Viru, Moche, Chicama, and Jequetepeque Valleys. This paper will examine the social and political implications, types and distribution of Gallinazo settlements in the Viru, Santa, and Moche Valleys. The hypothesis that will be examined is that the patterns of settlement indicate that the Gallinazo polity was a well organized and centralized early state with an urban capital at the Gallinazo Group site in the Viru Valley.

*Foradas, James (Ohio State)*

[19] NORMATIVE MINERAL COMPOSITIONS AS A MEANS OF DISTINGUISHING BETWEEN MIDWESTERN CHERTS (FLINTS) USED BY SCIOTO HOPEWELL

Over three hundred samples of chert (flint) from outcrops associated with prehistoric quarries in the chert-bearing Burlington, Upper Mercer, Zaleski, Vanport, Brush Creek, and other formations, were analyzed

using ICP and other methods. Concentrations of nine common elements in the cherts were converted to quantities of "Normative" minerals known to be in the cherts as a result of their geology. Variations in normative mineral compositions proved useful in differentiating Scioto Hopewell chert artifacts. The method and results of minimally destructive artifact tests will be discussed.

*Ford, A. (see Olson, K.) [12]*

*Ford, Anabel (California-Santa Barbara)*

[81] INTEGRATION AMONG COMMUNITIES, CENTERS, AND REGIONS: ORGANIZATION OF THE MAYA OF THE BELIZE RIVER AREA

Complex societies depended on an hierarchical structure to organize and integrate constituent populations and mobilize resources. Hierarchies are manifest in the arrangement of individual settlements, the variability within local communities, and the composition of regional centers. For early civilizations, agriculture was a fundamental component of the economy. Archaeological examples of complex societies provide an excellent testing ground for identifying the household, community, and regional mechanisms of organization and integration because, ultimately, wealth in these societies must be tied to the production potential of land and control of labor. This presentation examines the complex hierarchical relations of the ancient Maya.

*Ford, Pamela J. (Mt. San Antonio College)*

[18] QUAKES AND CLAMS: GEOLOGICAL EVENTS AND ARCHAEOLOGICAL REALITIES

What happens to the coastal subsistence system when the resource base is shaken by an earthquake and inundated by a tsunami? The marine invertebrate assemblage from the West Point site complex documents pre and post earthquake resource dependence on the Northwest Coast of North America over a 4,500 year time span. These remains reflect changes in the locally available shellfish resource base instigated by geological alterations to the intertidal zone.

*Forsman, Leonard A. (Larson Anthropological/Archeological Services)*

[70] TRADITIONAL CULTURAL PROPERTY EVALUATION IN URBAN CONSTRUCTION PROJECT SETTINGS: A SEATTLE, WASHINGTON CASE

Evaluation of traditional cultural properties (TCPs) in an urban setting presents unique challenges to archaeologists, Indian tribes, and project managers. The Municipality of Metropolitan Seattle (METRO) retained Larson Anthropological/Archaeological Services (LAAS) to evaluate TCPs within the construction corridor of proposed sewage and stormwater project in Seattle, Washington. Landforms within the project area are central to local aboriginal mythology and may have cultural importance to the Muckleshoot, Suquamish, and Duwamish Tribes. METRO and LAAS are working with the Tribes to acquire information from Indian communities in support of the TCP evaluation, which will be a model for future projects.

*Foster, M. (see Breternitz, C.) [7]*

*Foster, M. (see Mitchell, D.) [80]*

*Foster, Michael (Soil Systems, Inc.)*

[30] THE MARISMAS NACIONALES BURIALS: DEATH, SOCIETY, AND WORLD VIEW IN COASTAL WEST MEXICO

Two hundred and fifty burials were recovered during excavations at several late Classic and Post Classic sites in the Marismas Nacionales of coastal west Mexico. Burials occurred in spatially discrete mounds and contained an array of burial goods. This study describes the results of a search for horizontal and vertical differentiation within and between the burial groups. Evidence of membership in social units and non-kin associations such as task groups is reviewed as is evidence for social ranking. Finally, world view as reflected in the mortuary practices is discussed.

*Fowler, C. (see Fowler, D.) [40]*

*Fowler, Don D. (Nevada-Reno) and Catherine S. Fowler (Nevada-Reno)*

[40] FROM LOVELOCK CAVE TO PAQUIME: IMAGES OF THE PREHISTORIC AMERICAN WEST, 1846-1994

Interpretive illustrations—drawings, paintings and photographs of archaeological sites and imagined prehistoric scenes or events in the Great Basin and the Greater Southwest—have been published since 1846. These images, produced by archaeologists, artists, explorers, photographers and professional illustrators, reflect changing conceptions of the culture histories of the regions and varying degrees of "Romantic" and "scientific" interpretation of prehistoric sites and material culture. In this paper we discuss a number of illustrations in relation to changing archaeological and popular conceptions of prehistory and Native American heritage.



*Fowler, Don D. (Nevada-Reno) and Nancy Parezo (Arizona State Museum)*

[38] PRESERVING THE ARCHAEOLOGICAL RECORD; AN ETHICAL OBLIGATION

Archaeologists have always pointed to careful scientific recording of research data as one of the characteristics of professionalism. The records of archaeological research are an important part of the archaeological resource, and contain primary information needed for understanding the past. These materials are irreplaceable and essential for future research and education. These materials are unique resources for studying the history of archaeology and its contributions to the development of the sciences and humanities. Archaeologists have a professional responsibility to serve as stewards for these research records, and insure they are preserved for use by future generations.

*Fowler, Peter J. (Newcastle Upon Tyne)* [Respondent to Addyman 3]

*Francis, Julie (Wyoming Transportation Department)*

[103] ROCK ART TRADITIONS IN NORTHWESTERN WYOMING: CHRONOLOGY, SPATIAL DISTRIBUTIONS, AND IMPLICATIONS FOR THE NUMIC SPREAD

Northwestern Wyoming contains two distinct aboriginal rock art styles: the pecked Dinwoody tradition and a variety of incised motifs. Dinwoody rock art is the most ancient, with  $^{14}\text{C}$  and cation ratio dates of over 6000 years B.P. Dinwoody and incised rock art exhibit almost no spatial overlap. Yet, the two traditions are temporally coeval for at least the last 1000 years. It is argued that Dinwoody represents the indigenous rock art of northwestern Wyoming and can be ascribed to Numic speaking groups who have occupied the area for several thousand years.

*Frangipane, Marcella (Università di Roma)*

[24] THE RISE OF A LOCAL CENTER AT ARSLANTEPE-MALATYA AND THE DYNAMICS OF EARLY STATE DEVELOPMENT IN THE LATE URUK PERIOD

The 4th millennium levels at Arslantepe are important for understanding both the autonomy of the first "urban" centers in eastern Anatolia and the importance of interregional relations in subsequent developments. Continuity between the Local Late Chalcolithic and the Late Uruk is evidence for the formation of an autochthonous centralized power at this site. However, the nature and extension of this power appear to be profoundly changed in the Late Uruk period, when participation in new interregional exchange networks likely put the elite in a position to exert administrative control over at least part of the primary economy.

*Fratt, L. (see Gregonis, L.)* [52]

*Fratt, Lee (Arizona)*

[33] THE ROCKY ROAD OF GROUND STONE ANALYSIS IN THE AMERICAN SOUTHWEST: A HISTORICAL PERSPECTIVE

This paper examines ground stone artifact analysis in relation to the major intellectual trends of Southwestern archaeology. Its purpose is to place in perspective the efforts of pioneering researchers such as Richard B. Woodbury and to suggest future orientations, problems, and goals. Considered an important part of archaeological assemblages during the first half of the 20th century, ground stone artifact analysis was virtually ignored in the 1960s and 1970s. This trend is reversing as new approaches to identifying artifact use, understanding grinding technology, and investigating artifact manufacture and tool design are producing new insights into prehistoric economics and social organization.

*Frederick, Charles D. (Texas-Austin)*

[8] GEOARCHAEOLOGICAL INVESTIGATIONS IN THE NORTHERN BASIN OF MEXICO

Geoarchaeological studies associated with excavations at Xaltocan explored two issues: the origins of the island, and the types of resources available to the former inhabitants. Reconnaissance of the northern Basin revealed geomorphic features, two beaches and a strand plain, on the northwest side of the basin which suggest that the lakes of Xaltocan and Zumpango probably were more stable than previous studies have suggested. Furthermore, stratigraphic and archaeological evidence suggest that the island of Xaltocan is a tell constructed on the lakebed more than a kilometer from the western shore. Aerial photograph analysis and additional fieldwork on the lakebed east of Xaltocan located the remains of chinampas presumably constructed during the Early Aztec occupation of the site.

*Fredrickson, David* [Discussant 83]

*Fredrickson, David (Sonoma State), Greg White (Sonoma State), and Michael Love (Sonoma State)*

[11] RESOURCE ADMINISTRATION AND THE DEVELOPMENT OF COMPLEX HUNTER-GATHERERS IN THE NORTH COAST RANGES, CALIFORNIA

Application of optimal foraging models to archaeological data from California's North Coast Ranges (NCRs) support the occurrence of a marked organizational change in several localities between about 2000 and 3000 years ago. This change is presumed to mark a shift from Forager to Collector and has been attributed

to resource intensification. Recent investigations in the NCRs, reported here, suggest that social processes may contribute to such results and point out the need to study not only the development of Collector from Forager but also the interaction between Collector and Forager.

*Freeman, A. (see Hajic, E.)* [88]

*Freeman, Andrea (Arizona)*

[74] GEOARCHAEOLOGICAL APPROACHES TO PALEOINDIAN STUDIES: LIKE WATER FOR CHOCOLATE?

Prior to the Folsom discovery, geology was considered an integral part of what would become known as Paleoindian archaeology. Though an association has continued to the present day, "interdisciplinary" work between archaeologists and geologists often has separate goals. Developing a sound interdisciplinary approach demands that archaeologists and geologists work cooperatively in a milieu that addresses the interests of both sciences. Paleoindian archaeology operates at a geographic and temporal level that can take advantage of new conceptual schemes and funding opportunities in the geological sciences, and that can bring additional insight into the earliest human occupation of North America.

*Frisson, G. (see Sellet, F.)* [74]

*Frisson, George C. (Wyoming) and Robson Bonnichsen (Oregon State)*

[56] THE PLEISTOCENE-HOLOCENE TRANSITION ON THE PLAINS AND ROCKY MOUNTAINS OF NORTH AMERICA

As the continental ice sheets and valley glaciers receded at the end of the Pleistocene, Clovis populations occupied the Great Plains and river valleys well into the lower elevations of the Rocky Mountains. Climates and vegetation were changing; several animal species were extinct or rapidly disappearing. After Clovis, continually increasing numbers of more localized human groups with different subsistence strategies in both plains and mountains continued until about 8,000 years ago when the continual trend toward drier climatic conditions forced human groups into true hunting and gathering subsistence and exploitation of different ecological niches.

*Frost, R. (see Raymond, C.)* [32]

*Fujita, H. (see Rosales-López, A.)* [57]

*Fujita, Harumi (Centro Regional del Instituto Nacional de Antropología e Historia)*

[57] PREHISTORIC COASTAL ADAPTATIONS INFERRED FROM EXCAVATION DATA FROM THE SITES OF EL MEDANO AND EL CONCHALITO, BAJA CALIFORNIA SUR, MEXICO

Results to date of an ongoing research project addressing prehistoric coastal adaptations in the Cape Region of Baja California, Mexico are presented. The research area encompasses the littoral zone from La Paz bay on the Gulf of California south to Cabo San Lucas. This represents the most systematic and extensive survey program yet carried out in the Cape region, an area increasingly impacted by resort development. Along with primary data on site type and distribution along the coast, preliminary inferences regarding changing patterns of shellfish exploitation over the last 4,000 years will be discussed.

*Gaines, Sylvia (Arizona State) and Warren M. Gaines (Arizona State)*

[37] COMPUTER SIMULATION OF A DIACHRONIC MODEL PORTRAYING VILLAGE ADAPTIVE BEHAVIOR UNDER ENVIRONMENTAL STRESS

The focus is a hypothetical prehistoric, small farming community based on empirical data drawn heavily from the Colorado Plateau of the American Southwest. The model tracks an extensive range of village activities, kinship and population dynamics (by individuals), environment, food production, and building sequences through five generations. Available resources, human biological attributes, climatic factors and behavioral rules are input variables to the model. Dynamic adjustments of village strategies are simulated, using AI techniques of inference and Knowledge Base rules, to observe, on a year by year basis, the impact of changes on village behavior relating to land use, allocation of resources, labor and energy budgeting. A modular, table-driven approach provides great flexibility for either instructional or research applications.

*Gaines, W. (see Gaines, S.)* [37]

*Gamble, Clive (Soubampton)*

[40] IMAGES AS THEORIES ABOUT CAVE MEN

Cave men have been portrayed in three main ways—heroic, comic, and scientific. This paper examines the visual language employed by the three traditions and concludes that the central proposition of progress is common to all. The association of dinosaurs and cave men is presented as an example of the Jurassic tendency in contemporary paleolithic theory.



*Gamble, Lynn (California-Los Angeles)*

[11] THE EFFECTS OF SPANISH COLONIZATION ON CHUMASH SOCIOPOLITICAL ORGANIZATION.

The Portola land expedition of 1769 marked the beginning of an era of intensified contact between the Chumash Indians of the Santa Barbara Channel Coast region and the Spanish. Journals from the 1769 expedition indicate that the settlement of Helo' was the largest village observed at this time, with an estimated population of approximately 800 individuals. By 1804 Helo' was abandoned. Fluctuations in house size, village size, exchange goods, and political organization at Helo' during this critical 35 year period reflect the complex impacts of Spanish colonization on the sociopolitical systems of the Chumash.

*Garber, James (Southwest Texas State)*

[10] EXCAVATIONS AT THE CEREMONIAL CENTER OF ONTARIO VILLAGE, BELIZE: RESULTS OF THE 1993 FIELD SEASON

During the summer of 1993 excavations were initiated by Southwest Texas State University at the medium sized Maya ceremonial center of Ontario Village in Cayo District, Belize. Excavations on the main mound revealed evidence of extensive ritual activity on the primary axis dating to the Late Classic period. Additionally, an elite burial was encountered within the construction fill of the final construction phase. The presence and character of this site provides important information in the reconstruction of the sociopolitical systems of the Belize River Valley.

*Gardner, K. (see Shaffer, B.)* [72]

*Gaybeart, H. (see Kardulias, P.)* [73]

*Gebauer, A. (see Price, T.)* [47]

*Gelb, Phil R. (Navajo Nation Archaeology Department)*

[97] CONTINUOUS OR NOT? ARCHAIC OCCUPATION OF THE CENTRAL COLORADO PLATEAU

Hunter-gatherer occupation of the Colorado Plateau during the Archaic Period has been traditionally characterized as continuous, but marked by evolutionary changes. An alternative model contends the Archaic period was punctuated by regional abandonments and reoccupations, resulting in a succession of new lifeways and material culture. These two models are evaluated with regard to the radiocarbon record and Archaic material culture of the Glen Canyon region. Long-term continuity in occupation throughout the entire Archaic period is supported. Adaptive shifts involving increased residential mobility and changes in settlement pattern partially account for previous gaps in the Colorado Plateau radiocarbon record.

*Gerken, D. (see Carroll, M.)* [63]

*Gerlach, Craig (Alaska-Fairbanks)*

[47] THE DYNAMICS OF SUBSISTENCE RESOURCE USE AND THE ORGANIZATION AND DEVELOPMENT OF VILLAGE COMMUNITIES IN THE LATE PREHISTORIC NORTH ALASKA

This paper investigates the causes and consequences of shifting settlement patterns as a result of control over strategic resource locations on both the coast and in the interior of Alaska. Several cultural and economic transition points are discussed wherein the relationship of mobility to sedentism is a function of changing ecological relationships, the emergence of complex political systems, and patterns of cultural integration, trade, and warfare.

*Gerrell, P. (see Anuskiewicz, R.)* [41]

*Gerry, John (Harvard University)*

[106] CLASSIC MAYA DIETARY PATTERNS: THE SIGNIFICANCE OF SOCIAL AND ECOLOGICAL VARIABLES

This paper discusses dietary patterns among the Classic Maya as they are revealed by stable carbon and nitrogen isotope ratios preserved in human bone. Skeletal samples are drawn from seven sites: Uaxactun, Holmul, Baking Pot, Barton Ramie, Seibal, Altar de Sacrificios, and Copan. The isotopic results indicate that Maya dietary behavior was not so much socially dictated as it was spatially determined; i.e., neither class nor gender nor chronological context are significant factors of isotopic variation when compared to geographic location. Micro-environmental factors are examined to account for regional groupings, but ultimately, settlement density is considered a more significant variable.

*Gessler, Nicholas (California-Los Angeles)*

[99] STEPS TOWARDS CREATING AN "ARTIFICIAL CULTURE:" THE EMERGENCE OF GLOBAL CULTURAL PATTERNS FROM LOCAL PARTICIPANT RULES

Individual actors, operating under individual local rules, can automatically produce collective global patterns of behavior that emerge solely through their mutual interactions. Interestingly, these global patterns of behavior are not programmed into the simulation. They have no existence within the individual actors.

Rather, they come into being only as the entire system evolves. These dynamics of "The Science of Complexity" are variously referred to as emergent, self-organizing, cybernetic, synergetic, dynamical, or non-linear systems. Paradigms have crystallized in conferences on "Artificial Life." The time seems ripe to press epistemological successes in some behavioral and social sciences into service in modeling cultural evolution and change in anthropology.

*Gettelman, K. (see Havill, L.)* [106]

*Giesso, M. (see Glascock, M.)* [19]

*Gifford, John A. (Rosenstiel School of Marine and Atmospheric Sciences) and Steve Koski (Miami)*

[41] EARLY HOLOCENE DEPOSITIONAL ENVIRONMENTS IN LITTLE SALT SPRING

Little Salt Spring (LSS; 8S018), Florida, possesses an extensive funnel-shaped basin containing a terrestrial/lacustrine sediment sequence from 1-4m thick. Despite excavations from 1971 to 1979, a definitive stratigraphic sequence was never published. New test excavations in the LSS basin and cores from the sediment cone in the spring bottom have yielded a sequence of subaqueous and subaerial deposits from the Late Pleistocene/Holocene boundary. Eolian quartz sands characterize the subaerial deposits. Intensive human activity, represented by wood, bone, and antler implements, occurred between 8500-9500 C-14 y.B.P. during a period of lowered spring levels. Organics predominate in later deposits, including the peats that hold 1000+ Middle Archaic burials on the basin's perimeter.

*Gifford-Gonzalez, Diane (California-Santa Cruz)*

[40] LE PLUS C'EST LE CHANGE. REPRESENTATIONS OF AGE AND GENDER IN ARTISTS' PORTRAYALS OF HUMAN ANCESTORS

Artists' depictions of human ancestors have recently been recognized to be powerful and semi-autonomous discourses that actively form expert as well as popular understandings of the past. Analysis of over 500 such images reveals strong patterning in representations of activity, placement in the frame, and posture relevant to gender and age. Images drawn from the fine arts of bygone centuries imbue many recent representations with potent messages about gender and power in Paleolithic life. To disrupt our habits of viewing, post-war Western representations of anatomically modern humans are explored for aspects of their social content.

*Gilman, Antonio (California State-Northridge)* [Discussant 12]

*Glascock, M. (see Cogswell, J.)* [78]

*Glascock, M. (see Olson, K.)* [12]

*Glascock, Michael (Missouri), Martin Giesso (Chicago), Richard L. Burger (Yale), and Ernesto Salazar (Universidad Catolica-Quito)*

[19] SOUTH AMERICAN OBSIDIAN STUDIES AT THE MISSOURI UNIVERSITY RESEARCH REACTOR

The Archaeometry Laboratory at the Missouri University Research Reactor is assembling a database of obsidian source analyses for South America. Obsidian from sources and archaeological sites in the countries of Bolivia, Colombia, Ecuador, Peru, and Chile has been studied by neutron activation analysis. The complete analysis, which yields 27 elements, differentiates chemically similar sources. Source determination of artifacts is assisting archaeologists in understanding the movement of obsidian throughout the Andean region.

*Glass, C. (see Howard, J.)* [26]

*Glassow, Michael A. (California-Santa Barbara)* [Discussant 92]

*Goebel, Ted (Alaska-Fairbanks)*

[94] LATE PLEISTOCENE HUMAN SETTLEMENT OF SUBARCTIC SIBERIA

Joint Russian-American field research has begun on a series of subarctic Siberian Upper Paleolithic sites preliminarily dated to 30,000-20,000 B.P. These sites include Alekseyevsk and Shishkino-8 on the upper Lena River, Nepa-1, Ineiskii Bor, and Kremennoe on the upper Nizhnaia Tunguska River, and Ust'-Kova on the middle Angara River. To date, with the exception of Ust'-Kova (extensively excavated in the 1970s), these sites have only been preliminarily studied. Each is well-stratified and thought to contain an Upper Paleolithic component that, based on initial radiocarbon dates and/or stratigraphy, predates the last glacial maximum.

*Goldberg, Paul (Texas-Austin) and John Jacob (Texas A&M University)*

[87] GEOARCHAEOLOGICAL INVESTIGATIONS AT OP. 4046, COLHA, BELIZE

Geoarchaeological investigations at Op. 4046 focused on the delineation and documentation of site stratigraphy and the generation of hypotheses concerning site formation processes. Four stratigraphic units consisting of calcareous and decalcified silty and sandy clays were found to overlie a weathered marly substrate; these contain artifact material dated from 2500-1100 B.C. The two black uppermost units are

noteworthy for anthropogenic inputs from nearby mound erosion. Micromorphological, grain size, carbonate and organic matter analyses suggest low energy sedimentation, modified by pedoturbation and leaching.

*Goldstein, L. (see Watkins, J.)* [38]

*Goldstein, Paul (Dumbarton Oaks and American Museum of Natural History)*

[43] **FORMATIVE AND TIWANAKU—CONTEMPORARY SETTLEMENT PATTERNS IN THE MOQUEGUA VALLEY, PERU**

Results of the first season of the Moquegua Archaeological Survey suggest a more complex social landscape than indicated by previous site-centered investigations. The distribution of Prehispanic sites discovered in the 1993 season of systematic reconnaissance displays conspicuous differences in settlement choices and agricultural pattern among Formative (Huaracane Phase), Tiwanaku, Wari, and Late Intermediate occupations. Ongoing settlement pattern survey will continue to shed light on the interaction of the first expansive states and indigenous chiefdoms in the South Central Andes.

*Goles, G. (see Ayers, W.)* [6]

*Goodby, Robert G. (Wheaton College)*

[96] **TYPOLOGY AND MEANING: PROBLEMS WITH IMPOSING ORDER ON CONTACT PERIOD CERAMICS FROM SOUTHEASTERN NEW ENGLAND**

Typology, with its emphasis on order, consensus, and hierarchy reproduces in prehistory the dominant values of modern society. Typological frameworks mask diversity and individual expression in material culture much as modern elites emphasize consensus to marginalize dissenting voices in political discourse. The study of aboriginal ceramics in southern New England has relied on ceramic "types" as horizon markers and as markers of discrete social groups. Contact period ceramics from Narragansett Bay are used to dispute the existence of "types," and to argue that diverse ceramic styles were actively used to symbolize Native unity and autonomy in opposition to European colonialism.

*Goodman, Dean (Miami, Japan Division), Yasusbi Nishimura (Nara National Cultural Properties), J. Daniel Rogers (Smithsonian Institution), Mark Lynott (National Park Service), and James Price (Missouri)*

[63] **JOINT U.S./JAPAN RESEARCH PROJECT TO PROMOTE THE USE OF HI-TECH GROUND PENETRATING RADAR EQUIPMENT AND ADVANCED DATA PROCESSING FOR THE STUDY OF NATIVE AMERICAN ARCHAEOLOGY**

The results of a joint U.S. and Japan research project using non-destructive Ground Penetrating Radar (GPR) at several native American Indian sites are presented. The application of advanced geophysical data processes, which provide estimated archaeological site plans based on gridded radar reflection data taken from closely spaced parallel profiles, are developed. The site plans made from the profiled data provide for an estimation of the depth, shape, size and trend of buried archaeological structures. The data are also integrated into 3-D depth maps depicting the depth to buried archaeological features across the sites. The data show the locations and general shapes of Hopewellian and Mississippian habitation sites, and burial tombs, as well as previously known and reburied excavation trenches.

*Goodyear, Albert C. (South Carolina Institute of Archaeology & Anthropology) and Dan F. Morse (Arkansas Archeological Survey)*

[56] **THE PLEISTOCENE-HOLOCENE BORDER IN THE EASTERN USA**

The Eastern Woodlands from 11,000 to 9,000 B.P. displays both uniformity and diversity from the northeast to the Gulf of Mexico. After beginning with a very widespread Clovis culture, regionalization is readily apparent by latitude. While fluted points persist until 10,000 B.P. in the north, resharpened fluted points (Dalton) may be as early as 10,500 B.P. in the Southeast. Hafted bifaces are the most sensitive to these changes rather than flake tools. The Kirk horizon (9,500-9,000 B.P.) seems to represent a reunification of the East during the early Holocene.

*Gould, Russell T. (Southern Methodist) and Mark G. Plew (Boise State)*

[61] **OPTIMAL FORAGING APPROACHES TO PREHISTORIC SALMON FISHING IN THE NORTHERN GREAT BASIN: THE ECOLOGICAL DYNAMICS OF TRADE-OFFS AND STRATEGIC RESPONSES**

When viewed from an optimal foraging perspective, historic Northern Shoshone salmon fishing provided an important alternative to camas root procurement and mammal hunting, even though the latter represented higher yield-lower cost resources. Salmon fishing and storage buffered camas and mammal shortfalls. Recent archaeological investigations in Southern Idaho address these resource trade-offs in a prehistoric setting. Analytical techniques which link ecological patterns to spatial structure at a variety of scales allow for an empirical evaluation of optimality constructs. This approach allows for a mix of strategies, rather than asserting that one, and only one, predominates.

*Graber, Robert Bates (Northeast Missouri State) and Michael T. Dunne (Northeast Missouri State)*

[99] **CATASTROPHE THEORY, POPULATION PRESSURE, AND POLITICAL EVOLUTION**

Viewing political evolution as a cusp catastrophe precipitated by increasing population density yields surprising retrodictions with definite archaeological implications. Retrodictions overturning those of ordinary population-pressure reasoning include the existence of (1) threshold densities triggering political evolution that then would proceed without further density increase, and (2) ranges within which considerable density decrease would fail to produce significant political devolution. That catastrophe theory can yield specific predictions of future archaeological discoveries is demonstrated by application to the Powhatan chiefdom of Virginia.

*Graffam, Gray (Trent University)*

[14] **BEYOND COLLAPSE: A VIEW FROM THE TIWANAKU HEARTLAND**

Pre-Hispanic state regimes were never quite as totalitarian, in an economic sense, as some models predict, and the issues surrounding state collapse and rural restructuring are fertile topics for the consideration of cultural adaptation. At some point between A.D. 1000 and A.D. 1200, the Tiwanaku polity of the South Andes collapsed. At issue is the degree to which rural peoples were dependent upon state-level institutions for their survival, and ways in which they would have modified their economic activities in the wake of political collapse. The case is presented that field agriculture and llama herding were never matters completely under state "control" and that they present a degree of continuity that called for rural restructuring in the wake of Tiwanaku collapse.

*Grabam, Elizabeth (York University)*

[14] **THE MAYA COLLAPSE—CHAOS AND CONTINUUM**

Having excavated sites with Postclassic and Historic components, I see bridges built as well as burnt over the chasm of Classic collapse. Although environmental degradation is a popularly cited "cause" of collapse, early Postclassic florescence suggests that whatever "degradation" occurred was in the process of permutating political structures. Whole or partial disassembling of supports for Classic power necessitated new frameworks, and these came with new designs and hierarchies. An older view of collapse sees wider Mesoamerican cultural forces at work; though material culture demonstrates population continuity, some changes suggest significant shuffling of people and paraphernalia about the Yucatan peninsula.

*Granger, Joseph E. (Louisville)*

[78] **ORGANIZING THE OBTAINABLE IN ORCHARD PARK: A RE-EXAMINATION OF EARLY WOODLAND EXTRACTIVE CAMPS IN WESTERN NEW YORK**

Recent research conducted around the Petrie site in the town of Orchard Park in New York's Niagara Frontier yielded important information on the organization of catchment surrounding Meadowood Phase extractive camps. These spring-summer settlement types were utilized by microband segments for the taking and processing of fish and secondarily for chert acquisition and territorial control. Petrie Site activities related to chert acquisition are now understood to display a much more dispersed and complex pattern than heretofore defined. The "Petrie pattern" of *Detached Lentic Activity Loct* is described and applied to other extractive camp logistical situations in the Niagara Frontier.

*Graves, Michael W. (Hawai'i-Manoa)* [Discussant 100]

*Graves, Michael W. (Hawai'i-Manoa)*

[81] **KALINGA REGIONAL COMMUNITY BOUNDARIES: AN EVOLUTIONARY EXPLANATION OF STYLE AND TERRITORIALITY**

Ethnoarchaeological research among the Kalinga of the Philippines has documented aspects of their community organization, including: locations of regional boundaries, size of territory, agricultural land, intra-community integration, and intercommunity economic relations. This study examines the relations among these variables within the context of environmental variability involving resource distribution and predictability. An evolutionary explanation is offered for the development of differences in territoriality among the Kalinga. This explanation is tied to evolutionary-ecological models involving risk reduction in highly competitive settings.

*Green, Roger C. (Auckland)* [Discussant 6]

*Green, Roger C. (Auckland)*

[100] **ARCHAEOLOGICAL MANIFESTATIONS OF SOCIAL AND POLITICAL ORGANIZATION IN POLYNESIA**

The development of Polynesian social and political complexity appears to have followed two trajectories, one centered in West and the other in East Polynesia. Sufficient societies within each region conform to the pattern of the other, however, that it is evident actual historical developments were rather more



complicated than would be predicted solely from this fundamental geographic division. Rather, the added complications are suggested to stem from how various social, political, and religious arrangements were worked out among the different elites of each society, as reflected in the kinds of monumental structures they build in the different island groups.

*Greenlee, Diana M. (Washington)*

[35] DOCUMENTING SUBSISTENCE VARIABILITY IN THE OHIO RIVER VALLEY, A.D. 400-1650

The period A.D. 400-1650 is recognized as a time of settlement and subsistence change associated with the appearance of nucleated farming villages in the Ohio Valley. Because settlement and subsistence systems have specific requirements regarding the spatial and temporal distribution of resources, the distribution and particular manifestation of these phenomena will vary through time and across environments. This research documents temporal and environmental variability in faunal remains, botanical remains, and stable carbon isotope ratios from the central and upper Ohio River Valley as a basis for explaining subsistence change.

*Greenwald, David (SWCA, Inc.)*

[80] PUEBLO SALADO AND BRADY WASH: A CASE STUDY OF SITES FROM RIVERINE AND NON-RIVERINE SETTINGS

The Hohokam Classic to post-Classic transition is explored by comparing and contrasting two sites that contain occupations attributed to the Civano and Polvorón phases. Pueblo Salado, located on the floodplain of the Salt River in the Phoenix Basin, and Brady Wash, located on the bajada of the Picacho Mountains south of the Gila River, are used in this case study as both contained continuous occupations from the Civano phase through the Polvorón phase. Effects of the environmental settings upon these sites are examined and explanations concerning changes in attributes between the Classic and post-Classic periods are offered.

*Greenwald, Dawn (SWCA, Inc.)*

[33] TABULAR KNIVES: TECHNO-MORPHOLOGICAL VARIATION WITHIN A TOOL CLASS

Tabular knives have a long use history over a wide geographic area in the Southwest. They form a unique component of both ground and flaked stone assemblages in Arizona by representing a tool of specialized function that transcends multiple cultural boundaries. Morphological, technological, and contextual data from these tools are examined from a variety of sites in the Southwest to derive intra- and interregional interpretations for tabular knife variability.

*Greer, J. (see Greer, M.)* [105]

*Greer, John (Missouri-Columbia) and Mavis Greer (Missouri-Columbia)*

[15] ANTHROPOMORPHS IN PICTOGRAPHS OF SOUTHERN VENEZUELA

Human forms are diverse and appear to refer to a wide variety of activities. Many are thought to refer back to creation time and to what may be mythological ancestors, while others may be tribally biographic and refer to specific events, either mythological or real, which still are in the oral history of local indigenous groups. Some portrayals may simply refer to specific activities, such as dances. What are interpreted as shaman figures may refer either to spirits or to actual persons, while auxiliary figures seem to represent trance state while under the influence of hallucinogenic drugs. States of being (e.g., pregnancy, death) are portrayed, as are such materialistic details as clothing and decoration.

*Greer, M. (see Greer, J.)* [15]

*Greer, Mavis (Missouri-Columbia) and John Greer (Missouri-Columbia)*

[105] AN OVERVIEW OF CENTRAL MONTANA ROCK ART

During the past two years a continuing study of Montana Rock Art has increased the number of recorded pictograph sites in central Montana to over 125. Although paintings generally can be included in the "Central Montana Abstract Tradition," they display a wide variety of stylistic categories that can be differentiated by technological, artistic, and thematic characteristics with perceived temporal and ethnic differences. Some styles portray a public orientation, while others suggest private ritual. All appear to be associated with shamanistic activities.

*Gregonis, Linda M. (Tucson Unified School District) and Lee Fratt (Tucson Unified School District)*

[52] MULTICULTURALISM AND CITIZENSHIP: EVALUATING TUCSON UNIFIED SCHOOL DISTRICT'S ARCHAEOLOGY PROGRAM AT CAMP COOPER

Archaeology is an effective method for creating cultural awareness while developing citizenship skills and self-esteem. In 1992-1993, a middle school with a high Yaqui population participated in a program focusing on Native American perspectives on archaeology. During the 1993-1994 school year, an inner-city middle school will take seventh grade classes through an interdisciplinary unit. The teacher team will pre-test and post-test students to determine (1) the effectiveness of student-centered teaching for that age

group, (2) the impact on attitudes toward other cultures, and (3) the impact of the program on citizenship skills.

*Gregory, David (Archaeological Consulting Services)* [Discussant 26]

*Gregory, David (Archaeological Consulting Services)*

[80] EL POLVERÓN PHASE IN A REGIONAL PERSPECTIVE

El Polverón phase is reviewed from a regional perspective, including reasons for widespread changes that occurred in the late 1300s. Brief consideration is also given to the taxonomic status and general validity of the phase, based upon the various materials that have been grouped under it.

*Grube, N. (see Hammond, N.)* [60]

*Guderjan, Thomas (St. Mary's University), Helen R. Haines (York University), Michael Lindeman (Soil Systems, Inc.), Ellen Ruble (Northern Arizona University), and Pamela Weiss (Montreal)*

[60] THE BLUE CREEK RUIN, BELIZE: AT THE EDGE OF THE PETEN

The Blue Creek ruin is the largest of a series of Maya sites on top of the Bravo Escarpment in NW Belize. This escarpment delineates the eastern boundary of the Peten physiographic region as well as the Late Classic period boundary of the Peten and Northern Belize spheres. Chronological architectural data support the idea that it may have been a "daughter site" of the regional center of La Milpa. The archaization seen in iconography and pottery may reflect attempts to link the rulers to their ancestral lineage and home.

*Gumerman, George J. (Santa Fe Institute) and Timothy A. Kohler (Washington State)*

[99] ARCHAEOLOGY AND THE SCIENCES OF COMPLEXITY

Archaeologists have a long tradition of exploring the development of complexity, however, their use of the term is only partially consistent with the concept as used by the various developing sciences of complexity. Computational experimentation in artificial biological, physical, and cultural worlds may aid in understanding simple rules that result in complex behavior. Archaeologists could profit from the utilization of one of the major strengths of anthropology, the comparative approach, not only by comparing the evolutionary trajectories of diverse cultures, but through a broader comparison of culture with biological and physical complex adaptive complex systems.

*Gustafson, Alice A. (Colorado-Denver)*

[72] THE DUNCAN RANCH SITE 1: A LATE WOODLAND/INCIPIENT ANTELOPE CREEK PHASE SITE

The origin of the Antelope Creek village manifestation on the Canadian River in the Texas Panhandle has been attributed to migration from another cultural area or the acculturation of a local Woodland group based on diffusion of traits and ideas. Research and excavations on the Duncan Ranch Site 1, 41HC124, near the main aggregations of Antelope Creek sites support indigenous development. Contact and trade with groups traversing the Canadian River and innovation resulted in a continuum of traits and processes between an earlier Woodland group and the Antelope Creek village communities.

*Gutiérrez, M. (see Hyland, J.)* [57]

*Gutiérrez, Maria de la Luz (Centro Regional del Instituto Nacional de Antropología e Historia, La Paz, Baja California Sur, Mexico) and Justin R. Hyland (California, Berkeley)*

[57] FIRST REPORT ON THE PROYECTO ARTE RUPESTRE SIERRA DE SAN FRANCISCO, BAJA CALIFORNIA SUR, MEXICO

The Proyecto Arte Rupestre Sierra de San Francisco, Baja California Sur, Mexico, one of the twelve Proyectos Especiales now being carried out by the Instituto Nacional de Antropología e Historia, represents the largest archaeological project ever undertaken in Baja California. The goals of this two-year project are (1) the archaeological investigation of the famous Sierra de San Francisco painted murals and (2) the development of conservation strategies for the mural sites. Project accomplishments to date are reported, including: first AMS dates for the murals, the discovery of a new obsidian source, and evidence for Clovis occupation of central Baja California.

*Habicht-Mauche, Judith A. (California-Santa Cruz)*

[58] CERAMIC PRODUCTION AND SOCIOPOLITICAL CHANGE IN THE NORTHERN RIO GRANDE

This paper examines evidence for the organization of ceramic production and trade in the northern Rio Grande Valley of New Mexico within the context of shifting sociopolitical alliances in the region during the fifteenth century. Preliminary results of attribute and materials analyses of pottery collections from the Galisteo Basin sites of Pueblo Blanco (LA40) and San Marcos (LA98) are presented. This area is generally considered to have been a major center for the production of glaze-painted ceramics during the fifteenth



century, making it the ideal locality from which to explore processes of sociopolitical interaction and change among the Eastern Pueblos.

*Habu, Junko (McGill)*

[47] JOMON, HUNTER-GATHERERS, HOW SEDENTARY WERE THEY?

Despite the common assumption of Jomon people as fully sedentary, living in permanent residential bases year-round, in reality, Jomon settlement systems are poorly understood. In this paper, settlement data from the Moroiso phase (ca. 5,000 B.P.) are used to interpret Early Jomon subsistence-settlement systems. The results suggest that the Moroiso phase people were relatively sedentary, but not necessarily remaining in the same settlement throughout the year. These results are then used to address the question of the development of sedentism from the Initial through to the Final Jomon periods.

*Hackbarth, Mark (Northland Research, Inc.)*

[80] CLASSIC PERIOD HOHOKAM MORTUARY PATTERNS FROM THE SANTA CRUZ FLATS

Excavations at three Classic Period Hohokam sites in south-central Arizona have identified mortuary patterns from the Sedentary Classic period transition and the Classic Period, including a Terminal Classic component. Evidence of secondary cremations, primary and secondary inhumations, mass graves, and initial processing in possible charnel features was found at two habitation villages and one farmstead. In conjunction with an analysis of grave goods, a review of these patterns documents a changing mortuary behavior on the Santa Cruz Flats. Modifications of Classic Period mortuary behavior are associated with the collapse and disintegration of Hohokam cultural systems within the Santa Cruz Flats Hohokam.

*Hager, Lori D. (Stanford University)*

[40] FASHIONING THE "PRIMITIVE" IN HUMAN EVOLUTION: ONE HUNDRED YEARS OF LOOKING AT NEANDERTHALS, LOOKING AT US

Since the first discovery of Neanderthal fossils more than 100 years ago, these early humans have frequently been represented in pictorial form as our "primitive" ancestors: brutish, beetle-browed, stooped over, and dim witted. Our interpretations of who the Neanderthals are in human ancestry have been significantly structured by the visual images presented in both public and scientific spheres. This paper examines how the Neanderthals, more than any other group of hominids, have been used as a locus from which to negotiate cultural, and especially racial, difference through the medium of visual imagery.

*Hagstrum, M. (see Hildebrand, J.) [61]*

*Hagstrum, Melissa (Washington)*

[12] COMMONER AND CRAFT: THE DOMESTIC CONTEXT OF THE PYROTECHNOLOGIES IN THE INKA EMPIRE

The peasant household constituted the backbone of the Inka Empire's overall productivity. The family group, moreover, composed the core of craft production for local, provincial, and state consumption. Investigations in Peru and Argentina show the effectiveness of the peasant household for the multiple roles—agricultural and artisanal—that householders assumed in their economic lives. Archaeological evidence from domestic contexts reveals overlapping patterns in the pyrotechnologies, pottery-making, metal-working, and cooking as well. This paper discusses the character of the domestic pyrotechnic craft economy and examines the form and functioning of the hinterland household as family farm and craft studio.

*Haines, H. (see Guderjan, T.) [60]*

*Hajic, Ed (Illinois State Museum) and Andrea Freeman (Arizona)*

[88] STRATIGRAPHIC AND GEOMORPHIC CONTEXT AT THE PALEO CROSSING PALEOINDIAN SITE, OHIO

Surface survey of the plowed surface of kamic topography yielded abundant Paleoindian debris but the presence and context of potential intact sub-plowzone Paleoindian cultural deposits were in question. Results of a coring program revealed three pedogenically altered lithostratigraphic units. A basal terminal late Wisconsinan supraglacial and/or proglacial loam diamicton (1) consisting of various types of debris flows underlies a silt loam and silt loam diamicton, (2) consisting of debris flows, loess-derived colluvium, and possibly loess. The plow zone (3) differentially truncates these units depending on hillslope location. Units 2 and 3 contain Paleoindian materials. The geometry of Unit 2, deposited and preserved in footslope and toeslope locations, and thickness of plow zone were used as guides of placement of excavation units.

*Haley, S. (see Malinowski, L.) [72]*

*Hall, Barbara Ann (Riverside Community College)*

[36] SPINDLE WHORLS AND THE COTTON TRADE IN MIDDLE CLASSIC MESOAMERICA: PERSPECTIVES FROM THE GULF COAST

For the Aztecs, cotton cloth was a vital trade and tribute item that marked status and achievement. Spindle whorls, a primary artifactual indicator of cloth production, appear during the Epiclassic/Early Postclassic in

most of Mesoamerica, but only in scarce quantities. However, evidence from the Gulf Coast suggests that cloth production became important beginning in the Middle Classic. A ratio of whorls to sherds, and other evidence, suggests that spinning became vital to the economy of certain sites in south and central Veracruz during the Middle Classic, driven at least partly by Teotihuacan interaction. Increased interregional interaction would promote the need for status markers such as cotton, which, in turn, would enhance economic growth and social differentiation in areas that supplied such goods. With the decline of Teotihuacan, cotton production spread to other regions in Mesoamerica.

*Hamilton, Christopher [Discussant 38]*

*Hammond, Norman (Boston University), Gair Tourtellot III (Boston University), John R. Rose (Pittsburgh), and Nikolai Grube (University of Bonn)*

[60] THE CITY OF UCAY: SURVEY AND EXCAVATION AT LA MILPA, BELIZE, 1992-1994

The Classic Maya city of La Milpa in northwestern Belize was until recently one of the least-known major centers in the eastern lowlands. Mapping has now revealed a ceremonial precinct covering 0.5 square kilometers, with a main plaza including two ballcourts and four large pyramids, and construction beginning in the Late Preclassic. Seventeen stelae document elite occupation from before A.D. 450 to after 800, and name two rulers. Monument repositioning may be several centuries later, with veneration arguably continuing into the colonial period. The La Milpa community was extensive, and surveys document its settlement pattern and resource procurement activity.

*Haney, Jefferson (Sonoma State)*

[33] BEDROCK MORTARS AS A REFLECTION OF TRANS-SIERRA SOCIAL AND ECONOMIC INTERACTION

This paper examines hunter-gatherer adaptations through a study of bedrock mortars in the Mono Basin-Long Valley region of the eastern Sierra Nevada. These milling features occur throughout California and are commonly associated with acorn processing. Oak trees, abundant in the western Sierra, are absent in most regions of the eastern Sierra. The distribution of the bedrock mortars in the latter region reflects a broad interaction sphere which involved economic and social relations among populations of the eastern and western Sierra. The importance of these relationships with respect to local adaptive systems and to prehistoric change in the region is investigated.

*Hanson, C. (see Bey, G.) [60]*

*Hanson, Craig (Tulane University), William Ringle (Davidson College), and Sharon Bennett*

[76] THE SIXTEENTH CENTURY ENCOMIENDA VILLAGE FROM NORTHERN YUCATAN, MEXICO

Historical accounts from northern Yucatan concerning conquest-period Maya have been central to ethnographic reconstructions of the Maya, yet independent archaeological verification is as yet scarce. In 1991, discovery of a sixteenth century ramada chapel near the center of the Terminal Classic site of Ek Balam, Yucatan, led in 1992 to mapping and excavations of the church and a portion of the surrounding reduction community, including intensive surface collections of six structures. Since the site is located in one of the earliest zones of encomienda formation in Yucatan, Ek Balam provides insight into initial colonial strategies and indigenous responses.

*Hanson, D. (see Ambrose, S.) [54]*

*Hanson, Diane K. (Puerto Rico)*

[10] ENVIRONMENTAL INFORMATION FROM SHELLFISH AT MONSERRATE, PUERTO RICO

A cultural break between the Cuevas and Ostiones traditions was identified in the 1930s at Monserrate, Puerto Rico, using shellfish associated with the distinctive ceramic styles. The shift in fauna associated with the cultural transition in the Caribbean has been interpreted by various scholars as a result of increasing demographic pressures, environmental changes, or cultural preferences. In 1992, shellfish were collected to determine what the environmental conditions were at the site during this transition: if the associated mangrove was present prehistorically, and what the characteristics were of the local intertidal zone which is now primarily an extensive mudflat bordered by coral reefs.

*Hard, Robert J. (Texas-San Antonio)*

[72] AGRICULTURAL INTENSIFICATION IN THE SACRAMENTO MOUNTAINS OF SOUTHCENTRAL NEW MEXICO

Excavations during the summer of 1993 by the University of Texas at San Antonio Field School provided evidence regarding the role of cultigens at a site which dates to the Late Pithouse period. Located in the pinyon-juniper zone in the Sacramento Mountains, this research can address issues regarding the role of ecological variability in bringing about agricultural intensification, particularly when contrasted with adaptations in the adjacent Chihuahuan desert.

*Hardy, Ellen (Museo Nacional de Costa Rica)*

[32] PETROGLYPHS OF OROSÍ VOLCANO: GRAPHIC REPRESENTATIONS OF PREHISPANIC SOCIAL ORGANIZATION, IDEOLOGY AND RELIGIOUS BELIEFS

Preliminary investigation of an extensive petroglyph field at Sitio Pedregal, Guanacaste National Park, allows insights into prehispanic religious beliefs and social order. Hundreds of abstract and representational elements, technically and iconographically elaborate and sophisticated, depict a complex belief system. Stylistic variation suggests the rock art is the product of more than one cultural group. Comparison of some of the petroglyph images to those found on ceramics indicate Bagaces and Sapoa Periods components (300/500—800 A.D.; 800—1350 A.D.) although it is possible the site was used over more extended duration.

*Hare, Alan (Marty Indian School)* [Forum Participant 95]

*Hare, Timothy (State University of New York-Albany)*

[10] LAPIDARY CRAFT SPECIALISTS AT OTUMBA: THE ORGANIZATION OF CRAFT PRODUCTION IN LATE AZTEC MEXICO

I address the organization of lapidary craft specialization in the Otumba city-state during the Late Aztec period (A.D. 1350-1522). The Otumba Project directed by T. Charlton and D. Nichols identified lapidary production areas at Otumba through surface collections and excavation. The focus of this project is the obsidian, chert, basalt, ceramics, and figurines from a 100% surface collection associated with a lapidary workshop. I integrate ethnohistoric records and archaeological data to explain the organization of lapidary production. I describe the unit of production, lapidary technology, and identify the connections between lapidary craft specialists and elites, merchants and other craft producers.

*Harrold, F. (see Ellwood, B.)* [70]

*Harrold, Francis B. (Texas-Arlington), Karl M. Petruso (Texas-Arlington) and Brooks B. Ellwood (Texas-Arlington)*

[9] ARCHAEOLOGICAL RESEARCH AT KONISPOL CAVE, ALBANIA

In 1993 a joint Albanian-American team continued and expanded the excavation of Konispol Cave in the Sarande District of southern Albania. Components ranging from Hellenistic to at least Epipaleolithic age have been documented in sediments over 4 meters deep. Data collection and analysis were undertaken by project members specializing in ceramic and lithic artifacts, zooarchaeology, paleoethnobotany, geoarchaeology, and palynology. Preliminary results concerning radiocarbon chronology, environments, and human use of the cave will be discussed.

*Hartley, Ralph (National Park Service-Midwest Archeological Center) and Anne Wolley Vause (National Park Service)*

[103] GOING NOWHERE: HOW TO KNOW WHERE YOU ARE IN THE DESERT WITHOUT A GPS

Relationships between the content of prehistoric rock art panels and their position on the landscape is the subject of both speculation and analyses. The mobility requirements of aboriginal groups using arid and semi-arid environments suggests that the location of some petroglyphs and pictographs may be a component of the archeological record that allows for an assessment of routes of movement in southeastern Utah. Did rock art contribute to spatial orientation in this environment? Did the content of rock art panels vary with reference to accessibility? Geographic modeling using physiographic variables helps evaluate minimization strategies in route-finding relative to the position of rock art panels.

*Hartmann, Mark (Texas A&M University)*

[78] THE DEVELOPMENT AND USE OF DUGOUT CANOES IN THE PREHISTORIC SOUTHEASTERN UNITED STATES

Research conducted throughout the southeastern United States has yielded information on a longstanding tradition of dugout canoe manufacture and use. Specifically, data on these craft from Florida, Georgia, South Carolina, Alabama, Mississippi, Louisiana, and Texas, which date from ca. 6,000 B.P. to ca. 500 B.P., indicate that dugouts played a key role in transportation and trade throughout the region. This allowed for an increase in the exchange of information and ideas and the diversification of diet and raw materials. Comparative analyses also indicate general trends in construction methods and style both geographically and temporally.

*Hartwell, William T. (Desert Research Institute)*

[75] PREHISTORIC LAND USE PATTERNING AT THE YUCCA WASH QUARRY SITE

Archaeological investigations at 26NY1011 provide evidence of prehistoric land use patterns near Yucca Mountain on the Nevada Test Site. Variation in the spatial patterning and content of the assemblage is a result of differential usage of the archaeological landscape, and is indicative of site functions beyond simple raw material procurement. Evidence for residential use of this site is present, with outcrops of welded tuff possibly acting as magnets for this and other functions. Three themes of land use are distinguished: (1) a

pattern of exploitative quarrying of lithic resources, (2) a dominantly early pattern of discard or loss of items from a transported toolkit, and (3) short-term residential use.

*Haskins, V. (see Powell, M.)* [59]

*Hastorf, Christine (California-Berkeley)*

[93] LOCAL INTERACTIONS AND LOCAL HISTORY IN THE CENTRAL ANDES

The Upper Mantaro Archaeological Research Project completed archaeological, environmental, and ethnographic research spanning ten years in and around the Hispanic district of Jauja, Peru in the central Andes. Over the years, the primarily American team became more aware of the local people's interpretation of their past as we became involved in a cooperative project to set up a local museum. Through this more regular interaction with local politics we gained a different view of the local people and their history which altered our own views of and writings on the ancestors of the ethnic group we were living among.

*Hauptmann, Harald (Institut für Ur and Frühgeschichte Vorderasiatische Archäologie)*  
[4] NEVALI CORI

At the northern end of the "Levant corridor" and south of the Taurus Range, there are a number of early farming communities of the 8th millennium B.C. Until 1991, Heidelberg University excavated an example of a regional PPNB center, Nevali Cori, which reflects a social complexity that is archaeologically represented in three functions: 1) magazines for the storage of surplus grains, 2) buildings for the primary production of flint tools, clay and stone figurines, as well as monumental sculptures, and 3) a sacred building with monumental sculptures of human, animal and bird-human figures.

*Havill, Lorena M. (Indiana University), Karen D. Gettelman (Indiana University), Diane M. Warren (Indiana University), Keith P. Jacobi (Indiana University), and Della Collins Cook (Indiana University)*

[106] POSTCLASSIC TOOTH FILING AT CHAU HIIX, A MAYAN CEREMONIAL CENTER IN BELIZE

1993 excavations at Chau Hiix yielded 30 human burials, four of which show a common pattern of tooth filing. Upper lateral incisors and sometimes canines have mesial and distal corners removed, and central incisors have lateral corners removed. The three individuals for whom sex can be determined are male. SEM and light microscopy are used to compare our examples with Postclassic filed teeth from Tipu. Methods of filing are discussed.

*Hawkes, K. (see O'Connell, J.)* [27]

*Hawkins, Rebecca A. (Algonquin Consultants, Inc.)*

[23] EXPECTATIONS AND INFERENCES: PLOWZONE ASSEMBLAGES IN THE OHIO VALLEY

Salvage excavations of a Fort Ancient village (ca. A.D. 1100) yielded valuable feature information, but significant data deficits existed regarding artifact assemblage formation processes. The only systematic investigation of the village was an intensive surface collection conducted after chisel plowing but before the plowzone was stripped and truncated features were excavated. This paper uses information derived from surface distributions of lithic and ceramic artifacts to supplement interpretations based on excavation data and enhance, thereby, our ability to infer how the site was formed. It also examines the usefulness of the surface assemblage as an independent database for models about Fort Ancient settlement organization.

*Hayden, Brian (Simon Fraser University)* [Discussant 59]

*Hayden, Brian (Simon Fraser University)*

[99] AGGRANDIZERS AS SYSTEMS ORGANIZERS

Recent work has focused on aggrandizers as central figures in changes that occur from egalitarian hunter/gatherer communities to more complex hunter/gatherer and horticultural communities. The strong power-seeking behavior of these individuals can account for many of the similarities of emergent complex societies in disparate parts of the world, including the manipulation of wealth, the display of prestige and power, and the inherent instability of these groups in rich resource environments. This analysis is predicated on the high probability that at least some aggrandizive personality types naturally occur in all tribal sized populations.

*Hayden, Julian* [Discussant 86]

*Haynes, Gregory (Desert Research Institute)*

[75] THE DEFINITION OF ARTIFACT CONCENTRATIONS, LITHIC REDUCTION STRATEGIES AND STONE TOOL DISTRIBUTIONS AT A WESTERN STEMMED SITE IN SOUTHERN NEVADA

26NY7920 is a 1.2 mile long Western Stemmed Tradition site that is located on the top of a 50 foot high terrace overlooking Fortymile Canyon, on the Nevada Test Site. In 1993, Desert Research Institute recorded and performed an in-field analysis of lithic debitage and stone tools at this site. Spatial analysis of 30 randomly chosen debitage sample units shows at least three artifact concentrations across the site. Debitage analysis



at 26NY7920 suggests that the primary reduction strategy at 26NY7920 was biface thinning, common in many large Western Stemmed sites. Spatial analysis of stone tool classes suggests differences in the activities that produced each artifact concentration.

*Hayward, Michele (Panamerican Consultants, Inc.) and Michael Cinquino (Panamerican Consultants, Inc.)*

[102] EXCAVATIONS AT THE SAN JUAN NATIONAL HISTORIC SITE, 1993, SAN JUAN, PUERTO RICO

Panamerican Consultants, Inc., for the US Army Corps of Engineers has recently completed a mitigation level excavation at the San Juan National Historic Site of El Morro, in Puerto Rico. The project included the excavation of two midden areas at the historic fort, administered by the National Park Service, as well as the undertaking of several specialized studies. The results from the excavation, review of documentary sources, and the stratigraphic/faunal/botanical analyses, are employed to synthesize and outline the nature of fortress construction techniques, military life, socio-economic status and subsistence at El Morro during the Spanish Colonial Period.

*Headrick, Annabeth (Texas-Austin)*

[30] ANIMALS CAUGHT IN THE NET: EVIDENCE OF NAGUALISM AND SHAMANISM IN THE ART OF TEOTIHUACAN

The Teotihuacan preoccupation with imagery from nature has led to current theories of a state that controlled its population through the use of allegories from nature. However, recent studies of other Mesoamerican cultures have revealed the central importance of ritual shamanic transformation among the ruling elite. Through comparison with other Mesoamerican cultures and ethnographic and ethnohistoric sources, this paper will show that depictions of animals from nature were actually perceived as humans in the midst of ritual. This identification of nagualism as an important aspect of Teotihuacan statecraft will illuminate the murky image we now have of the city's political activities.

*Healy, Paul F. (Trent University), Jaime Awe (London), and Hermann Helmuth (Trent University)*

[44] PACBITUM (BELIZE) BURIAL 1-9: TOMB OF AN ANCIENT MAYA RULER?

Excavations of Structure 1, the largest temple-pyramid at the Maya center of Pacbitun, Belize, revealed a deeply concealed, Late Classic period stone-lined tomb (Burial 1-9) with the human remains of an adult male. The substantial tomb construction, the central site location, associated offerings, and sumptuous grave goods collectively suggest not only high social status for the interred individual, but possible identification as a Maya site ruler. Comparison of Burial 1-9 with elaborate burials of reputed site rulers from other lowland centers is made.

*Heath-Smith, C. (see Smith, M.) [10]*

*Heidke, J. (see Miksa, E.) [36]*

*Heidke, James M. (Desert Archaeology) and Miriam T. Stark (Desert Archaeology)*

[42] STANDARDIZED THEORIES AND SPECIALIZED PRODUCTION: A VIEW FROM THE TONTO BASIN

Compositional analyses using quantitative petrography provides Desert Archaeology researchers with a basin-wide perspective for examining ceramic production in the early Classic period (Roosevelt Phase). Our research on local manufacturing traditions supports a model of intensive ceramic production during the early Classic period. Three aspects of productive specialization are explored: (1) how petrologically-based evidence for specialized production supports other compositional techniques; (2) whether extant models used to explain the ceramic patterning are appropriate; and (3) what types of material correlates are most useful for interpreting distributional patterning. Research directions regarding economic and social organizational issues in the Tonto Basin are then discussed.

*Helmuth, H. (see Healy, P.) [44]*

*Hempbill, Brian (Vanderbilt University)*

[90] WEAR AND TEAR: ANALYSES OF ARTHRITIS AND TRAUMA AMONG THE PREHISTORIC INHABITANTS OF THE MALHEUR LAKE WETLANDS

Recent recovery of 53 burials from the shores of Malheur Lake permit assessment of biocultural adaptation of prehistoric inhabitants from the northern Great Basin for the first time. Prevalence of osteoarthritis is high and reflects a demanding lifestyle for both sexes, but consistently higher frequencies of affection among males for most joints may indicate less habitual stress and mobility among females. Although the prehistoric inhabitants of Malheur Lake appeared to have enjoyed good health, traumatic injuries are common

(44%), and the majority of these injuries (64%) are the result of malevolent insult rather than accidental injury.

*Henderson, J. (see Beaudry-Corbett, M.) [71]*

*Henderson, T. Katbleen (Northland Research)*

[80] REFLECTIONS ON THE LATE CLASSIC PERIOD: A VIEW FROM THE SANTA CRUZ FLATS

During the A.D. 1300s, a number of Hohokam villages were established along the lower course of the Santa Cruz River. The proliferation of population along the river not only reflects a shift from previous settlement patterns, but also occurs at a time when communities to the south were abandoned. Moreover, whereas much of the Hohokam region was depopulated during the A.D. 1400s, archaeological data indicate that the Santa Cruz community continued to be occupied into the sixteenth century, if not later. This study explores the implications of these findings for understanding the Classic to post-Classic transition.

*Henry, D. (see Hietala, H.) [73]*

*Hensler, Kathy Niles (Arizona State)*

[42] SOCIAL BOUNDARIES SET IN CLAY: TRADE WARE PATTERNING IN THE TONTO BASIN OF EAST-CENTRAL ARIZONA.

Ceramic exchange reflects the socioeconomic ties of the individuals and groups who are party to the exchange. Distributions of trade wares are examined for the Classic Period in the Tonto Basin of central Arizona. Initially all of Tonto Basin appears to have relatively equal access to distant trading partners. By the 14th century, however, trade ware ceramics have differential distributions within the basin, suggesting that sites in the eastern end of the basin traded with different areas than sites on the western end of the basin. These differences may represent boundaries between competing polities in the same basin.

*Herbich, I. (see Dietler, M.) [51]*

*Herbabin, Cynthia L. (Arizona State)*

[17] FOURTEENTH CENTURY AGRICULTURAL DIVERSITY IN THE NORTHERN RIO GRANDE VALLEY, NEW MEXICO (1993 Winning Poster, Student Category)

Agricultural intensification between A.D. 1315 and 1425 in the Rio Grande Valley is evident in the dry farming features documented by the 1990 University of New Mexico field school. The features are located on a basalt mesa above a 14th century aggregated site and an area suitable for floodwater farming, suggesting that two different agricultural strategies were in simultaneous use by the community. The co-occurrence of the two strategies suggests the existence of a diversified agricultural system not often recognized archaeologically.

*Hernandez, G. (see Uruñuela, G.) [30]*

*Herscher, E. (see McManamon, F.) [38]*

*Hess, W. (see Ball, T.) [25]*

*Hester, Thomas (Texas-Austin)*

[87] AN INTRODUCTION TO STUDIES OF THE COLHA PRECERAMIC

Off-mound testing in 1988 at the Maya site of Colha, Belize led to the discovery of buried preceramic deposits. In 1990-1991, further testing, and studies of soils and pollen in Cobweb Swamp, confirmed the presence of human activities and agriculture ca. 2500-1000 B.C. In 1993, NSF-funded excavations clarified the stratigraphic and chronological contexts of these materials. The symposium reviews the ongoing research involving the Colha preceramic, and considers the implications of these data for studying the origins of lowland Maya culture.

*Hicks, Frederic (Louisville)*

[8] LATE PREHISPANIC XALTOCAN AND ITS EXTERNAL RELATIONS

Xaltocan figures frequently in the ethnohistorical sources on late prehispanic Mexico, although different accounts are not always in agreement. In the 13th century it headed a large kingdom, but after its fall to Azcapotzalco was briefly abandoned, then resettled under Mexican auspices. Throughout its history, its rulers and people entered into various kinds of relations with other polities; at different times they were allies, enemies, lords, vassals, and refugees. Examination of this diversity of external relations, and how they were constituted, helps us to understand the variety of forms that inter-polity relations in ancient Mexico could take.

*Hietala, Harold (Southern Methodist) and Donald O. Henry (Tulsa)*

[73] A PRELIMINARY INTERPRETATION OF DIACHRONIC SPATIAL PATTERNING AT THE MIDDLE PALEOLITHIC ROCKSHELTER OF TOR FARAJ, JORDAN

Comparisons of the spatial distributions of features, artifacts and other behavioral residue furnish insights as to the number of occupants, seasons of occupation and economic activities of the inhabitants of the



Middle Paleolithic rockshelter site of Tor Faraj in Jordan. Interpretations focus not only on temporally redundant but also on occupationally specific behaviors through the stratigraphic comparison of intrasite patterns between "living floors". In addition, these patterns are compared to those at the neighboring rockshelter of Tor Sabiha allowing a preliminary test of ideas concerning settlement/procurement patterns, mobility, site organization, modern behaviors and transhumancy.

**Hildebrand, John (Scripps Inst. Oceanography) and Melissa Hagstrum (Washington)**

**[61] RESPONSES TO SUBSISTENCE STRESS IN LATE PREHISTORIC SOUTHERN CALIFORNIA**

Responses to subsistence stress are examined for the late prehistoric Kumeyaay hunter-gatherers of interior southern California. Key subsistence stressors include the desiccation of Lake Cahuilla (post A.D. 1580), with subsequent loss of its lacustrine resources, and the permanent residency of Europeans (post A.D. 1769), with subsequent resource loss and native population displacements. Archaeological and ethnographic data provide the basis to test five potential responses to the stressors: (1) alteration of foraging practices, (2) increased storage, (3) increased sharing, (4) resource base expansion, and (5) exchange of subsistence resources for durable goods.

**Hildebrandt, William (Far Western Anthropological Research Group), Pat Mikkelsen (Far Western Anthropological Research Group), and Paul Bouey (Far Western Anthropological Research Group)**

**[83] LATITUDINAL VARIABILITY IN RESOURCE STRUCTURE: IMPLICATIONS FOR HUNTER-GATHERER ADAPTATIONS IN NORTHERN CALIFORNIA**

Several ethnographic models, covering a transect stretching from the California/Oregon border to the lower Sacramento Valley, indicate that northern groups relied more heavily on hunting and fishing than those in the south where plant resources comprised a larger percentage of the diet. The low frequency of projectile points recovered in the south appears to support these models. However, the near absence of toolstone in the region and a high degree of tool recycling are other factors affecting projectile point frequency, the latter producing strong implications regarding inter-regional variability in the utility of projectile points as chronological indicators.

**Hill, Jr., Matthew E. (Kansas), Matthew G. Hill (Wyoming), Jack L. Hoffman (Kansas), and Doug Drake (Texas-Austin)**

**[74] THE FAUNAL ASSEMBLAGE FROM THE MILNESAND SITE**

In 1953, E.H. Sellards directed excavations at the Milnesand site in Roosevelt County, New Mexico. Sellards and later researchers have taken a multidisciplinary interest in the Milnesand site, examining geomorphological, paleontological, and lithic artifact databases. Unfortunately, the analysis of the faunal remains from the site has been minimal. The present study is based on a recent examination of the curated bison remains from the Milnesand site. The primary focus of this study is the identification of skeletal element frequencies, herd composition, seasonality of occupation, and site formation processes. This research forms a baseline for comparing the Milnesand site to other Paleoindian bonebeds from the Plains.

**Hill, M. G. (see Hill, M. E.) [74]**

**Hill, Matthew G. (Wyoming)**

**[74] A NEW LOOK AT THE FOLSOM BISON BONEBED AT AGATE BASIN, WYOMING**

Reexamination of the Folsom bison bonebed excavated during 1978 and 1979 by the University of Wyoming at the Agate Basin locality is discussed employing contemporary methods of bonebed analysis. Rapid burial and favorable soil conditions provided excellent documentation of Paleoindian butchery and non-human modifications to the bison remains in the Folsom level. Cutmark and impact fracture locations suggest bison carcasses were disarticulated, defleshed, and some limb bones subsequently processed for marrow. Also, there are indications that hideworking may have been an important activity at the site. These data are examined in the broader framework of Paleoindian bison hunting and subsistence and site formation processes on the northern Plains.

**Hilton, M. (Geovision Consultants) and D.E. Strong (Baron Archaeological Institute)**

**[69] CONDUCTIVITY STUDIES AT MEZHIRICH, 1993**

During the 1993 field season at Mezhrich an extensive and intensive conductivity survey was conducted at the site. The purpose of this non-invasive survey was to locate and establish the conductivity and in-phase signature of deeply buried cultural features such as dwellings, pits, and bone accumulations of various dimensions. The results of this work conclusively indicate the high potential of this method not only at Mezhrich but also, by extrapolation, at other deeply buried loessic sites on the East European Plain. The methodology and results of the 1993 conductivity survey are presented in graphic form using state-of-the-art data processing and presentation techniques.

**Hitchcock, Robert (Nebraska-Lincoln) and Peter Bleed (Nebraska-Lincoln)**

**[84] EACH ACCORDING TO NEED AND FASHION: SPEAR AND ARROW USE AMONG IKUNG HUNTERS OF THE KALAHARI**

Advances in projectile point interpretation have made it easy to understand behavioral implications of the alternatives represented by spears and arrows, their characteristic applications, and their associated payoffs. This paper describes the hunting methods of Ju/'hoansi (!Kung), Botswana. The advantages, disadvantages, and success rates of spear and bow hunting are considered to show that decisions about the use of different types of weapons depend on assessments of such factors as seasonality, prey type, the habitat to be hunted, and the use of poison.

**Hockett, Bryan (Bureau of Land Management)**

**[61] THE LEPORID BONES FROM HOGUP CAVE, UTAH: IMPLICATIONS FOR UNDERSTANDING PREHISTORIC HUMAN ECOLOGY IN THE EASTERN GREAT BASIN**

A total of 18,208 provenienced leporid (cottontail and hare) bones recovered from Hogup Cave were analyzed. Approximately 2% of the assemblage bore clear evidence of human modification, and approximately 8% bore clear evidence of nonhuman modification. Raptors probably modified the majority of the latter bones. The culturally modified leporid bones were treated in a similar fashion throughout the depositional history of the cave. These data possibly could be used to support models which argue that the ancestors of the historic Numic-speaking peoples have occupied the Great Basin for many thousands of years.

**Hodge, Mary G. (Houston-Clear Lake) and Hector Neff (Missouri)**

**[8] CERAMIC PRODUCTION, TRADE, AND POLITICAL RELATIONS IN POSTCLASSIC XALTOCAN**

We explore the influence of political affiliation on Xaltocan's economy through a combination of ceramic stylistic and compositional data, stratigraphic evidence, and C-14 dates. We have identified stages in Xaltocan's local production of Black-on-Orange, the most well-known Postclassic Basin of Mexico ceramic type, within the context of the regional ceramic sequence and have investigated the effects of changes in political status on Xaltocan's exchange patterns by correlating sources of imported ceramics with Xaltocan's political and dynastic history.

**Hoffecker, J. (see Moeller, K.) [63]**

**Hoffecker, John F. (Argonne National Laboratory), Robin L. Burgess (U.S. Air Force), and Gennady Baryshnikov (Russian Academy of Sciences)**

**[94] GEOARCHAEOLOGY AND ZOOARCHAEOLOGY OF A MOUSTERIAN CAVE IN THE NORTHWESTERN CAUCASUS (RUSSIA)**

Mezmaiskaya Cave is a limestone solution cavern located at an elevation of 1350 m asl in the northwestern Caucasus. Preliminary excavations by L.V. Golovanova (who discovered the site in 1987) have uncovered several Mousterian occupation layers dated (AMS radiocarbon) to 35,000-40,000 years B.P. and earlier. Information derived from analysis of sediment samples, in conjunction with paleobiotic data (especially rodent remains and pollen/spore samples), permits integration of site geology with Late Pleistocene stratigraphy. Analysis of medium and large mammal remains (some of which exhibit stone tool cuts) indicates that steppe bison, goats, and sheep were hunted by the Mousterian occupants of the cave.

**Hoffman, B. (see Maschner, H.) [47]**

**Hoffman, Christopher R. (California-Berkeley)**

**[12] MAKING METAL, MAKING CULTURE: THE COPPER AND BRONZE AGES IN MALLORCA, SPAIN**

Between the Copper and Bronze Ages on the island of Mallorca (Spain), there are significant changes in the procurement, production, distribution, use and deposition of metal artifacts. Evidence for these activities from five neighboring sites is presented. The goal is to demonstrate how metallurgy was actively involved in social organization at the site and regional levels.

**Hoffman, Kathleen (Florida Museum of Natural History) and Kathleen A. Deagan (Florida Museum of Natural History)**

**[101] FRANCISCANS, THE SPANISH COMMUNITY, AND NATIVE AMERICANS IN 17TH CENTURY ST. AUGUSTINE**

The Convento de San Francisco, a Franciscan monastery located in St. Augustine, served as the headquarters for the Franciscan mission effort in *La Florida* during the sixteenth and seventeenth centuries. It functioned as a guest house for visiting officials, a training center for new friars, and as a hospice. The friary also played a vital role as an intermediary between the outlying missions and the secular community of St. Augustine. Excavations at the Convento de San Francisco are clarifying the interactions between the Franciscan community, the presidio of St. Augustine, and the Native Americans.

**Hoffman, Michael P. (Arkansas)**

**[78] ONEOTA CULTURE TIES TO THE HISTORIC QUAPAW TRIBE**

If the Dhegaha Siouan speaking Quapaw tribe migrated from the Midwest to the mouth of the Arkansas River in late Mississippi or protohistoric times as their oral traditions relate, then Midwestern Oneota or Oneota-related manifestations should indicate the relationship. Brief examinations of collections and archeological records from the Utz site, sites of the Bold Counselor phase and sites of the Caborn-Welborn phase were made to discern the presence of Quapaw archeological correlates. The Utz site has the highest degree of similarity.

**Hoffman, T. (see Lincoln, T.) [50]**

**Hofman, J. (see Hill, M. E.) [74]**

**Hofman, Jack L. (Kansas)**

**[74] THE SIGNIFICANCE OF FOLSOM POINT VARIABILITY: EVIDENCE FROM THE FOLSOM AND LIPSCOMB SITES**

Stone tools commonly serve as "cultural markers" in Paleoindian research and are used as the "independent" variable in making assemblage, stratigraphic, chronometric, ecological, and economic comparisons between Paleoindian sites. The pivotal role which Paleoindian projectile points hold in interdisciplinary research (e.g., evaluation of radiometric dated, assemblage comparisons, and study of socio-economic change) requires that we critically re-assess the meaning and uses of Paleoindian point types. Toward this end, variability in the Folsom point type is addressed here and the significance of this variability for spatial and diachronic comparative studies is emphasized.

**Hobmann, B. (see Pows, T.) [60]**

**Hobmann, John W. (Louis Berger & Associates)**

**[19] ARCHITECTURAL INSIGHTS FROM STABILIZATION PROGRAMS**

In the American Southwest, the call for prehistoric stabilization programs is increasing. Therefore, a secondary benefit is emerging: Additional detailed architectural information. The exposure of different structural aspects of prehistoric sites by stabilization activities has yielded a substantial set of data regarding architectural variability. This new source has the potential to yield significant new insights for issues of structural configuration and prehistoric site growth. Recent work undertaken at the Homolovi Ruins, a series of large, late prehistoric Southwestern Pueblos, will be used as an example of the type of architectural information which can be gleaned from such stabilization programs.

**Hole, Frank (Yale University) [Discussant 24]**

**Holland, J. (see Smith, K.) [88]**

**Hollinger, Eric R. (Loucks and Associates, Inc.)**

**[78] ONEOTA DOMESTIC ARCHITECTURE AND THE SEARCH FOR RULES OF RESIDENCE**

Changes through time in the size of Oneota houses support the hypothesis that rules of post-marital residence shifted from patrilocal/virilocal to matrilocal/uxorilocal during the prehistoric period and then returned to patrilocal with the advent of European contact. The mean floor areas of Emergent, Developmental and Historic horizon houses are small, corresponding to expectations generated from cross-cultural studies of patrilocal societies. Floor areas during the Classic horizon were very large and compare favorably with those of matrilocal societies. The identification of patterns of residence provides insights into prehistoric social structure, the causes of social change and the sequence of those changes.

**Holmes, Charles (Office of History and Archaeology, Alaska) and Richard VanderHoek (Illinois-Urbana)**

**[30] SWAN POINT: A MULTICOMPONENT SITE IN THE TANANA VALLEY, CENTRAL ALASKA**

Swan Point data are helping refine current archaeological models for central Alaska. Occupations are assignable to Northern Paleoindian and Northern Archaic complexes, e.g., Chindadn, Nenana, Tuktu, and Denali. The basal cultural level, AMS dated to 11,600 B.P., contains blades, microblades, bifacial tools, and dihedral burins associated with worked tusk (mammoth?) fragments. These data are among the earliest stone tool assemblages known for eastern Beringia. Distinctive triangular bifaces, date to c. 10,200 B.P., resemble Chindadn or Nenana complex forms. Notched points appear clearly associated with microblade and burin technology that is hypothesized to date 5,000 B.P.

**Holmlund, James (Geo-Map, Inc.)**

**[86] THE RIPLEY GEOGLYPH COMPLEX: A CASE STUDY OF GEOGLYPH SITE STRUCTURE AND FEATURE RELATIONSHIPS**

This paper presents the results of the 1992 Ripley Geoglyph Complex survey: 510 features and 15 km of trails were identified on three topographically distinct terrace systems within the study area. Based on

the spatial distribution of feature types and feature density, it was concluded that the local physiography and concentration of essential resources played an important role in the location of certain feature types (those that may have related to social or ceremonial activities such as geoglyphs and rock alignments), but only a minor role in the distribution of other features.

**Holson, John (BioSystems Analysis)**

**[11] MEASURING THE EFFECTS OF ACCULTURATION IN THE ARCHAEOLOGICAL RECORD: THREE CASE STUDIES**

This paper will examine the intensity of Native American and Euro-American contact using materials excavated from three ethnographic sites in California. The sites to be discussed are chosen for their proximity to Euro-American interaction spheres and represent the Spanish American and Settler Periods prior to 1850. Comparisons will be drawn from the materials collected at the sites and the predicted results based on ethnographic accounts of Native Californian and Euro-American contact. The study will show that there is variability in the amount, type and quality of Euro-American goods found at Native Californian sites which may indicate the degree of Euro-American material culture acceptance and use by indigenous people.

**Hommon, Robert J. (National Park Service, Pacific Area Office)**

**[99] EMERGENT COMPLEXITY IN ANCIENT HAWAII**

Complex adaptive systems theory is applied to indigenous Hawaiian sociopolitical evolution, considered as a process involving interactions between bipolar phenomena such as self-organization and adaptation, hierarchy and heterarchy, stability and change, and chaos and order. The original settlers of Hawaii carried their sociocultural system in highly condensed form, the set of relatively simple rules of the Polynesian ramage or conical clan. The co-evolving states of 18th century Hawaii can be seen to have emerged from the interaction between these local rules of self-organization and non-linear responses to natural and cultural environmental stimuli.

**Hoopes, John (Kansas)**

**[32] CONTRIBUTIONS OF NON-AGRICULTURAL SUBSISTENCE STRATEGIES TO THE FORMATION OF COMPLEX SOCIETIES IN COASTAL ZONES OF SOUTHERN COSTA RICA**

Social complexity in large, late prehistoric demographic centers of southern Costa Rica was conditioned by antecedents in earlier sedentary villages. Traditional models have emphasized the adoption of maize as a staple as a crucial step towards complexity. However, data from coastal zones of the Golfo Dulce, Costa Rica indicate that communities not dependent upon maize played a key role in structuring relationships of centralization and specialization. This paper presents a detailed reconstruction of coastal subsistence strategies from organic remains at Costa Purruja that emphasizes the contribution of offshore and estuarine resources to the *in situ* evolution of complex social systems.

**Hoover, Robert (California Polytechnic State-San Luis Obispo) [Discussant 101]**

**Hopkins, Mary (Brandels)**

**[30] SCALE OF PRODUCTION AND PRODUCT STANDARDIZATION IN TEOTHUACAN COOKING POTS**

Classic Teotihuacan cooking pots made in two wares, Burnished (many forms, scattered small-scale production) and San Martin Orange (few forms, centralized large-scale production) are compared in terms of standardization at all stages of the production sequence: clay selection, paste preparation, forming, finishing, and firing. The effects of scale of production on uniformity vary considerably from one manufacturing stage to another. Large scale can result in increased consistency, fast sloppy work, or in major but inconsistent technical improvement. All of these can often be seen on one pot.

**Horne, Melinda (INFOTEC Research) and Judith A. Willig (INFOTEC Research)**

**[83] 35-JE-49: TEN THOUSAND YEARS OF HUMAN OCCUPATION AND ADAPTIVE CHANGE**

Site 35-JE-49, adjacent to Mud Springs Creek in north-central Oregon, contains the longest record of human occupation of all sites investigated along the Pipeline Expansion Project (PEP) corridor. A residential base camp, 35-JE-49 contains discrete lithic reduction loci, numerous rock features, and a deeply stratified rockshelter with abundant and varied cultural assemblages reflecting subsistence reliance on both faunal and floral resources. Geoarchaeological examination of the shelter's sediments indicate at least eight distinct periods of aboriginal occupation which correspond with buried paleosols, vertical increases in artifacts and faunal remains, and 25 distinct hearth/midden/pit features. Chronometric data support an occupation from 9980 ± 355 years B.P.

**Hoshower, Lisa**

**[101] BIOANTHROPOLOGICAL ANALYSIS OF A SEVENTEENTH-CENTURY NATIVE AMERICAN MISSION POPULATION**

The biological and cultural consequences of the seventeenth-century Spanish mission system for the native inhabitants of *La Florida*, with particular emphasis on the northern Utina, a Western Timucuan



speaking group from present-day Florida, are discussed. Archaeological, ethnohistorical, and bioanthropological analyses of pre-Columbian and mission-period northern Utinan skeletal collections demonstrate that the transition to mission life was marked by severe alterations in aboriginal lifeways. These changes were accompanied by increases in infectious diseases, nutritional deficiencies, and morbidity and mortality. Observed trends in disease prevalence illustrate the detrimental effects of the Spanish mission system on these Native American populations.

*Houston, Stephen (Vanderbilt University)*  
[67] ANCIENT MAYA ARCHITECTURAL SPACE

Recent archaeological, iconographic, and epigraphic research points to novel understandings of Classic Maya architecture as a devised environment. This paper presents a variety of approaches and sets of evidence, but focuses especially on emic concepts in the use and selective depiction of architectural space. Images from the Classic period reveal how built spaces were shown, and what the Maya thought to be important about them.

*Hovey, Kevin (California-Riverside) and Scott L. Fedick (California-Riverside)*  
[5] ANCIENT MAYA SETTLEMENT IN THE YALAHAU REGION OF NORTHERN QUINTANA ROO

The extensive freshwater of the Holbox Fracture Zone represents a unique setting for settlement and land use within the northern lowlands. Systematic and reconnaissance survey has identified associations between forms of domestic architecture and types of land and water resources. Many of the wetlands in the study area are ringed by dense settlement, suggesting intensive use of these resources. Possible uses of the wetlands for agriculture and other economic pursuits are discussed, and a model of settlement pattern within the zone is proposed. The broader economic implications of the wetland zone are discussed within the context of the northern lowlands.

*Howard, Jerry B. (Mesa Southwest Museum and Arizona State) and Charles Glass (Arizona)*  
[26] SOCIAL AND BEHAVIORAL IMPLICATIONS OF PLATFORM MOUND ARCHITECTURE: THE MESA GRANDE CASE STUDY

Recent research on Platform mounds has prompted diverse functional interpretations and new theoretical directions. Analysis of architectural design has played a dominant role in these discussions. Architecture is used to organize space, control and limit access and choreograph activities at the mound. This paper describes a series of new techniques and methodological approaches applied to the architectural analysis of the Mesa Grande, one of the two largest Hohokam platform mounds. The use of ground penetrating radar technology to locate possible features and for hypothesis testing is discussed. Several new architectural elements of Hohokam platform mounds are presented and discussed.

*Howe, Kate (Florida State)*  
[29] PAN-MESOAMERICAN IMAGERY IN THE POST-TEOTIHUACAN ERA

Recent studies in Pan-Mesoamerican iconographic motifs provide insights into the core-periphery status of the lowland Maya and its interconnectedness with the Basin of Mexico after the collapse of Teotihuacan. This paper focuses on the meaning of such cross-cutting images when viewed through a world systems perspective. A concluding section examines problems which must be addressed when interpreting pan-Mesoamerican iconographic elements and offers suggestions for future research.

*Howell, Todd (Arizona State)*  
[80] THE HOHOKAM CLASSIC TO POST-CLASSIC TRANSITION: A VIEW FROM LOS GUANACOS

Selected data recovered from the Hohokam settlement of Los Guanacos are used to examine cultural change during the Classic and post-Classic periods. A brief description of the site and a seriation of selected features is presented. Two models are then tested that seek to explain the abandonment of Los Guanacos (and perhaps the Hohokam Region in general). One model posits a collapse of the canal system and the second suggests that local environmental degradation prompted site abandonment. Specific test implications are used to examine differences between the Classic and post-Classic occupations.

*Hudler, Dale B. (Texas-Austin) and Jon C. Lobse (Texas-Austin)*  
[87] A FUNCTIONAL AND CONTEXTUAL STUDY OF UNIFACIAL CHERT TOOLS FROM BELIZE

Distinctive unifacial chert tools have been surface collected from a broad area of Belize since 1980 and have also been found in excavations at Colha and Pulltrouser Swamp. A preliminary analysis of these tools was done in 1982 using 23 surface-collected specimens. The unifaces were thought to be woodworking tools dated approximately 4000-7000 B.P. In 1993, a broader effort was begun to determine function and context. This included an experimental program in Belize and contextual data from excavations at Op. 4046 at Colha. New wear data are now available on these tools, recently dated at 3000-3300 B.P.

*Hudson, Jean (California-Los Angeles)*  
[36] INTRASITE SPATIAL ANALYSIS: ETHNOARCHAEOLOGICAL DATA FROM AKA FORAGERS

Ethnoarchaeological data from tropical forest foragers, the Aka of the Central African Republic, are presented. Relationships between number of households, number of individuals, number of hearths, types

of structures, camp area, duration of occupation, and subsistence focus are examined using mapped data from more than 60 camps. A smaller data set is used to examine relationships between hut dimensions, family size and composition, and average body size, and between relatedness, hut location and hut spacing. These data are compared with published data for other groups and hypotheses of archaeological relevance concerning interpretation of group size and site function as reviewed.

*Hughes, R. (see Cannon, K.)* [105]

*Hughes, Richard E. (Geochemical Research Laboratory) and Craig E. Skinner (INFOTEC Research)*

[83] VARIABILITY IN OBSIDIAN SOURCE USE IN CENTRAL OREGON

The geologic sources for more than 6,500 obsidian artifacts from 84 archaeological sites in the PGT-PG&E Pipeline Expansion Project have been determined using x-ray fluorescence spectrometry. Although numerous artifact-quality glass sources exist within the potential procurement spheres of these sites, only a limited number of these obsidians were extensively exploited prehistorically. In this paper, we examine the spatial distribution of obsidian from major sources and provide a preliminary assessment of diachronic and synchronic variability in source use as monitored by time-sensitive artifact types and obsidian hydration rim measurements.

*Hunt, Terry (Hawaii-Honolulu)* [Discussant 6]

*Hunt, Terry (Hawaii-Honolulu)*

[79] NIHOA ISLAND: COLONIZATION, ENVIRONMENTAL CHANGE, AND ISOLATION ON A HAWAIIAN FRONTIER

The diminutive Island of Nihoa lies 240 km northwest of the main Hawaiian Islands. The island was intensively occupied, then abandoned prior to European re-discovery in 1790. Polynesian occupation on Nihoa was late, of short duration, and brought significant change to the indigenous flora. In this paper I examine the evidence for the nature and chronology of settlement and human-associated environmental change. I consider the isolated position of the island and the implications for Hawaiian prehistory.

*Hunter, Andrea A. (Northern Arizona)*

[78] THE DOMESTICATION OF *HORDIUM PUSILLUM* (LITTLE BARLEY) IN THE MIDWEST UNITED STATES

A morphometric analysis of archaeological *Hordeum pusillum* and ethnographic research was conducted to evaluate the utilization of this plant. A comparison of criteria delineated for the domestication of Old World *Hordeum* spp. allowed for the identification of three specific morphological changes. *Hordeum pusillum* caryopses exhibit two of these changes. Using Rindos' Darwinian model of domestication, it was determined that incidental domestication occurred during the Middle and Late Archaic, specialized domestication during the Terminal Archaic/Early Woodland, incipient agricultural domestication during the Middle and Late Woodland, and thereafter a sharp decline occurred resulting in a remnant form of incipient agricultural domestication.

*Hunter-Anderson, R. (see Ambrose, S.)* [54]

*Hutchinson, D. (see Larsen, C.)* [90]

*Hyland, David C.*

[69] ENZYME IMMUNOASSAY (EIA) STUDIES ON SELECTED LITHIC ARTIFACTS FROM MEZHIRICH

Enzyme immunoassay (EIA) scrutiny of a selected suite of lithic artifacts from Mezhirich has revealed the presence of non-hemolyzed blood attributable to Late Pleistocene food procuring and/or processing activities. The EIA method is described and discussed and the results of the analysis are related in terms of technology, scenarios of subsistence, and food processing in mammoth-bone settlements on the East European Plain.

*Hyland, J. (see Gutiérrez, M.)* [57]

*Hyland, Justin R. (California-Berkeley) and Maria de la Luz Gutiérrez (Centro Regional del Instituto Nacional de Antropología e Historia, La Paz, Baja California Sur, Mexico)*

[57] PREHISTORIC MOBILITY AND SUBSISTENCE IN THE SIERRA DE SAN FRANCISCO, BAJA CALIFORNIA SUR, MEXICO

As an integral part of the Proyecto Arte Rupestre Sierra de San Francisco, Baja California Sur, Mexico a stratified regional survey and limited test excavations were carried out in order to assess the temporal and functional position of Sierra de San Francisco mural sites in the overall prehistoric settlement pattern. Survey results and excavation data from type sites, including excavation data from the mural sites of Cueva Pintada



and Cueva Soledad, are presented. Implications for evaluating overall seasonal mobility and resource scheduling and the specific case for aggregation at mural sites are discussed.

Hyman, M. (see Rowe, M.) [103]

Ibarra-Morales, E. (see McClung de Tapia, E.) [8]

Iceland, Harry (Texas-Austin)

[87] COLHA PRECERAMIC PROJECT: EXCAVATIONS AND STRATIGRAPHY

The Colha Preceramic Project carried out excavations in Spring 1993 at Operation 4046, where previous testing had revealed buried preceramic deposits. A 4x6 meter blow was opened on the edge of a Maya mound located next to an *aguada*. Four distinct stratified zones were identified, the lower two (Zones C and D) representing preceramic occupations. The zones contained distinctive chert lithic assemblages. Zone C, radiocarbon-dated between 1100-1300 B.C., may be linked to early agricultural activities at Cobweb Swamp about 100 meters to the southeast.

Ingmundavsson, J. (see Amorosi, T.) [79]

Inomata, Takeshi (Vanderbilt University)

[60] ARCHAEOLOGICAL INVESTIGATIONS AT AGUATECA, GUATEMALA: THE STUDY OF A FORTIFIED MAYA CENTER

Archaeological investigations at the site of Aguateca, El Peten, Guatemala, have revealed an extensive and complex defensive wall system. The fortifications date to the end of the Late Classic Period (late 8th century), suggesting the intensification of warfare. In particular, the excavations of elite structures have demonstrated the abrupt abandonment of the center, which was probably caused by the attack of enemies. These new data imply the significance of warfare regarding the collapse of Classic Maya civilization.

Irisb, J. (see Regan, M.) [98]

Isbell, William (SUNY-Binghamton)

[14] KINGSHIP TO KINSHIP: HUARI AND THE RISE OF THE AYLLU

Between the 9th and 10th centuries, the Huari polity collapsed and its capital city was abandoned. Climatic change has been invoked to account for the failure of Huari, as has population replacement, perhaps through militaristic invasion of the heartland. Research in the prehistoric capital shows that while depopulation was fairly rapid, it was neither quick nor disruptive enough to support military invasion or acute natural disaster. Alternatively, new data regarding the relationship of open mortuary monuments, ancestor cults, and *ayllu* organization may be revealing powerful, kin-based resistance to state construction and reconstruction in Middle Horizon 2 Huari. I suggest that internal resistance may have played a key role in the failure of Huari's centralization of power.

Jackson, T. (see Stevenson, C.) [8]

Jacob, J. (see Goldberg, P.) [87]

Jacob, J. (see Pope, K.) [76]

Jacobi, K. (see Havill, L.) [106]

Jacobi, Keith (Indiana University)

[106] MORTUARY PATTERNS AT THE SPANISH-MAYA MISSION AT TIPU BELIZE

The site of Tipu in Belize includes a visita mission that was used from 1540 to 1638 A.D. Buried beneath and surrounding this Spanish-Catholic church were 518 individuals who are thought to be Maya. Analysis of the dental remains using non-metric traits allows for a more personal view of life at contact, comparison with known Spanish-Catholic burial practices, tests concordance with church recruitment procedures, and assesses the influx of Maya refugees. In addition, results indicate a sex division of burials within the church and the computer program MacClade has revealed family relationships within the cemetery.

Jacobs, D. (see Rice, G.) [98]

Jacobs, David (Arizona State) and Glen Rice (Arizona State)

[26] LABOR INVESTMENTS AND ROOM FUNCTION AT THE CLINE TERRACE MOUND

The Cline Terrace Mound, a Salado platform mound in Tonto Basin, was occupied throughout the late Classic, and underwent a series of expansions. When estimates of the labor involved in these construction efforts are compared to the number of rooms and their function, it suggests the use of populations not residing at the site as a labor source. The Cline Terrace Mound also differs in other ways (e.g., amount of space devoted to storage, residences) from the contemporary Schoolhouse Mound. The implications of these differences in mound types are discussed.

Jabren, Hope (California-Berkeley), N. Toth (Indiana), K. Sbick (Indiana), J. D. Clark (California-Berkeley), and R. G. Amundson (California-Berkeley)

[25] PHYTOLITH AND OTHER RESIDUE ON STONE TOOL SURFACES: EXPERIMENTAL RESULTS FROM BAMBOO AND BONE PROCESSING

We investigated stone tool surface-residues acquired in bamboo and bone processing, and that surface residues on tools obtained from the field may provide information on food availability and processing technologies. Chert tools were experimentally manufactured and used for bamboo shredding, bone scraping, or left pristine. Scanning electron microscopy (SEM) was performed on all tool surfaces. Tools bearing bamboo residue exhibited bundles of hair-like bamboo phytolith. Tools were soaked in 35% H<sub>2</sub>O<sub>2</sub> for 24 hours to simulate effects of burial and diagenesis. SEM/EDAX elemental analysis was invoked to distinguish the phosphate-based bone residue from the silica-based bamboo residue.

James, Steven R. (Arizona State)

[46] DEPLETION OF ANIMAL RESOURCES IN PREHISTORIC AGRICULTURAL SOCIETIES: COMPARISONS BETWEEN THE AMERICAN SOUTHWEST AND PACIFIC ISLANDS

Archaeologists have the advantage and potential for examining both short-term changes and long-term trends in animal over-exploitation. Data from recent studies in both the American Southwest and Pacific Islands are examined in terms of four interrelated aspects: overhunting, habitat destruction, impact of introduced species, and chains of extinctions. Polynesian chiefdoms brought about extinctions of numerous land birds, whereas Hohokam and Chacoan societies caused resource depletion of various game and fish. Differences are viewed as ones between islands and continents and not technological or sociopolitical levels.

Janusek, J. (see Seddon, M. T.) [43]

Janusek, John W. (Chicago) and Sonia Alconini (Universidad Mayor de San Andres)

[43] SOCIAL DIVERSITY AND HISTORICAL CHANGE IN TIWANAKU CERAMICS: STEPS TOWARD A TIWANAKU IV-V CHRONOLOGY

For years now our understanding of prehispanic social formations in the southern Andes has suffered for lack of a detailed regional chronology. This study presents the results of an intensive ceramic analysis carried out between 1991 and 1993, covering numerous areas of excavation at the sites of Tiwanaku and Lukurmata in the southern Titicaca basin. Our analysis compared several distinct contexts at the two prehispanic urban centers, including ceremonial, elite, specialized, and household areas. The results indicate that many traditional assumptions regarding the chronology of Tiwanaku vessels, and regarding the nature of the Tiwanaku polity in general, require re-examination.

Jenkins, L. (see Watkins, J.) [38]

Jochim, Michael (California-Santa Barbara) [Discussant 56]

Jochim, Michael (California-Santa Barbara) [Discussant 45]

Jochim, Michael (California-Santa Barbara)

[27] CHANCE AND CONTEXT IN EVOLUTIONARY CHANGE

Evolutionary thinking in archaeology is dominated by an emphasis on natural selection, to the neglect of other forces of evolution. This emphasis carries with it an implicit assumption of behavioral plasticity—that selection can shape behavior to any optimal end—with the implication that evolutionary change is regular and predictable. Recent work acknowledges the role of history and chance in constraining and affecting behavioral change, but it has been difficult to incorporate them into theoretical constructs. This discussion focuses on the role of chance in evolutionary change and on how we can accommodate this factor in our theoretical formulations.

Johnson, Boma (Bureau of Land Management)

[86] THE ARCHAEOLOGY OF THE LOWER COLORADO RIVER: AN OVERVIEW

An overview of the archaeology of the lower Colorado River is presented on three related levels. First, a brief resume of the history of research is discussed; second, a review of the types of resources and research that have characterized the archaeology of the lower Colorado River in recent years is presented; and third, recent discoveries and new directions in research, including lithic technology and the interconnectedness of ethnology and archaeology, is considered. This paper advocates a greater relationship between the archaeological record, the ethnographic record, and the remaining knowledge the native peoples hold about their own past cultural experience.

Johnson, John R. (Santa Barbara Museum of Natural History)

[11] CHUMASH SOCIOPOLITICAL ORGANIZATION DURING THE LATE EIGHTEENTH AND EARLY NINETEENTH CENTURIES

Chumash society was greatly impacted by Spanish colonization beginning in the late nineteenth century. Missionization and a cataclysmic population decline led to the demise of old socio-political forms. Fragmentation and a

tary ethnohistoric and ethnographic data have been subject to varying interpretations by a number of different researchers regarding the nature of Chumash social structure and level of sociopolitical integration. Recent analysis of mission register data and evidence in J. P. Harrington's ethnographic fieldnotes allows a more complete picture of Chumash society to emerge. The interplay of demographic, geographic, economic, and social network variables account for the configuration of Chumash sociopolitical institutions and the subsequent changes that took place during the Mission Period.

*Johnson, K. (see Allen, M.)* [6]

*Johnson, Lucy Lewis (Vassar College)* [Discussant 41]

*Johnson, Lucy L. (Vassar College)*

[35] AN ALEUT RESIDENCE ON CHERNABURA ISLAND, ALASKA

The Aleuts dug semi-subterranean houses both as protection from the cold climate and to conserve scarce building materials. In the summer of 1993, we completely excavated one such house at site XSI-040 on Chernabura Spit in the Shumagin Islands south of the Alaska Peninsula. Several house floors were marked both by artifact concentrations and the placement of large rocks and small boulders around their perimeters. Features recognized can be compared to those found at both residential and ceremonial structures at other Aleut sites.

*Johnson, Matthew (Durham, England)*

[62] 17TH CENTURY SURVEILLANCE

It is the argument of this paper that the genealogy of many of the practices Foucault assembles under the term "panopticism" may be traced back to early modern England. I examine a range of archaeological and documentary artifacts of surveillance and discipline from this period. Architecture becomes governed by rules of segmentation and functional differentiation, a tool of bodily discipline. Parks and gardens are laid out along geometrical principles and lines of sight that privilege the elite viewer. Most fundamentally, basic farming practices become subjects of principles of "closure" which transform the landscape and labor practices of human subjects alike.

*Johnson, P. (see Solimano, P.)* [18]

*Johnson, William Gray (Desert Research Institute)*

[75] NUCLEAR TESTING AND COLD WAR STUDIES: HISTORIC STRUCTURES AT THE NEVADA TEST SITE

Nuclear testing is one of the historical contexts in the Nevada Comprehensive Preservation Plan. As a recognized historical context, it is considered an integral part of U.S. Cold War history. A recent survey of Nevada Test Site structures and objects associated with nuclear testing has yielded important information on the variety and scope of these cultural resources. This paper provides interpretations of these resources within an archaeological framework and provides management considerations derived from the survey.

*Johnston, Kevin (Yale University)*

[60] OUT OF SIGHT, OUT OF MIND: "INVISIBLE" RESIDENTIAL SETTLEMENT IN THE CLASSIC MAYA LOWLANDS

Most Maya settlement analyses rest on the assumption that the full range of ancient Maya dwelling types, and, by inference, the remains of all social and economic groups, are represented by visible mounds. In fact, data indicate that "invisible" residences (nonmounded structures that leave no surface trace) were ubiquitous in the Maya lowlands. That this has not been widely recognized is attributable to two factors: (1) inter-regional environmental variations that affect the archaeological perception of structure "visibility;" and (2) inconsistencies in the nomenclature used to describe "invisible" dwellings. Architectural attributes common to "invisible" houses are employed to devise a formal typology of pan-lowland "invisible" Maya residential settlement.

*Jolly, K. (see Black, S.)* [19]

*Jones, G. (see Beck, C.)* [96]

*Jones, J. (see Pohl, M.)* [76]

*Jones, J. (see Pope, K.)* [76]

*Jones, John G. (Smithsonian Tropical Research Institute, Panama)*

[87] SETTLEMENT AND AGRICULTURE AT COLHA: POLLEN EVIDENCE FROM COBWEB SWAMP

Analysis of pollen samples from Cobweb Swamp, part of the Maya site of Colha, has revealed a complex settlement record quite different than that known from archaeological excavations. Evidence of humans extends to before 6000 B.C., while periods of forest clearing and the cultivation of domesticated plants are clearly recorded. A distinct early horizon contains evidence of manioc, but no other cultigens. In Maya

levels, however, there is a dramatic shift to intensive maize cultivation, along with cotton and probably chilies. Wild fruit trees were spared by the Maya, though ramon was not selectively maintained.

*Jones, Robert (Desert Research Institute) and Harold Drollinger (Desert Research Institute)*

[37] DISTRIBUTION OF LITHIC MATERIAL ON PAHUTE MESA, SOUTHWEST GREAT BASIN

The spatial distribution of raw material sources on Pahute Mesa is presented. A variation in the types of raw materials and their spatial distribution is evident. A change in the use of various raw materials through time reflects a change to a greater use of local raw materials sources in the later periods. The variation in the distribution and the change through time of raw materials reflect on the subsistence and mobility patterns for the area.

*Jordán, Juan Albarracín (Instituto Nacional de Arqueología, Bolivia)*

[85] INTEGRATION AND DISINTEGRATION: TIWANAKU'S COLLAPSE AND LOCAL NESTED HIERARCHIES

The Tiwanaku polity (A.D. 400-1100) extended its influence over a wide geographic area in the South-Central Andes, integrating local cultural diversity into a unified system of complementarity. This enduring hegemony has been traditionally perceived as the manifestation of a highly centralized and bureaucratic state that monopolized labor and agricultural production for the sustenance of its urban loci and its expansionist agenda; apparently, the collapse of the administrative apparatus took place due to environmental perturbations in the core region that disabled agricultural production and, therefore, the maintenance of its ruling social stratum; new, local ethnic identities developed as a result.

*Joyce, Arthur (American Museum of Natural History)*

[55] IDEOLOGY, POWER, AND STATE FORMATION AT MONTE ALBAN

This paper uses an actor-based theoretical perspective to examine the origins and development of the Monte Alban polity during the Late/Terminal Formative (500 B.C.-A.D. 250). The key theoretical problem raised by the development of Monte Alban is to explain why non-elites moved to ecologically risky piedmont areas and increasingly provided resources to support an emerging elite faction. This trend is explained by the development of an elite strategy of social deception through ideological manipulation, which involved increasing control of ritual, promotion of external conflict, and development of an elite social identity.

*Joyce, Rosemary A. (Harvard University)* [Discussant 96]

*Joyce, Rosemary A. (Harvard University)*

[34] LOOKING FOR CHILDREN IN PREHISPANIC MESOAMERICA

Documents from 16th-century Central Mexico and Yucatan suggest that distinct developmental stages from infancy to adulthood were symbolized through costume. Individuals at different stages engaged in particular tasks, and transitions from stage to stage were marked by ritual. Because they affected material culture, these aspects of childhood have potential to be detected archaeologically. Variation by age of costume in burials of the Formative period is explored. The results are compared with an analysis of depictions of children in figurines. Implications of these data for children's impact on the archaeological record are considered.

*Judge, Christopher (Diacronic Research Foundation)*

[52] EVALUATING ELEMENTARY STUDENTS' PERCEPTIONS OF ARCHAEOLOGY

As archaeologists we often visit schools and give presentations; then we leave. Except in thank-you notes from the teachers, the impact of our lectures is seldom evaluated. From 1986 through 1992, students in a one-week summer archaeology camp were asked, as the first activity on the first day, to draw a picture of an archaeologist doing what an archaeologist does. These images were used to shape the nature of the week's activities. Hands-on activities and other multi-sensory experience appear to help dispel the students' myths and misconceptions about archaeology, and to leave a lasting impression on the students.

*Judge, W. James (Fort Lewis College)* [Discussant 42]

*Juel Jensen, Helle (Aarhus) and Berit V. Eriksen (Aarhus)*

[16] FOSSIL MOLLUSKS AND EXOTIC RAW MATERIALS IN LATE GLACIAL AND EARLY POSTGLACIAL FIND CONTEXTS: A COMPLEMENT TO LITHIC STUDIES

Numerous prehistoric hunter-gatherer sites from western Europe have yielded fossil mollusks or exotic lithics of "dispersed" origin. Many of these findings represent various kinds of long-distance connections. Keywords with respect to such relationships are mobility and communication. We argue that lithic raw materials used for tools, and fossil mollusks used for personal adornment, represent different expressions of mobility patterns and/or communication between groups. Based on a case study from Late Glacial and Early Postglacial Western Europe, we discuss the importance of stylistic analysis in the study of past hunter-gatherer behavior.



*Julien, Daniel G. (Texas-Austin)*

**[77] GRADUAL CHANGE AND CATASTROPHIC REALIGNMENT: THE EARLY INTERMEDIATE PERIOD AND AFTERWARDS IN CAJAMARCA**

Settlement patterns in the Cajamarca region of the North Highlands of Peru indicate a gradual process of growing political centralization during the Early Intermediate period. The major centers of both population and political power were located in the Andean intermontane valleys. Ceramic distributions suggest that through most of the period, Cajamarca interacted most intensively with neighboring highland regions, and had little, if any, interchange with the coastal Moche culture. With the end of the Early Intermediate period, the situation changed drastically. The coast-highland axis became dominant in Cajamarca's external relations, and the centers of population and political power moved to the western Andean slopes.

*Julien, Michèle (C.N.R.S. Laboratoire d'Éthnologie Préhistorique), Pierre Bodu (Laboratoire d'Éthnologie Préhistorique), and Boris Valentin (Laboratoire d'Éthnologie Préhistorique)*

**[16] FLINT ECONOMY IN SOME LATE PALAEO-LITHIC SETTLEMENTS OF THE PARIS BASIN (FRANCE)**

Of the several Late Palaeolithic sites of the Paris Basin, two types can be evidenced according to the economy of raw flint. Some, such as Etioilles or Donnemarie, situated near Lutetian deposits containing voluminous flint blocks of an excellent quality, are mainly workshops where blade production was aimed to an extra-site use. Others, such as Pincevent and Marolles, settled near river banks where Senonian medium size flint nodules of plain quality were available, are more related to hunting activities (reindeer, horse) and the knapping activity was subordinated to local animal treatment. But, in both types of settlements, the acquisition of raw material seemed to be ruled by some social control.

*Jullig, P. (see Storck, P.) [74]*

*Junker, Laura Lee (Vanderbilt University)*

**[36] THE POLITICAL ECONOMY OF A.D. 500-1500 PHILIPPINE CHIEFDOMS**

Ethnohistoric research suggests that the political economy in A.D. 500-1500 lowland Philippine chiefdoms was characterized by a complex array of interlinked exchange systems: foreign luxury good trade with China, regional specialization and inter-island trade in local prestige goods, and the use of status goods to obtain critical raw materials from upland tribal populations. Archaeological evidence from the Tanjay chiefdom of Negros Oriental is used to document the growth and expansion of this chiefly prestige goods economy and the inter-relationships between component exchange systems.

*Kalasz, S. (see Metcalf, M.) [66]*

*Kang, Bong (Oregon)*

**[94] THE IMPACT OF WARFARE IN THE FORMATION OF COMPLEX SOCIETIES IN THE PROTOHISTORIC KOREAN PENINSULA**

Many scholars have formulated different models concerning the formation of complex societies, emphasizing factors such as irrigation, interregional exchange, population growth, warfare, and combinations of these. Archaeologists have begun to understand the underlying conditions and socio-cultural processes that led to formation of complex societies and to realize that different factors were at work in different world regions. Certain sets of factors have been identified in the archaeological record in both Korea and world areas. This paper examines how one of these factors, warfare, contributed to the rise of complex societies in the protohistoric Korean peninsula (A.D. 300-600).

*Kaplan, Flora E. S. (New York University) [Discussant 3]*

*Kardulias, P. Nick (College of Wooster), Richard W. Yerkes (Ohio State), and Heather Gaybeart (Kenyon College)*

**[84] FINDING THE NEOLITHIC "NEEDLE" IN THE CYPRIOT HAYSTACK: SURVEY AND REGIONAL DYNAMICS IN CENTRAL CYPRUS**

The Athienou Archaeological Project conducted its fourth season of work in central Cyprus in 1993. The survey recorded seven additional sites, including a Neolithic chert quarry, the second in the Mallaoura Valley. Analysis of the Acramic Neolithic flaked stone assemblage has identified a number of diagnostic features for this important phase. The additional survey work also confirmed the initial assessment of a highly nucleated settlement pattern in the valley. The regional dynamics in the Mallaoura Valley differ significantly from other areas in Cyprus, probably due to the location intermediate between the mountains to the north and the coast to the south.

*Karimali, Evagelia (Boston University)*

**[50] SPECIALIZATION AND SELF-REPRODUCTION: THE NEOLITHIC MODE OF PRODUCTION RECONSIDERED**

Until now, domestic production and gift exchange have been proposed as the sole possible modes of production and exchange for the early stateless societies of Neolithic Thessaly, Greece. Ethnographic data

from the non-hierarchical societies demonstrate the co-existence of different modes of production and exchange. Although ideally thought as two entirely different types of trade, gift and market exchange, by being complementary and convertible to each other, ensure the process of social reproduction. Behind the operation of trade networks lies a quite stable system of domestic and specialized production units, characterized by different levels of technical competence and efficiency.

*Katzberg, Anne H. (Calgary)*

**[54] STABLE ISOTOPES AND INFANT FEEDING PRACTICES**

Initial research on the use of the stable isotopes of carbon and nitrogen for reconstructing diet focused on adult individuals in prehistoric populations. More recent analysis of preserved protein from individuals of all ages reveals a recurring pattern where  $\delta^{15}\text{N}$  values are consistently higher in infants, then taper off around the first to second year of life. Based on the fact that nitrogen isotopes indicate trophic level, this pattern has been interpreted as evidence for breast-feeding and weaning. The pattern has been observed in several skeletal populations in the Americas, and a recent study of a historic cemetery sample from Ontario suggests the possibility of refining estimates of weaning age.

*Kay, Marvin (Arkansas)*

**[74] DALTON: AN ADAPTIVE RADIATION**

Following Anderson, Dalton appears to represent a middle to late Paleoindian successful colonization of the interior uplands of what is nominally known as the southeastern United States. This paper reviews the Morse Dalton settlement model developed for the lower Mississippi River Valley and assesses Dalton settlement strategies and subsistence for the western Ozark Highland, especially at Rodgers Shelter, Missouri.

*Kealhofer, Lisa (Smithsonian Tropical Research Institute)*

**[25] PHYTOLITHS AND THE PALEOECOLOGY OF CENTRAL THAILAND**

Settlement sequences from central Thailand document 8000 years of environmental change and human impact. Three sequences from the Lopburi region are compared with two from the Bang Pakong Valley, east of Bangkok, to achieve a more in-depth understanding of the changes in regional habitats during the Holocene. Evidence for human impact, including both economic species and carbon, in these sequences appears not long after 8000 B.P., however intensive human disruption begins in the third millennium B.P. These data serve to redefine our understanding of cultural and agricultural developments in central Thailand during the Holocene.

*Kearns, Timothy (Western Cultural Resource Management)*

**[89] IN THE SYSTEM OR OUT: AN EXAMINATION OF SMALL HOUSE MATERIAL CULTURE VARIABILITY AND GREAT HOUSE ASSOCIATION IN THE SOUTHERN CHUSKA VALLEY, NEW MEXICO**

Although many Pueblo II habitation sites in the southern Chuska Valley, northwest New Mexico are spatially associated with a Great House Community, others are spatially isolated. Does this differential association indicate variability in the level of socio-economic organization or participation in socio-political networks, i.e., the Chaco System? Variability in access to non-local material goods is considered one measure of involvement in regional socio-political systems. Data from recent excavations at Pueblo II small house sites in the southern Chuska Valley are used to examine variability in access to non-local goods between Great House community sites and spatially isolated sites. The results are then used to assess the relative degree of involvement in regional socio-political networks.

*Keegan, W. (see Stokes, A.) [54]*

*Keegan, William F. (Florida Museum of Natural History)*

**[79] UNIVERSALS AND REFUTATIONIST LOGIC IN THE WEST INDIAN LABORATORY**

The laboratory approach is based on the premise that a universal set of relations exists among variables such that the outcome of any experiment can be predicted from knowledge of the variable's states. Use of this methodology to study Taino prehistory was recently criticized by a philosopher of archaeology. The present paper defends the use of the laboratory model and reviews insights gained from comparing population distributions across the Antilles. These insights correct recent misconceptions regarding the rate at which the Antilles were first colonized, the relative use of terrestrial and marine foods, and the initial emergence of caciques.

*Keboe, Alice B. (Marquette University) [Discussant 52]*

*Keboe, Alice B. (Marquette University)*

**[34] WHAT WAS A CHILD?**

"Child" is cognate to a Germanic term for "womb." Its primary meaning was "offspring." As Philippe Aries argued in *Centuries of Childhood*, immature persons past weaning have often been seen as small but not incompetent. They have been expected to endeavor to follow the activities of adults. Tailoring artifacts

to their size has not been common, and toys are generally flimsy and perishable. Recognizing "children" from societies that did not conceptualize "childhood" as Western bourgeois culture has constructed it, will require not only meticulous sorting out of features commensurate with small-size persons' activities, but radically confronting our emic concept "children."

*Kelley, Jeffery (Washington State), William Lipe (Washington State), and Mark Varien (Arizona State)*

[37] THIRTEENTH CENTURY CANYON-RIM ARCHITECTURAL COMPLEXES IN THE MESA VERDE REGION

The A.D. 1200s witnessed significant settlement aggregation and change in the central Mesa Verde region of southwestern Colorado and southeastern Utah. One manifestation is the widespread appearance of massive architectural complexes on canyon rims near reliable springs. Dominated by non-domestic features such as enclosing walls, towers, D-shaped buildings, and plazas, these complexes are generally associated with cliff dwellings and/or talus slope structures as parts of larger aggregates. The characteristics, distribution, chronology, and functions of sites with canyon rim architecture are explored, and a large, recently-mapped and dated example—the Woods Canyon Site—is analyzed in more detail.

*Kelly, John (Southern Illinois-Edwardsville)*

[78] POPULATION ESTIMATES AT CAHOKIA AND THE AMERICAN BOTTOM: PROBLEMS AND PROSPECTS

Gregg's 1975 population estimate for the large Mississippian center of Cahokia has perpetuated a demographic demon contributing to a number of misconceptions regarding the overall size and complexity of this settlement. Milner's more recent estimate for the outlying Mississippian settlements is methodologically rigorous, however, tends to omit a number of settlement types and thus oversimplify the density of population surrounding Cahokia. A wealth of new information has been generated at Cahokia and the surrounding region. Utilizing this new data this paper examines these problems and offers a number of solutions to the demographic dilemma that dominates the literature.

*Kelly, Kenneth (California-Los Angeles)*

[73] RECENT EXCAVATIONS AT SAVI, AN 18TH CENTURY WEST AFRICAN TRADE TOWN IN BENIN

This paper discusses recent research conducted at Savi, a trade town located in the Bight of Benin. The town, destroyed by the Fon kingdom of Dahomey, had been important in the slave trade with the New World. Due to its destruction in 1727 and subsequent abandonment, the town site provides an excellent opportunity to investigate material culture in one region of the West African coast during the early period of European contact and trade.

*Kelly, Robert L. (Louisville)* [Discussant 16]

*Kelly, Robert L. (Louisville)*

[90] PREHISTORIC BACKGROUND TO STILLWATER MARSH BIOARCHAEOLOGY PAPERS

This paper presents the prehistory background to the Stillwater Marsh bioarchaeology papers. While providing "the best foraging game in town" the archaeology of the Carson Sink still points to a mobile adaptation. However, pinyon groves of the nearby Stillwater Mts. were used through logistical mobility only. Recently discovered sites in the marsh point to a reduction in residential mobility, perhaps after 1300 B.P. and a shift in settlement patterns after 650 B.P., although differential site exposure could play a role here as well. Ethnographic data point to residentially mobile groups tethered to wetlands; these data also show greater mobility of men than women.

*Kennett, Douglas J. (California-Santa Barbara)*

[92] OXYGEN ISOTOPE ANALYSIS OF ESTUARINE CLAM SHELLS AS A METHOD FOR RECONSTRUCTING PATTERNS OF MOLLUSCAN USE BY PREHISTORIC POPULATIONS LIVING ON THE COAST OF SOUTHWESTERN MEXICO

Stable oxygen isotope ratios in the shell carbonate of marsh clams living in the Acapetahua Estuary of southwestern Mexico record fluctuations in salinity caused by alternating wet and dry seasons. Isotopic composition of marsh clam shells from late Archaic Period (5000-4000 B.P.) archaeological deposits in this region are used to determine the season of clam harvest. In the early stages of the late Archaic Period marsh clams were collected all year but were primarily harvested during the dry season. Procurement patterns changed during the late Archaic Period with a general trend toward clam harvesting during wet season months. People living in this region possibly altered their overall subsistence strategy due to scheduling conflicts that occurred with the adoption of agriculture.

*Kent, Jo (Colorado-Denver), James Kirk (Colorado-Denver), and Kimberly Lovett (Metropolitan State)*

[66] SETTLEMENT PATTERNS IN THE MIDDLE ARCHAIC PERIOD IN THE HOGBACK VALLEY, COLORADO

The Dakota Hogback is located in the foothills of the Rocky Mountains, west of Denver, Colorado. It lies between two known culture areas—the Mountain Tradition to the west and the Plains Cultures to the east. Although there are over 55 recorded archaeological sites and field work has been conducted in the Hogback for many years, a comprehensive field survey and regional synthesis has not been attempted. This paper will present a synthetic view of this area concentrating on the Middle Archaic period. Specifically, this paper will examine the question of cultural affiliation (mountain, foothill, plains) and length of occupation at sites in the area (short term or seasonal).

*Kent, Susan (Old Dominion)*

[81] UNSTABLE HOUSEHOLDS IN A STABLE COMMUNITY: THE ORGANIZATION OF A RECENTLY SEDENTARY SETTLEMENT

Diachronic observations during most of the life of a sedentary Kalahari community occupied by recently nomadic peoples offers insights into the dynamic processes that may have been in operation during the initial shift to sedentism that occurred at different times and different places throughout prehistory. Factors not often considered when modeling prehistoric communities appear to be as important or more important than kinship and economics, such as sharing partners and friendship, in organizing the spatial patterning and interaction of camps and households, in at least this newly sedentary Kalahari community.

*Kepecs, Susan (Wisconsin)*

[29] NORTHEAST YUCATAN AND THE AZTECS: THE MESOAMERICAN WORLD PERSPECTIVE ON THE EVE OF THE SPANISH CONQUEST

The Late Postclassic period marked a new world order in Mesoamerica, characterized by Aztec dominance over much of the macroregion. Yucatán was on the margins of this far-flung system. This is in stark contrast to the Early Postclassic, when northeast Yucatán was under the political and economic influence of Chichén Itzá, a major pole of pan-Mesoamerican commerce. Using various lines of evidence, including regional settlement pattern data and the ethnohistoric record, this paper examines how northeast Yucatán was affected by the changes generated by the Aztec state, and explores the nature of the core-periphery relationship between these two regions.

*Kerley, J. (see Cassell, M.)* [35]

*Keyser, James (USDA Forest Service)*

[103] ROBE ART: THE MISSING LINK IN THE BIOGRAPHIC ART LEXICON

Northwestern Plains Biographic Style Indian art was done in rock art, ledger books, and hide paintings. Rock art and ledger art have been well studied, and a preliminary lexicon to help interpret these drawings has been defined. Robe art, however, is not well known to scholars of Plains Indian art. Recent research shows that Biographic art on a number of these pieces can serve as a missing link to further develop the Biographic art lexicon. The importance of these robe art drawings derives from their early date, coupled with the refinement and flexibility of this medium for illustrating nuances of detail.

*King, Mark B. (Georgia State)*

[55] DIFFERENTIATING IDEOLOGICAL SYMBOLISM FROM HISTORICAL SIGNS IN THE MIXTEC CODICES

The ideological content of Mixtec codices is examined, advocating the complementary analysis of language, symbolism, and ethnography as an effective means to interpret this content. This approach is shown to be effective in the identification of cultural and ideological categories, ranging from the most fundamental principles of Mixtec cultural logic to invariant collections of offerings for specific ritual contexts. Pursuing this methodology will lead to better understanding of ideological structure, and also offers the potential for an analysis of ideological praxis, by comparing how different elite families recorded their genealogical relationships using a common set of ideological concepts.

*King, R. (see McCoy, P.)* [102]

*Kirch, Patrick V. (California-Berkeley)*

[39] OCEANIC ISLANDS: MICROCOSMS OF "GLOBAL CHANGE"

Most natural scientists still work under the assumption that the island ecosystems of the Pacific have seen dramatic human impacts only since the intrusion of Europeans. Yet recent inter-disciplinary research between archaeologists, avian paleontologists, palynologists and others has now demonstrated that massive human-induced changes in insular biota and landscapes commenced with Polynesian colonization 3-2,000 years B.P. This paper explores some implications of these new data for understanding processes of "global change."



**Kirch, Patrick (California-Berkeley)****[6] LAPITA EXCHANGE: THE EVIDENCE FROM LITHIC MATERIALS OTHER THAN OBSIDIAN**

The Lapita cultural complex in the southwestern Pacific (ca. 3600-2000 B.P.) is known to have involved extensive long-distance, inter-island exchange. To date, such Lapita exchange has been reconstructed and modelled largely on the basis of ceramic and obsidian evidence. In this paper, I consider the additional contribution to be made through petrographic analysis of non-obsidian lithic materials, particularly volcanic and meta-volcanic oven stones and manuports, using materials from the Talepakemalai site in the Mussau Islands.

*Kirk, J. (see Kent, J.)* [66]

**Kirkendall, Melissa Ann (Hawai'i-Manoa)****[79] DIFFERENTIAL RESPONSES TO INFECTIOUS DISEASE IN THE PACIFIC AT EUROPEAN CONTACT**

Responses to infectious diseases introduced at European contact varied throughout the Pacific. General issues in disease response include the timing and frequency of European contact, mortality induced from secondary factors, the genetic homogeneity of the indigenous population, and patterns of inter and intra group contact. Tahiti, Fiji, and Island Melanesia display characteristics along a continuum of variation when examined against the backdrop of the issues. Archaeological research exploring demographic and cultural change in the Pacific needs to take into account potential variation in disease response at European contact.

*Klesert, A. (see Benallie, L.)* [93]

**Knecht, Heidi (Miami)****[84] PROJECTILE POINTS OF BONE, ANTLER, AND STONE: EXPERIMENTAL EXPLORATIONS OF MANUFACTURE AND FUNCTION**

This paper explores ways in which the raw material selected for projectile point production influences projectile point design, manufacture, and use. The structural and mechanical properties of bone, antler, and stone are highly differentiated. Results of experimental manufacture and use of projectile points made of these three materials indicate the manner in which variables such as technique of manufacture, hafting technique, morphology, and performance characteristics (e.g., depth of penetration and reaction to impact) are related to the raw material of production.

**Knobloch, Pat (Institute of Andean Studies)****[77] ADAPTING TO THE EMERGING ROLE OF WARI LEADERSHIP**

A 1978 analysis of ceramics from a 3 meter stratified refuse deposit at Wari produced evidence that Middle Horizon 1 Ayacucho populations were interacting with south coast Nasca 8 populations, then central coast Cajamarquilla populations and finally south highland populations. The transition from a long established Huarpa community that began the social ties with south coast Nasca 7 populations to a widespread interaction network indicates the domineering sociopolitical strategy of Wari leadership. This discussion will present recent research into the relationship of non-Wari polities at the end of the Early Intermediate Period as they adapted to the emerging role of Wari leadership.

**Kobl, Philip L. (Wellesley College)****[93] COLONIALISTS WEARING WHITE HATS: INTERNATIONALIST "READINGS OF THE PAST" IN THE FORMER USSR**

Official state-sponsored archaeology in the former Soviet Union can be criticized on many grounds, including its forced adherence to an outmoded 19th century evolutionary orthodoxy that denied or minimized local cultural developments and diversity. While noting examples of this phenomenon, this paper focuses on the more positive aspects of internationalist "readings of the past" which impeded (or at least tempered) the construction of dangerous local national mythologies based upon the manipulation of the archaeological record.

*Kobler, T. (see Gumerman, G.)* [99]

**Kobler, Timothy A. (Washington State and Santa Fe Institute)****[46] PREHISTORIC HUMAN IMPACT ON UPLAND NORTH AMERICAN SOUTHWESTERN ENVIRONMENTS: HISTORY OF RESEARCH, CONSEQUENCES FOR CULTURE CHANGE, AND IMPLICATIONS FOR PREHISTORIC DECISION-MAKING**

In this paper I review the history of research on the question of prehistoric human impact on the environment in the upland Southwestern portions of North America and present knowledge on the nature, severity, and consequences of those impacts. I then discuss how decision-making either by reference to social norms or rational strategizing can lead to unsustainable use of the environment. This will lead to some predictions as to what strategies were in fact used for decision-making at certain points in the

prehistoric Anasazi sequence, as well as a discussion of the general features of strategies that can result in sustainable adaptations, whether in prehistory or today.

*Kolb, Charles C. (National Endowment for the Humanities)* [Respondent to Snow 3]

*Kolb, M. (see Murakami, G.)* [94]

*Kolb, M. (see Sweeney, M.)* [100]

**Kolb, Michael (State Historic Preservation Division, Hawaii) and James Snead (California-Los Angeles)****[81] ISSUES IN COMMUNITY-LEVEL ANALYSIS IN ARCHAEOLOGY**

The traditional dichotomy between the 'site' and the 'region' in archaeological research has limited our understanding of one of the most significant components of society lying between the two; the local community. Long a concern of ethnographers, study of this level of socio-political integration is relevant for a number of issues currently of interest to archaeologists. This paper discusses theoretical issues of community-level analysis in archaeology by first defining some of the methodological concerns at the core of this approach. Current research on community-level cultural landscapes in Hawai'i and New Mexico will provide relevant case studies.

*Kornietz, N. (see Soffer, O.)* [69]

*Koski, S. (see Gifford, J.)* [41]

*Kozarek, S. (see Connolly, R.)* [23]

**Krass, Dorothy Schlotzbauer (Massachusetts)****[52] TRANSMITTERS OF (ARCHAEOLOGICAL) KNOWLEDGE: A STUDY OF TEACHERS**

As anthropologists, we recognize that every region has a unique environment for learning about archaeology. In Massachusetts, curriculum requirements are determined by the school district, not the state; and visible archaeological sites are all from the historic period. Creating useful, attractive materials for teaching archaeology had to start with an evaluation of the knowledge and attitudes of teachers—What do they know about archaeology? Where do they get this knowledge? How accurate and current is it? How do they think archaeology relates to their teaching goals?—and of the institutional and cultural conditions that influence their including archaeology in their teaching.

*Krueger, H. (see Ambrose, S.)* [54]

**Kryder-Reid, Elizabeth (CASVA, National Gallery of Art)****[62] CALIFORNIA MISSIONS: LANDSCAPES OF DISCIPLINE**

The explicit purpose of the 21 California missions was the conversion of California's indigenous peoples to Catholicism, while the implicit purpose was claiming new territory and integrating its inhabitants into the Spanish empire. These missions were part church, school, factory, plantation, prison, hospital, and dormitory—all disciplining institutions. Through daily regimen and a variety of panoptic devices, the missions were landscapes of control. The effectiveness of that control was not uniform, however, and this paper examines the historical, visual, and material evidence of the mission landscapes as a physical framework of relations of power between the Spanish and the Native Americans.

*Kuckelman, K. (see Lightfoot, R.)* [89]

*Kuhn, S. (see Stiner, M.)* [19]

**Kuhn, Steven (Loyola-Chicago)****[20] MIDDLE AND EARLY UPPER PALEOLITHIC TECHNOLOGICAL VARIABILITY AT RIPARO MOCHI (LIGURIA, ITALY)**

This poster presents findings on Mousterian and Aurignacian lithic assemblages from Riparo Mochi, a deeply stratified rockshelter in northwest Italy. The appearance and character of change between Middle and early Upper Paleolithic (Aurignacian) varies with the analytical perspective. Typological indicators could suggest continuity between late Mousterian and earliest Aurignacian, whereas methods of tool blank production and patterns of raw material utilization changed radically across the same interval. These observations have implications for the techno-economic behavior of MP and EUP hominids, as well as for the utility of many "diagnostic" features of Paleolithic industries.

**Kuhn, Steven (Loyola-Chicago) and Mary C. Stiner (Loyola-Chicago)****[2] BEHAVIORAL ECOLOGY OF HUMAN ORIGINS RESEARCH**

Many attempts to apply archaeological findings to debates about the biological origins of modern humans are overtly typological, citing idealized conjectural patterns of hominid behavior as support for competing models. However, it is inappropriate to assume that a single pattern of behavior characterized organisms

as complex as archaic or modern *Homo sapiens*. Moreover, when appropriately framed, archaeological research reveals much variety within the behavioral repertoires of hominids. The main contribution of archaeology to human origins research is a fuller comprehension of the limits and structure of different hominids' responses to environmental, demographic and social factors.

*Kulisheck, Jeremy (Southern Methodist University) and Michael Adler (Southern Methodist University)*

**[58] DIVERSITY AND CONTINUITY IN CLASSIC AND PROTOHISTORIC VILLAGES OF THE TAOS DISTRICT, NORTHERN NEW MEXICO**

The material record of the Taos District, New Mexico, has been generally characterized by a significant degree of continuity from the Coalition to the Classic Period, at a time when major changes are evident throughout the rest of the Rio Grande region. Examination of the materials from Pot Creek Pueblo and Picuris Pueblo indicate that such continuity takes place in the context of the adoption of other material culture traits which emerge throughout the Rio Grande region during the Classic Period. Examination of the site structure at Pot Creek and Picuris also indicates that site component, as well as possibly total site, abandonment, was a common phenomena.

*Kunz, M. (see Reanier, R.) [74]*

*Kus, Susan (Rhodes College)*

**[67] HOUSE TO PALACE, VILLAGE TO STATE: SCALING UP ARCHITECTURE AND IDEOLOGY**

In many societies house form and organization map social and cosmological principles allowing them to be appropriated somatically, emotionally and intellectually by individuals. A state's order that transcends rural routine and space can be articulated with the cosmos by having royal palaces follow rules of rural houses. In this scaling up the state benefits from the logic and metaphor of a world order whose "socialization" is guaranteed a solid base without much state imposition. The complexity of such architectural and ideological scaling up are discussed for 19th century Imerina in Central Madagascar using ethnohistorical, archaeological and ethnographic information.

*Kvamme, Kenneth L. (Boston University)*

**[49] SEEKING PATTERNS IN DATA: ALBERT C. SPAULDING AND STATISTICAL INFERENCE**

Whether or not the quantitative revolution that has transformed some disciplines has come and gone in archaeology and whether it has achieved its proper impact is open to debate. Whatever the case, it is becoming clear that the EDA and pattern seeking approach advocated by Albert Spaulding some four decades ago is finally achieving major attention, but through a different and unexpected source. It is the advanced graphical output and data visualization offered by modern computer software that is realizing Spaulding's original vision. It is through this mechanism that archaeologists are finally getting in tune with their data, an outcome which will hopefully lay a groundwork for richer theory.

*Kwiatkowski, Scott (Archaeological Research Services)*

**[80] CONTINUITY AND CHANGE IN PHOENIX-AREA HOHOKAM SUBSISTENCE FROM THE CIVANO PHASE TO THE POLVORÓN PHASE: THE FLOTATION EVIDENCE**

A relatively large number of flotation samples dating to both the Civano and Polvorón Phases have now been analyzed from several Phoenix-area Hohokam sites. Some authorities, especially Charles H. Miksicek, have suggested that these data indicate that local Hohokam populations may have had declining success with agriculture during the Civano Phase, and that this situation could have led to a greater reliance on wild plants by the Polvorón Phase. This paper reviews the literature on Civano and Polvorón Phase Hohokam subsistence—especially flotation studies from the metropolitan Phoenix area—and evaluates the data for quantitative evidence of subsistence shifts.

*Ladefoged, Tegen N. (Auckland)*

**[100] SOCIOECONOMIC TERRITORIES ON MOTUTAPU, AOTEAROA**

Throughout prehistoric Aotearoa (New Zealand) technological and environmental conditions necessitated annual storage of sweet potato for winter subsistence and planting stock. These food stores, and the land used to produce them, were contested resources. In order to defend subsistence resources, individuals were often organized into kin groups of between 30 to 150 people, the *hapuu*. A landscape perspective is used to interpret the results of a geographic information system analysis of global positioning system and digital theodolite data from the small island of Motutapu. On one level, the replication of social and economic territories defined by the distribution of fortified *pa* suggests competition between *hapuu*. A higher level of political integration is suggested by morphologically distinct *pa* situated in strategic locations.

*Lambert, Patricia (California-Santa Barbara)*

**[47] SETTLING DOWN IN SANTA BARBARA: THE ORIGINS AND CONSEQUENCES OF SEDENTARY VILLAGE LIFE IN SOUTH COASTAL CALIFORNIA**

Cemetery data are used to identify and interpret changes in the settlement systems of prehistoric hunter-gatherers of the Santa Barbara Channel area. Throughout the long prehistoric sequence, burial was the

primary means for disposing of the dead. Because the dead were buried in close proximity to habitation sites, variables such as the appearance, size, and distribution of cemeteries provide important clues about temporal and spatial variations in the duration and intensity of village occupations. Skeletal remains from these cemeteries provide a record of health and disease that is also useful in tracking increasing sedentism. The causes and consequences of sedentism for these complex hunter-gatherers are discussed in the context of the region's unique prehistory.

*Lamotte, Agnes (Lille)*

**[20] MIDDLE PLEISTOCENE BIFACE INDUSTRIES FROM NORTHERN EUROPE: THE BEHAVIORAL SIGNIFICANCE OF SOME SPECIALIZED ASSEMBLAGES**

Several variations are evident in the lithic assemblages of six northern European sites (11 levels) with similar geographic and paleoenvironmental contexts. Generally speaking, cleavers, choppers, chopping-tools, bolas and polyhedrals are not present. Rather, these assemblages vary along three axes: many or few bifaces (with an evolution in morphology), many or few flake tools (with variability in the use of interior and exterior flake surfaces), and the presence or absence of the Levallois technique. These three elements form assemblage variability in northern Europe, which parallels the situation in Africa and the Near East during the same period.

*Lanata, Jose (Texas-Austin) and C. Britt Bousman (Texas-Austin)*

**[97] RISK AND ADAPTATIVE STRATEGIES IN PALEOINDIAN OCCUPATIONS AT CENTRAL TEXAS**

In this paper we provide data from the Wilson-Leonard site that presents evidence for different exploitation patterns among Paleoindians. Small and unpredictable, yet significant fluctuations in local environments and climate could have played an important role in the employment of different adaptive strategies among Paleoindian inhabitants of Central Texas. During periods of environmental change, human populations could have altered their strategies to cope with food scarcity, including not only the exploitation of large mammals but small animals and plant foods as well. The characterization of Paleoindian adaptive strategies as concentrating on megafauna appears to be flawed.

*Lange, Frederick William (Colorado) [Discussant 32]*

*Lange, Richard C. (Arizona State Museum)*

**[50] AS FAR AS THE EYE CAN SEE: SOME BASIC TESTS OF PREHISTORIC SIGNALLING CAPABILITY**

Prehistoric architecture, such as towers, and site locations on high places lead many to speculate about communication or signalling. Researchers often draw lines of sight on maps to indicate potential communications, regardless of message being communicated, manner of transmission, or distances involved. Some data, testing signalling abilities, have been collected but are not widely available or known. A number of field tests were conducted to test certain aspects of signalling, including different means and messages, and over various distances. Certain techniques permit signalling over long distances, but the messages are limited.

*Larick, Roy R. (Bement School)*

**[33] CHILDREN LEARNING PREHISTORY IN CONTEMPORARY FRANCE**

By American standards, prehistory bombards French children. The quantity and quality of learning avenues reflect French patrimonial ideology but are increasingly fueled by profit. Five avenues for learning Palaeolithic prehistory illustrate the case: numerous public sites with guided visits; traditional school curricula in prehistory; a growing number of small-scale private theme parks; a wildly proliferating popular literature; and action-oriented learning modules developed by professional archaeologists. The paper evaluates these avenues on modes of presenting (questioning-answering) and learning (active-passive), and on explanatory attitude (open-closed). It speculates future developments in commercialism and international applications.

*Larralde, Signa (Museum of New Mexico) and Sarah H. Schlangner (Museum of New Mexico)*

**[33] ANASAZI AXES FROM THE LA PLATA VALLEY: MANUFACTURE, USE, AND DISCARD**

Excavations of parts of two Anasazi communities during the La Plata Highway Project yielded a large sample of Anasazi axes and other large hafted tools. Several types of axes were found in various stages of manufacture, making it possible to reconstruct a variety of manufacturing trajectories. Axe and maul distribution suggests patterns of tool use and curation, as well as patterns of residential abandonment of the Anasazi communities at Jackson Lake and Barker Arroyo. These patterns are contrasted with large hafted tool distribution at other Four Corners Anasazi communities.

*Larsen, Clark (North Carolina-Chapel Hill) and Dale Hutchinson (East Carolina University)*

**[90] OSTEOPATHOLOGY OF HUNTER-GATHERERS FROM THE CARSON DESERT: RECONSTRUCTING PREHISTORIC LIFEWAYS IN THE WESTERN GREAT BASIN**

Study of human skeletal remains from the Stillwater Marsh region of western Nevada has revealed details of adaptation. This paper reports on a range of paleopathological indicators, indicating that populations



were generally healthy, with relatively little evidence of physiological stress or experience with infectious pathogens. High prevalence of osteoarthritis argues for a nonsedentary, physically demanding lifestyle.

*Larson, L. (see Phillips, L.)* [18]

*Larson, Lynn L. (Larson Anthropological/Archaeological Services)*

[18] RESULTS OF THE WEST POINT PROJECT EVALUATED IN REGIONAL AND ETHNOGRAPHIC CONTEXTS

The West Point artifact assemblage and data analysis provide a data base for 4,500 years of land use for a landform in Puget Sound. Comparison with sites on the Duwamish River, Chester Morse Lake, the San Juan Islands, and the Gulf of Georgia may provide answers to important regional questions such as: When and why did the shift from forager to collector organization occur in Puget Sound or throughout the Northwest? How did earthquakes affect settlement pattern through time in the Duwamish River Valley? Did Duwamish villages participate in an interdependent economy based on ecological strengths?

*Larson, Mary Lou (Wyoming)*

[66] ROCKY MOUNTAIN HOUSEPITS: THE EDSELS OF THE INTERAMERICAN WEST?

Semi-subterranean features known as housepits in the Rocky Mountains and Northwestern High Plains served as dwellings throughout much of the area's prehistory, with a florescence during the Early Plains Archaic. If one subscribes to Gilman's criteria for the use of such dwellings, housepits should have been ideal dwellings for hunter-gatherers in the area. However, other architectural types, such as tipis and wickiups, surpassed housepits in importance. Investigation of the characteristics of Rocky Mountain housepits and their theoretical underpinnings provide insight into these enigmatic features.

*Laub, Richard (Buffalo Museum of Science)*

[74] THE PALEOINDIAN RECORD AT THE HISCOCK SITE (WESTERN NEW YORK): ITS NATURE AND CONTEXT

Spring-derived terminal Pleistocene sediments at the Hiscock Site contain disarticulated, mixed bones of American mastodon (MNI=8) and other megafauna species, as well as abundant conifer twigs and cones that were probably fecally deposited. These sediments have also yielded lithic artifacts (mostly fluted bifaces), and several bones that may have been culturally modified. Two well-like excavations could be products of proboscidean and/or human activity. The site is interpreted to have contained several spring-fed pools in a corridor between two large lakes that extended more than 50 miles in an east-west direction.

*Lawlor, Eltzabeth J. (California-Riverside)*

[25] SITE-FORMATION PROCESSES AFFECTING PHYTOLITH DEPOSITS IN THE MOJAVE DESERT

In theory, phytoliths are deposited through decay of plant material and remain in place (i.e., within about 30 m.) until recovery by the archaeologist. Does this decay-in-place model apply in the Mojave Desert or adjacent Great Basin? If so, then we can use phytoliths there to identify prehistoric plant-processing features. The answer depends on a reference collection focused on (1) cultural practices of gathering, processing, and discarding certain plant parts, and (2) phytolith assemblages from soils representing modern vegetation associations. I report an experimental field study comparing soil samples from modern food preparation areas to samples from control areas.

*Lazrus, Paula Kay (New School for Social Research)*

[91] FARMERS, PASTORALISTS & ENVIRONMENTAL DEGRADATION IN SARDINIA

Data from a recent field survey in two regions of Sardinia suggests that specialized pastoralism on the island is a fairly recent phenomenon. Research on land-use and settlement patterns from prehistory through the present time, indicate that major environmental changes probably did not occur until the late Middle Ages or later. The most significant transformation of the environment is an even later phenomenon beginning in the 1800s due to external political and economic influences imposed on the island's inhabitants leading to the shift from agriculture to pastoralism and environmental degradation.

*Leach, J. (see Mauldin, R.)* [33]

*Lebo, Cathy (Indiana)*

[104] THE MYTH OF MARGINALITY: FEAST OR FAMINE IN THE AMERICAN SOUTHWEST?

The traditional view that the Southwest is marginal for corn agriculture, therefore all corn farmers lived under greater environmental influence, needs to be reassessed. Direct archaeological evidence from recent skeletal studies indicates reliance on corn as the overwhelming component of prehistoric meals. Ethnohistoric farming practices maintained a fairly dependable food supply in spite of recurrent crop shortfalls. A simulation of corn harvests under reconstructed paleoclimatic conditions is used to reexamine the marginality of prehistoric life in the presence and absence of such an adaptive farming strategy.

*Lebow, C. (see Schalk, R.)* [83]

*Lee, M. (see Stebbens, D.)* [70]

*LeFeure, C. (see Corbett, D.)* [79]

*Lekson, Stephen (Crow Canyon Archaeological Center)*

[99] COMPLEXITY AT CHACO AND CAHOKIA

Archaeological complexity—a social condition—and SFT's complexity—a measurement of structure—most obviously intersect at points when relatively simple, homogeneous archaeological patterns are transformed into highly structured, heterogeneous patterns. In the later prehistory of America north of Mexico, two examples of complexity or complex transformations are central: Chaco and Cahokia. The strikingly parallel structures of these transformations are used to evaluate the utility of both archaeological and SFT's complexity in understanding the past on a continental scale.

*Lensink, Stephen C. (Iowa) and Fred A. Finney (Iowa)*

[105] DEALING WITH RISK IN THE INITIAL MIDDLE MISSOURI VARIANT: LOCAL SUBSISTENCE SYSTEMS AND REGIONAL INTERACTION NETWORKS

People of the Initial Middle Missouri variant in Iowa, known as Mill Creek, appear to have engaged in four strategies by which village agriculturists cope with risk—diversification, exchange, mobility, and storage. Previously collected subsistence data from Mill Creek is re-evaluated to suggest a more complicated system of resource diversification than originally proposed by the climatic hypothesis. New perspectives on Mill Creek field systems, storage capacity, remote hunting camps, and regional interaction with sites in the Mississippi valley are presented. These data argue for a greater range in the means of dealing with fluctuations in food supplies than previously known.

*Lentz, D. (see Pope, K.)* [76]

*Leonard, Banks L. (California-Los Angeles) and Glenn S. Russell (California-Los Angeles)*

[77] COALESCENCE AND TRANSFORMATION IN THE EARLY INTERMEDIATE PERIOD: FROM HORIZON TO HORIZON IN THE CHICAMA VALLEY, PERU.

Recent settlement pattern studies in the lower Chicama allow examination of sociopolitical transformations during the EIP. After Early Horizon numerous small sites became nucleated into fortified hill towns, suggesting intravalley competition among small polities. By Late Gallinazo defensive sites were abandoned and major monumental centers were built, reflecting political unification of the valley. Middle Horizon saw further transformation, including the abandonment of Moche centers, construction of a new center, change in burial practices, ceramic diversification, and strong influences from Cajamarca and Lambayeque.

*Leone, Mark P. (Maryland-College Park)* [Discussant 62]

*LeTourneau, Philippe (New Mexico)*

[37] RECENT INVESTIGATIONS AT THE ANTELOPE WELLS OBSIDIAN SOURCE, ANIMAS MOUNTAINS, NEW MEXICO

Antelope Wells obsidian from the Animas Mountains of southern New Mexico saw heavy prehistoric use. While the location of the primary source area for this volcanic glass is generally known, knowledge of the source material's geologic, physical, and chemical characteristics is limited. This report summarizes recent field work that contributes new information regarding geologic occurrence, surface density, chemical composition, and physical characteristics of the obsidian.

*Letts, K. (see Moe, J.)* [52]

*Leventhal, Richard (California-Los Angeles) and Wendy Ashmore (Pennsylvania)*

[60] FROM EDGE TO CENTER: TERMINAL CLASSIC XUNANTUNICH, BELIZE

Originally a secondary component in the Naranjo polity, the ancient Maya center of Xunantunich emerged as the dominant political force its part of the upper Belize river valley in the Terminal Classic (A.D. 850-1000). In its third field season (1994), the Xunantunich Archaeological Project (XAP) continues inquiry into the causes and implications of the rise and decline of this abruptly assertive late center. As part of the inquiry, XAP is also testing hypotheses about the impact of the governance shifts on the surrounding populace, an impact current models of Maya society suggest were minimal.

*Levi, Laura (Arizona)*

[60] CENTER AND COMMUNITY AT SAN ESTEVAN, BELIZE

At the site of San Estevan, a typology of structure groupings facilitates investigation of the differential distribution of residential arrangements within a prehispanic Maya community. The study finds activities housed in monumental precincts to be directly implicated in the settlement's residential organization. Diffuse political authority, weak political economies, and kingroup self-sufficiency are frequently invoked to account for the dispersment of residence around Maya centers of monumental architecture. Research at San Estevan

suggests, to the contrary, that these settlement systems achieved their form in response to stringent political and economic entailments of community life.

*Levine, Frances (Santa Fe Community College)*

**[58] REEXAMINING THE BASIS OF ETHNOGRAPHIC ANALOGY: AN EXAMPLE FROM PECOS PUEBLO, NEW MEXICO**

Pecos Pueblo was the principle community on the Upper Pecos River in New Mexico from A.D. 1450 until the 1790s when Hispanic settlers entered the valley. In 1838, a much reduced Puebloan community emigrated to Jemez Pueblo. Archaeologists have referred to Pecos in modeling general theories of site abandonment and regional integration. Primary demographic records from Pecos Pueblo and the surrounding Hispanic communities are analyzed for the period 1696-1840. They suggest multiple factors contributed to population decline at Pecos Pueblo. Baptismal, burial and marriage records reflect the contributions of disease, exogamy, warfare and resource competition in the decline of the Pueblo population.

*Levine, Mary Ann (Massachusetts-Amherst) and Barrett P. Brenton (Massachusetts-Amherst)*

**[34] THE PRESENTATION OF PALEOINDIANS IN JUVENILE LITERATURE**

Although Paleoindians have figured prominently in juvenile literature, this medium has received insufficient attention by archaeologists. This paper discusses images and texts portraying Paleoindians in fiction and non-fiction intended for children. We explore the repetition of some themes and the emergence of new themes throughout the history of juvenile literature about Paleoindians. In addition, we call attention to the role of children in these presentations of the past. An examination of such accounts illuminates the information available to children on these initial settlers. Reading these stories also forces us as archaeologists to reexamine our own stories about the past.

*Levy, Janet E. (North Carolina-Charlotte)* [Forum Participant 13]

*Lewarch, D. (see Bangs, E.)* [18]

*Lewarch, Dennis E. (Larson Anthropological/Archaeological Services)*

**[18] THE WEST POINT CHRONOLOGY: A 4,500 YEAR LAND USE SEQUENCE**

Over 60 radiometric dates calibrate a long hunter-gatherer land use sequence at West Point, with initial use episodes beginning ca. 4500 B.P. near the base of a bluff landform and continuing up the slopes and top of a higher elevation beach berm through ca. 200 B.P. Five temporal components are defined for West Point occupations using dendrocorrected age ranges of radiocarbon dates, stratigraphic superposition relationships, and horizontal distribution of cultural deposits across changing landform surfaces. Shifts in activity area locations through time are reviewed to document impacts on landslides, changing sea level, and earthquake-induced ground subsidence.

*Light, P. (see Prentiss, W.)* [105]

*Lightfoot, Kent G. (California-Berkeley)*

**[11] THE SOCIOPOLITICAL ORGANIZATION OF HUNTER-GATHERERS IN CALIFORNIA: ISSUES OF CONCERN**

Two issues are introduced in a symposium on the sociopolitical organization of California hunter-gatherers. The first concerns native responses to early European explorations, epidemics, and the later recruitment of laborers into Spanish missions and a Russian fur trade outpost. How did these encounters influence the spatial distribution, hierarchical elaboration and population size of native polities? The second issue concerns the common use of ethnographic models in California archaeology. How relevant is A.L. Kroeber's longstanding triblet model for understanding the organization of prehistoric native Californian polities?

*Lightfoot, Ricky (Crow Canyon Archaeological Center) and Kristin A. Kuckelman (Crow Canyon Archaeological Center)*

**[89] WARFARE AND THE PUEBLO ABANDONMENT OF THE MESA VERDE REGION**

Throughout the past century archaeologists have debated the role of warfare in the thirteenth century Puebloan abandonment of the northern American Southwest. The authors of this paper summarize regional evidence of violence and its influence on settlement location, community organization, and regional abandonment. A recent locality-based study in the Mesa Verde region addresses these issues using oral history, rock art, and excavation data from two villages. The results of this study support the argument that violence contributed to the formation and final abandonment of thirteenth century Pueblo villages in the northern Southwest.

*Lillis, Katina T. (Ripon College) and Howard A. Snyder (Yale)*

**[91] RESOURCE SELECTION AND GROUNDSTONE ARTIFACTS OF THE PORTUGUESE COPPER AGE: A CONTEXTUAL APPROACH TO PREHISTORIC TECHNOLOGY**

A mineralogical and source assessment of groundstone artifacts from lowland Portuguese Copper Age sites provides evidence for selective and variable use of resources between burials and settlements and the

possible criteria for which various artifacts and the materials used to make them were valued. Most groundstone tools found in settlements are amphibolite, a metamorphic rock whose nearest sources are 100-500 km from lowland sites, but whose density, hardness, and foliation ideally suit it for manufacture and use as hammers, chisels, axes, etc. In contrast, groundstone artifacts from burials are made principally from local igneous and sedimentary rocks and are non-functional, unused replicas of the amphibolite tools.

*Lincoln, Thomas (Bureau of Reclamation), Teresa L. Hoffman (Bureau of Reclamation), Ronald Dorn (Arizona State), and Glen Rice (Arizona State)*

**[50] THE AGE OF A MESOAMERICAN STYLE PETROGLYPH IN SOUTHERN ARIZONA**

Cation-ratio dating of rock varnish is used to arrive at a minimum estimate for the age of a Mesoamerican style petroglyph near Phoenix, Arizona. The glyph was executed using the pecking techniques standard for Hohokam rock art, but the layout, dense packing of lines, and apparent subject matter are not characteristic of this area. The design may show the side-profile of a face with a speech bubble, pointed hat/helmet, cross-sectioned conch, and a shell necklace. This glyph is discussed in the context of other pictorial representations in the Southwest that reflect Mesoamerican influences but were executed within the local forms of material culture.

*Lindauer, Owen (Arizona State)*

**[26] SMALL SCALE INTEGRATION AND DIFFERENTIATION AT THE BASS POINT PLATFORM MOUND**

The platform mound at Bass Point combined the functions of a residence, a storehouse, and a meetinghouse. Social differentiation is suggested by the placement of cremations and inhumations as well as the position of rooms on and around the platform. Analyses of the magnitude of storage, the amount of trash, and effort in platform construction are used to estimate a small scale of integrative activity. There is evidence that relatively few non-residents were required in the construction and maintenance of the platform. These data suggest that platform mounds may appear in a context of small populations having subtle levels of differentiation.

*Lindeman, M. (see Guderjan, T.)* [60]

*Lindly, John (Arizona State)*

**[20] A TECHNOLOGICAL STUDY OF LEVANTINE MOUSTERIAN ASSEMBLAGES**

Middle Paleolithic lithic assemblages from the Levant are studied to gain insights into the technological organization that occurred during this period. Currently favored technological typologies are scrutinized along with views of how and why change occurred through time. The goal of this study is to begin to characterize the range of adaptive choices that occurred from the point of view of lithic technology. This information is then utilized to comment upon the ongoing debate about the origins of modern humans.

*Lipe, W. (see Kelley, J.)* [37]

*Lipe, William D. (Washington State and Crow Canyon Archaeological Center)* [Discussant 3]

*Lipe, William D. (Washington State and Crow Canyon Archaeological Center)*

**[85] MATERIAL EXPRESSION OF SOCIAL POWER IN THE NORTHERN SAN JUAN, A.D. 1150-1300**

The Puebloan occupation of the northern San Juan region of SW Colorado and SE Utah in A.D. 1150-1300 is characterized by a peak in regional population size, locally high population densities, increasing aggregation, new forms of civic architecture, and rapid regional abandonment at the end of the period. A review of architectural, artifactual, mortuary, and settlement data indicates that the material expression of power differentials was continuously variable and subtle, rather than strongly patterned and ostentatious. The context includes both warfare and changes in subsistence risk; relationships of these variables to changes in sociopolitical organization are discussed.

*Liss, K. (see Reese-Taylor, K.)* [44]

*Loendorf, Larry (Arizona)*

**[103] SHIELD-BEARING WARRIOR PICTOGRAPHS FROM MONTANA TO COLORADO**

Shield anthropomorphs are found throughout the Rocky Mountain states. Numerical age estimates (<sup>14</sup>C and Cation Ratio dates) indicate the figures were made as early as A.D. 1100 in central Montana, A.D. 1200 in central Wyoming and A.D. 1500 to A.D. 1600 in southeastern Colorado. The dates for these figures could represent Athapascan movements south or they could be the product of another group, perhaps the Kiowa.

*Lobse, J. (see Hudler, D.)* [87]

*Longacre, William (Arizona) and Mark Neupert (Arizona)*

**[71] IS THE CUSTOMER ALWAYS RIGHT? ETHNOARCHAEOLOGICAL STUDIES OF CERAMIC PERFORMANCE CHARACTERISTICS IN NEGROS, THE PHILIPPINES**

Ethnoarchaeological field work over the past two summers has focused upon the accuracy of customer's appraisals of the performance characteristics of pots produced in two localities on the island of Negros in



the Philippines. Overwhelming preference for pots produced in one locality led to an exploration of the production technology in the two sites and to physical/chemical compositional studies of the clays and tempers used. Production of pots in the two sites is virtually identical, but there are substantial differences in the clays. We focus upon the behavioral relevance of such laboratory measurements. Is the customer always right? Sometimes!

*Lopez Varela, Sandra (CONACYT/SEP)*

[29] THE LATE AND TERMINAL CLASSIC AT YAXCHILÁN AND POMONÁ: A MACROREGIONAL PERSPECTIVE ON CERAMICS AND SOCIAL REORGANIZATION

Following the decline of Teotihuacan, ceramic production in the Maya northwestern zone of Yaxchilán and Pomoná includes stylistic traditions that were introduced by groups affiliated with the Teotihuacan past. These trends apparently reached the northwestern zone via the Gulf Coast, reflecting a Late/Terminal Classic period shift away from the earlier highlands-based network of pan-Mesoamerican interactions. Additionally, the "Teotihuacan revival" in the northwestern zone marks this region as an important periphery through which new products and ideology were transmitted to the rest of the Maya lowlands.

*Lorenzen, Karl (California-Riverside)*

[5] LATE POSTCLASSIC REUSE OF CLASSIC MONUMENTAL ARCHITECTURE AT NARANJAL, QUINTANA ROO, MEXICO

Preliminary analysis of monumental architecture at Naranjal reveals that Classic structures were modified and reused during the Late Postclassic period. Citing comparable architectural features from Mayapan, Tulum, and other Late Postclassic sites, this study describes the characteristics that define and differentiate the Late Postclassic occupation at Naranjal. Documentation of Late Postclassic reuse of structures at Coba, Dzibilchaltun, and other sites of the northern lowlands will be used to interpret the late reuse and modifications at Naranjal.

*Love, M. (see Fredrickson, D.) [11]*

*Loveland, Carol (Utah State)*

[90] A BIOLOGICAL PERSPECTIVE ON PREHISTORIC HUMAN ADAPTATION IN THE GREAT SALT LAKE WETLANDS

Eighty-six skeletons recovered after the retreat of floodwaters along the eastern shore of the Great Salt Lake provide valuable information about environmental stresses and disease episodes faced by the prehistoric inhabitants of the region. Dental wear and degenerative joint disease are the two most pervasive conditions noted in the population. Enamel hypoplasia and transverse lines occur on several skeletons suggesting that the population was under some dietary or disease stress. Skull radiographs reveal altered development of the mastoid in many individuals, reflective of frequent, virulent respiratory infections. Unusual anomalous conditions noted in this skeletal population are discussed.

*Lovett, K. (see Kent, J.) [66]*

*Lowell, Julia C. (Northern Iowa)*

[37] THE HEARTH AS ARTIFACT IN PREHISTORIC PUEBLOS

This session presents a statistical analysis of over 400 fire features from three prehistoric pueblo sites located in the Grasshopper region of Arizona. Six fire feature types are defined and illustrated that vary in form, size, provenience, and associated artifacts. These include rectangular slab-lined, circular unlined, circular clay-lined, roasting pit, oven, and ceremonial types. Shifting patterns in fire feature types and proveniences through the thirteenth and fourteenth centuries A.D. may reflect critical changes in subsistence, seasonality, food preparation techniques, ethnicity, or household and community organization. For comparison, fire features from the historic Pueblo are also illustrated.

*Lucero, Lisa (California-Los Angeles)*

[12] CERAMIC FUNCTION, TECHNOLOGY, AND LABOR INVESTMENT: FACTORS REFLECTING SOCIAL AND POLITICAL CONDITIONS.

This paper addresses how ceramic function, technology, and labor investment reflect social and political conditions in Late Classic Maya society. Current evidence indicates household level ceramic production. Although household level production suggests an open system, the distribution of certain vessels would indicate a more controlled system. Since it was not likely feasible for direct control of distribution, more indirect means of controls had to have been used. Such indirect means could have included ideological sanctions, a theme common throughout Mesoamerica. The extent of ideological control reflects social and political conditions.

*Luedtke, Barbara E. (Massachusetts-Boston)*

[92] GEOLOGY AND ARCHAEOLOGY IN BOSTON HARBOR

Recent research on the geological evolution of Boston Harbor allows new insights into the history of human uses of the area. The distributions of early Holocene river beds and the process of marine inundation

are crucial to the interpretation of Archaic period activities. Later geological processes such as the growth of sand spits appear to have affected resource distributions as well as access to the islands in the harbor by Woodland Period people. The integration of new geological data with archaeological data increases the precision of our interpretations of changing settlement patterns and land use in the Boston Harbor area.

*Lycett, Mark T. (New Mexico)*

[89] STRUCTURE AND CONTENT IN PREVIOUS RESEARCH: NELS NELSON'S EXCAVATIONS IN THE GALISTEO BASIN

Between 1912 and 1914, N.C. Nelson conducted extensive excavations at seven large, late prehistoric or contact period habitation sites in the Galisteo Basin, Santa Fe County, New Mexico. Nelson recorded details of architecture and artifact recovery for each excavated room. Using Nelson's notes and collections, this study investigates formal variation in architecture both within and between sites, as well as variation in artifact deposition by location, volume, and content. These data make it possible to study site structural variation at the level of a settlement cluster and to evaluate that variation in relation to other changes in archaeological patterning coincident with European contact.

*Lyman, R. Lee (Missouri-Columbia)*

[18] THE WEST POINT TERRESTRIAL AND MARINE MAMMAL FAUNAL ASSEMBLAGE: PATTERNS AND COMPARISONS WITH OTHER PUGET SOUND ARCHAEOFAUNAS

The vertebrate faunal assemblage from the West Point site complex is one of the oldest reported from a salt-water coastal context in Washington State. While interpretations of richness or diversity are limited by correlations with sample size, tentative patterns can be proposed. Seasonality data indicate spring through fall use episodes with some differences by temporal component. Subtle spatial differences in processing activities are suggested by degree of bone fragmentation. Comparison of the West Point assemblage to other Puget Sound archaeofaunas suggests that local site habitat characteristics are important factors that condition faunal assemblage composition.

*Lynott, M. (see Goodman, D.) [63]*

*Lynott, Mark (National Park Service) and Alison Wylie (Western Ontario)*

[38] STEWARDSHIP: THE CENTRAL PRINCIPLE OF ARCHAEOLOGICAL ETHICS

The Ethics in Archaeology Committee was formed to address issues about the use of looted data in research and publication. The Committee's proposal to hold a workshop to discuss ethical issues was funded by the National Science Foundation and the National Park Service. In November, 1993 eighteen people participated in a workshop at the University of Nevada-Reno. Three days of intensive discussions resulted in the development of six principles of archaeological ethics. The role of archaeologists as stewards of archaeological record is foundation upon which these principles are based. The principle of stewardship is presented.

*Lyns, Patrick D. (Arizona State Museum)*

[89] DESCRIBING AND EXPLAINING LITHIC VARIABILITY AT PREHISTORIC PUEBLOAN SITES

Analyses of lithic assemblages from prehistoric puebloan sites in the American Southwest have been problematic due to an incomplete understanding of site and assemblage formation processes and difficulty in dealing with "amorphous" or "expedient" lithic technologies. This paper illustrates examples of such problems and presents a number of attempts at solving them. Central to the paper is an examination of the traditional formal/expedient dichotomy and the application of debitage typologies to the description and explanation of intrasite lithic assemblage variability.

*MacDonald, Catherine (Father Leo J. Austin Catholic Secondary School)*

[52] PROGRAM EVALUATION AT THE SECONDARY SCHOOL LEVEL

How do you get school systems and teachers to buy into your education program? Effective program evaluation not only convinces schools that educational archaeology is worth spending tax dollars on but also helps you to develop programs which serve the educational needs of your student clientele. Program evaluation shows that the amount of valuable classroom time spent using archaeology as a method of approaching history or any other subject increases cognitive thinking skills, encourages students to see the past in a new way, provides tremendous opportunity for interdisciplinary learning and assists students to become effective evaluators of their own learning.

*Mack, Joanne (Pomona College)*

[61] PREHISTORIC UPLAND SITES WITHIN THE UPPER KLAMATH RIVER DRAINAGE, SOUTHERN OREGON AND NORTHERN CALIFORNIA: VARIATION IN FUNCTION, SIZE, AND TOOL STONE SOURCES

Systematic surface collection and test excavation of prehistoric sites and a botanical inventory and evaluation of food plants in site locales within the Southern Cascades of Oregon and northern California

allows testing of an hypothesis proposing upland sites as small, specialized sites, used seasonally by the inhabitants of large campsites and village sites located on the terraces of the Upper Klamath River. Analysis and interpretation of materials recovered during two recent field seasons indicate the character of upland sites varies and includes large campsites with tool kits indicating their inhabitants exploited both animal and plant resources over approximately 8000 years.

*MacKinnon, J. Jefferson (Collin County Community College)*

[76] RISE OF SEA LEVEL AND ACCOMPANYING MANGROVE ENCROACHMENT AS A POSSIBLE CAUSE FOR THE CESSATION OF ANCIENT MAYA SALT PRODUCTION ON BELIZEAN COASTAL LAGOONS

Ancient Maya salt production by the *sal cocida* method on Belizean coastal lagoons seems largely confined in time to the Late/Terminal Classic, while it has continued down to the present in other areas. Explanations that coastal salt production in Belize ceased as a result of the Classic Maya "collapse" and/or due to the expansion of long-distance salt trade based in northern Yucatan are explored and a new possibility advanced that it resulted from sea level rise accompanied by mangrove encroachment.

*MacNeish, R. (see Taylor, R.)* [97]

*Maguina, A. (see Shimada, I.)* [15]

*Mabaney, W. (see Storck, P.)* [74]

*Mainfort, R. (see Cogswell, J.)* [78]

*Makowski, Krzysztof (Pontificia Universidad Católica del Perú)*

[77] THE BEGINNING OF THE EARLY INTERMEDIATE PERIOD IN THE CENTRAL COAST OF PERU

The results of the works effectuated in the last five years at Chanccay Chillón, Rimac and Lurin Valleys (the author's ones included) serve as a starting point to make a multidimensional re-evaluation of the cultural situation at the Central Coast, nearly between 200 B.C. and 300 A.D. The gathered evidences fall in contradiction with the image of extreme political fragmentation and total absence of frontiers frequently attributed to this epoch (Early Intermediate Period 1-4).

*Mallinowski, Lynn M. (Argonne National Laboratory) and Shawn D. Haley (Red Deer College)*

[72] NEW EVIDENCE FOR GREAT BASIN PREHISTORIC CONNECTIONS TO THE EARLY ARCHAIC IN THE WASATCH MOUNTAINS OF CENTRAL UTAH

The second season of fieldwork in the Wasatch Mountains has contributed significantly to the knowledge of prehistoric populations in the alpine valleys of central Utah. Continued work in this high altitude region has revealed distinct prehistoric settlement patterns. Early Archaic sites are found in certain east-west trending, high altitude finger valleys, while Formative and Protohistoric sites tend to be found in lower elevation north-south trending valleys. In addition, the Archaic sites yielded a larger number of obsidian artifacts than expected. The obsidian source analysis performed on these artifacts suggests a strong connection to the Great Basin.

*Mandryk, Carole (Harvard University)*

[50] HUNTER-GATHERER SOCIAL COSTS AND THE NONVIABILITY OF SUBMARGINAL ENVIRONMENTS

A review of general principles of hunter-gatherer adaptations and their applicability in Arctic and desert ecosystems provides a basis for modeling behavior in submarginal environments. The low primary productivity of extremely depauperate environments results in high mobility requirements and low population density; i.e., dispersion of the population past the point at which social relations maintaining essential mating and information networks can be maintained. It is determined that submarginal environments are nonviable because it is impossible to meet both economic and social needs within the constraints imposed by extremely impoverished ecosystems.

*Mann, D. (see Reanier, R.)* [74]

*Manson, Joni and David Snyder (Ohio Historic Preservation Office)*

[102] USING TURN-OF-THE-CENTURY WHITEWARES AS ECONOMIC INDICATORS

Late nineteenth/early twentieth century sites, common features of the American landscape, frequently yield large assemblages of whiteware sherds. Unfortunately, most laboratory analyses of historic whitewares do not consider the sherds in their historical context—as the physical remains of consumption patterns determined by the socioeconomic status of the consumers. In this study, old merchandising catalogs and newspaper advertisements (1890-1929) were used to obtain price lists correlated with ware types, to create a ranking index by which comparative analyses of historic whitewares can provide data on the socioeconomic status of the turn-of-the-century consumer.

*Marrinan, Rochelle A. (Florida State)*

[101] MISSION PATALE: THE ARCHAEOLOGY OF AN OUTLYING APALACHEE MISSION

Franciscan evangelization of Apalachee Province in northwest Florida began in 1633 and ended with the destructive raids of English colonists and their Creek allies between 1702 and 1704. Mission Patale represents the early phase of Franciscan evangelization. The mission is believed to have endured at the location under investigation for fewer than twenty years (1633-?1650). During its existence, it was home to five to six hundred Apalachees and a single friar. Mission Patale informs us about the early mission setting and provides data against which the courses of culture change can be measured.

*Martine, D. Kristen (New Mexico)*

[89] VARIATION IN SMALL SITE CERAMIC TECHNOLOGY DURING THE HISTORIC PERIOD (1540-MID-1800S) AT ZUNI, NM

This study examines ceramic technology associated with little-known small sites occupied between 1540 and the late 1800s in the Bosson Wash area of Zuni, N.M. Preliminary analyses indicate that there is considerable variation in wares, temper, firing atmospheres, and vessel forms, possibly related to differences in site location and configuration. Preliminary analyses suggest little evidence for trade between site occupants and surrounding groups. Furthermore, a gap in the occupation of the valley is indicated by the near total lack of glazewares.

*Martinez, Antoinette (California-Berkeley)*

[11] SOCIOPOLITICAL INFLUENCES ON GENDER ROLES IN THE NORTH COAST REGION OF CALIFORNIA

Analysis of recent survey data from the Fort Ross region of northern California can not only be used to evaluate Kroeber's tribelet model, but can also help gauge the degree of change that came with early nineteenth century fur trade at Colony Ross. Differentiation in site size, function, and distribution through time will be used to help define changes in sociopolitical organization. This information can then be used to hypothesize how shifts in intensification, production, and labor associated with changes in sociopolitical organization may have altered the lives of the indigenous people, particularly women.

*Maschner, Herbert D.G. (Wisconsin-Madison) and Hoffman, Brian W. (Wisconsin-Madison)*

[47] THE EVOLUTION OF VILLAGE LIFE ON THE NORTH PACIFIC

General trends in the formation of permanent villages and in the size and spatial organization of houses are compared for the northern Northwest Coast, Kodiak Island, and lower Alaska Peninsula. Specific similarities in the diachronic development of villages are demonstrated after 3500 B.P. Diachronically, house floor size is shown to be a good indicator of increasing political complexity and is seen mostly after A.D. 500 to A.D. 1000. Villages are argued to first form in all areas a product of economic affluence combined with reasonably dense populations. Late intensification in village formation, at least in some areas of the north Pacific, appear to correlate with increasing levels of violent conflict.

*Masson, Marilyn (Texas-Austin)*

[55] COCIJO, ANCESTORS, AND THE ANNUAL CYCLE: REFLECTIONS OF SECULAR AND RELIGIOUS DIVISIONS OF POWER AMONG THE CLASSIC PERIOD ZAPOTEC

Ethnohistoric and ethnographic analogies illuminate ways in which rituals associated with Cocijo, the powerful Zapotec deity of rain and lightning, were used to express and maintain political power. Communication with Cocijo, aided by interceding ancestors, was a critical act which ensured the onset of rains for the agricultural cycle. The funerary contexts of Cocijo effigies suggest that they were used in calendrically-timed pilgrimages to tombs, in a manner comparable to the placement of Postclassic Maya effigy censers on ancestral shrines. Scenes of Cocijo effigies portray groups of impersonators in standardized regalia. Evidence suggests that such religious officials offset the power of secular leaders.

*Masters, Patricia M.*

[33] MORTARS AND MARINE PROCUREMENT IN SAN DIEGO COUNTY, CALIFORNIA

Mortars made from water-rounded cobbles are found extensively in submerged localities along the coast of San Diego County, but they are rare in terrestrial sites. The majority of mortar sites are near shore reefs and kelp beds. The BTC site, yielding hundreds of mortars, may represent an ancient cobble spit utilized as a mortar factory site. Its depth of 2-5 meters and a radiocarbon date of 4230 +/- 200 place the manufacture and use of cobble mortars in the Middle Holocene. 80% of the mortar sites are localities that could have been used for shellfish collecting or offshore fishing 4-5,000 years ago.

*Masucci, Maria (Drew University)*

[15] TEMPER, POTS, AND INTERREGIONAL TRADE IN SOUTHWEST ECUADOR

Trade is cited as a major factor in the rise of late prehistoric hierarchical societies in the northern Andean area. The organization of this trade and its role in societal developments has been difficult to define. Research in Southwest coastal Ecuador shows that pottery as well as tempering materials were moved between



regions. Only certain pottery types were transported and the imported tempering materials were limited to the manufacture of the fine paste decorated wares. The possible significance of the trade is considered through an examination of the types of items being transported.

*Mathews, Jennifer P. (California-Riverside)*

[5] THE BOX NI GROUP OF NARANJAL, QUINTANA ROO, AND EARLY ARCHITECTURE OF THE CENTRAL MAYA LOWLANDS

The distinctive Early Classic megalithic style of the northern lowlands did not exist in isolation, but rather shared a number of features with monumental architecture of the central Peten. One particularly striking example is the triadic platform grouping, found at Naranjal, Uaxactun, and other Late Preclassic sites of the central Lowlands. The temporal and geographic distribution of Maya triadic platform groupings are reviewed in conjunction with such shared architectural features as apron moldings and inset corners. These comparisons support the early dating of the megalithic style and help define the special characteristics of this northern lowland style.

*Mathkovszki, Ilona (Illinois-Urbana)*

[91] THE USE AND SIGNIFICANCE OF AQUATIC FOOD SOURCES IN A FLOODPLAIN ECOSYSTEM DURING THE NEOLITHIC PERIOD

The role of non-domestic resources in the subsistence practices of neolithic communities in the Great Plain of Hungary has received little attention. Current studies stress the importance of domestic plants and animals, and ignore the prehistoric environmental setting, and its influence on subsistence practices. A new model of the neolithic subsistence practices on the Great Plain is presented based on a new and comprehensive synthesis of paleoenvironmental data from the Great Plain, my recent analysis of neolithic fish remains from the area, fish biological information, and ethnographic data on the utilization of aquatic resources in the Great Plain during the 19th century.

*Mathews, Christopher (Columbia University)*

[62] PANOPTIC THEATRICALS: THE USE AND ABUSE OF ELEVATED SPACE IN COLONIAL AMERICAN PERFORMANCE

The panoptic metaphor has been fruitfully employed in the historical recognition of the means by which modern states established mechanisms of surveillance over their citizenry. First recognized in prisons and hospitals the mechanics of surveillance were interpreted as the means by which the modern state taught subjects to be citizens. This paper explores another venue of surveillance, the theater. The suggestion is that in the colonial theater of British North America the relationship of those in the elevated box seats and those on the floor is an experiment in the mechanisms of surveillance by the elite as they came to see their elevated seats as a stage for the demonstration of appropriate behavior.

*Mauch Messenger, Phyllis (Minnesota)* [Discussant 38]

*Mauldin, Raymond (New Mexico) and Jeff D. Leach (Ft. Bliss)*

[33] GRINDING ASSEMBLAGES AND ECONOMIC PATTERNS: AN EXAMPLE FROM THE AMERICAN SOUTHWEST

Ground stone research has often focused on specific tool types (e.g., manos) rather than the entire grinding assemblage. Here, we compare aspects of assemblages associated with food processing (manos, metates, mortars, pestles) from the Chihuahuan desert and the highlands of southern New Mexico to monitor aspects of economics in these two settings. Differences in tool type ratios and attributes of specific tools at sites within regions suggest that the highlands have diverse grinding technologies relative to the Chihuahuan desert. These patterns may reflect both the different resource structure and the overall adaptation extant in the regions.

*Maxwell, David (Arizona)*

[44] MARINE MATERIALS FROM CACHES AND PROBLEMATIC DEPOSITS AT TIKAL

Preliminary study of cache materials from Tikal reveals considerable variability, with a wide variety of lithic, marine, ceramic, and faunal materials described. While some caches consist exclusively of one class of materials, many show a mixture of items. This paper examines the relationship between marine objects (shell, fish remains, coral) and other artifact classes found in caches and problematical deposits. Correlations can be made between artifact types and the original environment of the marine items (beach, deep water, etc.). It is predicted that the degree of artifact elaboration will show a positive correlation with the degree of difficulty involved in obtaining a particular type of marine item.

*Maxwell, Timothy D. (Museum of New Mexico)*

[58] PREHISTORIC POPULATION CHANGE IN THE LOWER RIO CHAMA REGION OF THE NORTHERN RIO GRANDE

During the Rio Grande Classic period (A.D. 1325-1600) there was a dramatic population increase throughout the northern Rio Grande and its tributaries. In the lower Rio Chama region, changes in ceramic technology

and decorative motifs, the appearance of certain items of material culture, and the establishment of several large villages led archaeologists to posit migration into the region as an explanation for change and population growth. There have been few alternative explanations for this growth. Data from the lower Rio Chama region suggest that intrinsic population growth may have had a significant effect on overall population levels.

*Mayer-Oakes, William J. (Texas Tech University)* [Respondent to Pagano 3]

*McCafferty, G. (see McCafferty, S.)* [30]

*McCafferty, Geoffrey G. (Brown) and Sergio Suarez Cruz (CRP-INAH)*

[30] CHOLULA AND TEOTIHUACAN IN THE EARLY CLASSIC PERIOD: RECENT INVESTIGATIONS AT THE TRANSITO SITE (R106)

Close cultural ties between the urban centers of Cholula and Teotihuacan have long been assumed based on similarities in architecture and ceramic types, yet little contextual information has been available to evaluate the processes involved in this interaction. Recent excavations at an Early Classic period house in Cholula recovered deposits relating to domestic activities as well as an elaborate subfloor tomb. These materials (including ceramics, lithics, and figurines) are used to interpret cultural identities represented, while radiocarbon dates from the excavation permit the refinement of the Classic period chronology. Results of this analysis relate to questions of Cholula/Teotihuacan interaction in terms of economic, political, and religious spheres.

*McCafferty, Shariisse D. and Geoffrey G. McCafferty (Brown)*

[30] TLACHIHUALTEPETL: THE GREAT PYRAMID OF CHOLULA AS SACRED LANDSCAPE

Tlachihualtepetl, the Great Pyramid of Cholula, was the largest man-made structure of pre-Columbian Mesoamerica, built in a succession of building phases spanning both the prehispanic and Colonial eras. As one of the premier religious centers of central Mexico from at least the Classic period to the present, the meaning content of Cholula as a sacred landscape has undergone important systemic changes while maintaining an underlying structure of religious importance. During the Postclassic period the Great Pyramid acted as a cosmic portal for supernatural communication with both the heavens and the underworld. This paper examines the changing meaning content of the Pyramid using ethnohistorical, ethnographic, and archaeological evidence.

*McCartney, Peter H. (Arizona State)*

[98] MODELING PREHISTORIC AGRICULTURAL SYSTEMS IN THE TONTO BASIN, CENTRAL ARIZONA

The strong spatial correlation between natural drainage systems and platform mound sites in the Tonto Basin suggests that irrigation agriculture may have played an important role in the formation of Salado settlement systems during the late 13th century. A GIS database combining information on topography, hydrology, vegetation, soils and geomorphology is used to estimate the quantity and distribution of prehistoric arable lands in and around present-day Roosevelt Lake. The hypothesis generated by previous research that there were marked local differences in dry farming productivity is evaluated with added emphasis on the potential for irrigation agriculture.

*McClung de Tapia, E. (see Tapia-Recillas, H.)* [10]

*McClung de Tapia, E. (see Zurita-Noguera, J.)* [25]

*McClung de Tapia, Emily (Universidad Nacional Autónoma de México), Judith Zurita-Noguera (Universidad Nacional Autónoma de México), and Emilio Ibarra-Morales (Universidad Nacional Autónoma de México)*

[8] PALEOETHNOBOTANICAL EVIDENCE FOR POSTCLASSIC PLANT USE AND ENVIRONMENTAL CONDITIONS FROM XALTOCAN, MEXICO

Preliminary results of the analysis of plant remains including macrofossils, pollen and phytoliths, recovered from excavations at Xaltocan in the northern Basin of Mexico contribute to the reconstruction of Late Holocene environmental conditions in the area as well as to knowledge concerning plant use. Comparisons are made with evidence for plant use as well as paleoecological indicators from other subregions of the Basin of Mexico (Chalco, Teotihuacan) in order to outline general trends and specific variants.

*McCormack, William (California-Berkeley)*

[94] THE EVOLUTION OF LONG DISTANCE STONE PROCUREMENT SYSTEMS IN PALAEO-LITHIC INDIA

Surveys of the Vindhyan mountains south of the Gangetic plain indicate that the Son river valley is the probable source of toolstone materials at Upper Palaeolithic and post-Palaeolithic sites in the middle Ganges valley. These findings double the estimated maximum length of the largest known Palaeolithic procurement system in South Asia to 160 km and shed further light on economic events that culminated in the origins

of rice agriculture. The development of long distance procurement in the Upper Palaeolithic marks a transition from the use of local materials during the Lower and Middle Palaeolithic to one based on high quality imports. This change appears to represent a strategic shift from "expedient technology" to "personal gear" and signifies the emergence of curated technologies.

*McCorriston, Joy (Smithsonian Institution)*

**[73] THE FIBER REVOLUTION: AGRICULTURAL INTENSIFICATION IN ANCIENT MESOPOTAMIA**

Mass-produced textiles played a crucial role in the trade networks that sustained Mesopotamia's great urban centers in the third millennium B.C. Poor preservation, however, has made it difficult for archaeologists to trace the development of textile production from a generalized household activity to a specialized weavers' craft. This paper draws on archaeobotanical, archaeozoological, artifactual, and ecological evidence to argue that the transformation of textile production in Mesopotamia was linked to changing population pressure, agricultural intensification, changes in land use, and the development of a landless class. Changes in the social and economic organization of textile production can now be closely linked to these processes implicated in the emergence of complex societies.

*McCorvie, M. (see Morrow, C.)* [36]

*McCoy, F. (see McMabon, N.)* [73]

*McCoy, Patricia (Bureau of Land Management) and Robert E. King (Bureau of Land Management)*

**[102] "AN ENORMOUS AND CONTINUOUS BODY OF WORKABLE GRAVEL OF PROVED HIGH GOLD CONTENT;" APPROACHING TEN DECADES OF MINING, THE VALDEZ CREEK MINING REGION, ALASKA**

The Valdez Creek drainage of South Central Alaska was the site of a 1903 gold rush. Since then, mining has continued sporadically, with most operations until recently being relatively small scale. Beginning in the 1980s this changed. Today in Valdez Creek, Cambior Alaska, Inc. operates the largest placer gold mine in the state. Using slides, the authors will review the history of this region, focusing on the changing nature of mining activities which have occurred since the early 1900s. Implications for future management of historic remains from prior mining episodes will be discussed.

*McCutcheon, Patrick (Washington) and José A. Afonso (Granada)*

**[19] QUANTIFYING THE MECHANICAL BEHAVIOR OF CHERT FROM THE CENTRAL MISSISSIPPI RIVER VALLEY AND SOUTHEAST IBERIA, SPAIN**

The reduction of rocks into stone tools is possible through the initiation and propagation of cracks in a controlled manner. Control refers to predictability: a given force applied in a given mode will result in the detachment of a fragment with a particular size and shape within relatively narrow limits. Predictability can be evaluated by measuring the variability of mechanical behavior for a particular lithic raw material. We present the results of mechanical tests on unheated and heat-treated chert from the central Mississippi river valley and southeast Iberia, Spain.

*McEwan, Bonnie G. (San Luis Archaeological and Historic Site)*

**[101] TEN YEARS OF ARCHAEOLOGY AT MISSION SAN LUIS**

As the capital of Florida's western mission chain during the second half of the seventeenth century, San Luis de Talimali was one of the largest missions in *La Florida*. The townsite consisted of a church complex, fort, native council house, and Spanish and Indian villages. A decade of archaeological and historical research at each of the major areas of the site has provided a wealth of information about native and European responses to various facets of mission life throughout several generations of cohabitation.

*McFaul, M. (see Metcalf, M.)* [66]

*McGovern, Thomas H. (Hunter College, CUNY), Paul Buckland (Sbeffield), Andrew Dugmore (Edinburgh), Charles Schweger (Alberta), and Cynthia Zutter (Alberta)*

**[46] RAIDING THE LANDSCAPE: NORSE ENVIRONMENTAL IMPACT IN THE NORTH ATLANTIC**

Between ca. A.D. 800-1000, Scandinavian chiefly societies with a mixed maritime/agricultural economy expanded into the offshore islands of the North Atlantic. Colonizing the Shetlands, Orkney, Caithness, Hebrides, Faroes, Iceland, Greenland and Vinland, during the Medieval Warm Period, these settlers brought continental economies and expectations to a widely varied set of island ecosystems. In many regions, rapid degradation of flora and soils took place associated with social and climate change. Recent research coordinated by the North Atlantic Biocultural Organization (NABO) highlights the extent of premodern impacts.

*McGuire, R. (see O'Donovan, M.)* [7]

*McGuire, Randall (Binghamton University)*

**[93] DECOLONIZING ARCHAEOLOGY**

Many archaeologists have realized that the past is a locus of struggle and that what we as archaeologists say about the past is embedded in the power relations of that struggle. But this is not a simple clash between colonialist archaeologies of domination and nationalist archaeologies of resistance. The nationalist archaeology is itself always selective and used to legitimate inequalities of power within the nation. Thus decolonizing archaeology requires a critique both of our own position in the struggle and of the logic of nationhood that structures the confrontation.

*McHargue, Jan (California-Berkeley)*

**[44] ETHNIC STYLING—THE DEVELOPMENT OF SITE-SPECIFIC STYLES IN MAYA RELIEF CARVING**

Carved Maya stelae, lintels and wall panels are heavily invested with stylistic information about the identities of their makers. These messages are recorded not only in the written hieroglyphic texts and in the portraits of historical persons that appear upon the monuments, but also in the manner of presentation and carving, which I call style. Stelae styles were deliberate declarations of a city's individual identity, but within a broader overall identity as Maya. Identification and description of these styles will lead to an understanding of how the Maya defined the boundaries of these ethnic identities and the types of interactions that occurred between groups.

*McKee, Brian R. (Arizona)*

**[48] IDENTIFICATION OF STRUCTURE FUNCTION: A SWEATBATH AT THE CEREN SITE, EL SALVADOR**

The identification of structure function is often unsystematic, sometimes relying on a single diagnostic characteristic. Exceptional preservation through volcanic burial at the Ceren site offers an opportunity for detailed analysis of structure function. Structure 9 has been tentatively identified as a sweatbath (temazcal) based on diagnostic features present in known sweatbaths in the ethnographic and archaeological records. The structure is constructed primarily of clay, with a river cobble firebox and a wattle-and-daub domed roof beneath a thatch roof. Ethnographic examples provide clues of the use of this structure and its social role in this Classic Period village.

*McKillop, Heather (Louisiana State)*

**[76] PRODUCTION AND DISTRIBUTION OF ANCIENT MAYA SALT: UNDERWATER ARCHAEOLOGY IN SOUTH COASTAL BELIZE**

Models of Maya trade are evaluated by examination of production and distribution of salt from south-coastal Belize. Models include salt production to meet local needs; for coastal-inland transport; for inland trade for use by commoners with higher quality northern Yucatan salt reserved for elite use; for salt drying seafishes for inland transport; and for the long distance market. Ceramic and lithic analyses indicate that the trading port at Wild Cane Cay was the bulking point for coastal-inland trade from the underwater site of Stingray Lagoon and other salt production workstations.

*McMabon, Nancy (State of Hawaii, State Historic Preservation Division), Floyd W. McCoy (Hawaii-Kaneohe), Marcus Pillion (Wooster College), and Stavros Papamarinopoulos (University of Patras)*

**[73] PRE-ERUPTION LBA TOPOGRAPHY AND SHAPE OF THERA**

Ground-penetrating radar (GPR) has mapped the Late-Bronze Age (LBA) topography on Thera buried beneath thick volcanic deposits left by the catastrophic eruption ca. 1628 B.C., an eruption ranked fourth in explosivity during the past 100,000 years or so. In combination with geologic mapping and study of volcanostratigraphic relationships within the Minoan tephra deposit, we present an interpretation of the LBA paleotopography, particularly in the Akrotiri area adjacent to the excavation of the LBA city, and the pre-eruption shape of Thera. Buried valleys, sea-cliffs, soils, in addition to man-made structures, are clear in these data.

*McManamon, Francis P. (Archaeological Assistance Program-National Park Service)* [Discussant 92]

*McManamon, Francis P. (Archaeological Assistance Program-National Park Service)* [Forum Participant 1]

*McManamon, Francis P. (Archaeological Assistance Program-National Park Service)*

**[3] CHALLENGES FACING ARCHAEOLOGISTS IN THE 21ST CENTURY**

The enactment of the Archaeological Recovery Act must have seemed the culmination of a great struggle to its proponents. Yet the end of one road is the beginning of another and 20 years since Moss-Bennett. The archaeological world is decidedly different from 1974. Challenges facing archaeologists today and for



the next generation include: public understanding and; relationships with Native Americans and other descendants of those we study; organizing, providing and preserving archaeological information; preservation and access of collections; and *in situ* site preservation.

**McManamon, Francis P. (National Park Service) and Ellen Herscher (Archaeological Institute of America)**

**[38] THE OBLIGATION TO EDUCATE**

Archaeologists must reach out to the many publics to explain and enlist their support for the stewardship of the archaeological record. These educational efforts should cover both the methods and techniques of archaeology and the results of archaeological research. Archaeologists who are unable to undertake these kinds of activities must encourage and support the efforts of others. A number of archaeological organizations have public education programs underway. Cooperation and coordination among these organizations is essential to ensure maximum impact of public education and outreach efforts.

**McNutt, Nan (N.M.A. Education Consulting)**

**[52] APPLYING THE RIGHT YARDSTICK**

As archaeology education projects and products are developed for schools, museums and other public organizations, the need for sensitive and appropriate evaluations are vital for measuring outcomes. This paper will recount the steps in evaluating three diverse projects/products: (1) Project Archaeology: Saving Traditions, a curriculum project/product; (2) Field Studies in Social Sciences, a National Science Foundation teacher institute; and (3) Get a Handle on the Past, a traveling exhibit. These will demonstrate the importance of "up front" evaluation as well as "field testing."

**McPberron, Shannon (Pennsylvania)**

**[20] A REDUCTION MODEL TO ACCOUNT FOR MORPHOLOGICAL VARIABILITY IN LOWER PALEOLITHIC BIFACES**

A metric analysis of several hundred Lower Paleolithic bifaces from northern European sites reveals a consistent pattern of bifacial reduction. Biface morphology is largely a function of the intensity of bifacial reduction within the limits imposed by raw materials. When previously published data from other parts of the Old World are reexamined from this perspective the results are identical. This implies that, despite considerable morphological variability, biface technology was remarkably consistent throughout the Middle Pleistocene and that typological comparisons of biface variability must consider the stage of reduction of each assemblage.

**Méluzin, Sylvia (California State-Fullerton)**

**[48] THE TUXTLA SCRIPT AND THE ORIGINS OF WRITING IN MESOAMERICA**

The Tuxtla script, in being an early (if not the earliest) writing system in Mesoamerica, prompts investigation into not only its origins but also the beginning of writing itself in this culture area. Three points relevant in studying the beginnings of any writing system are discussed as well as nine categories of potential sources for hieroglyphic models. Five facets of Middle Formative Mesoamerica that could have affected writing beginnings there are then presented.

**Mendoza, Ruben (Colorado-Denver)**

**[66] ASSESSING THE HUMAN ECOLOGY OF THE COLORADO FRONT RANGE, 7500-1000 B.P.**

Current investigations by the University of Colorado at Denver are attempting to assess the impact of the alithermal on the human ecology of the Colorado Front Range (7500-1000 B.P.). In addition to providing an assessment of the 1992-1993 field seasons at the Crescent Rockshelter locality (Site 5JF148), this report reviews ongoing efforts to retrieve data pertinent to settlement and paleoclimatic patterns via a systematic program of auger testing, transect sampling, pH analysis, and pollen and radiocarbon tests. Implications from the data are reviewed in terms of the objectives of continuing investigations into the human ecology of the Crescent Rockshelter and the larger regional context of the Colorado Front Range.

**Merriwether, D. Andrew (Pittsburgh), David M. Reed (Pennsylvania State), and Robert E. Ferrell (Pittsburgh)**

**[106] ANCIENT AND CONTEMPORARY MITOCHONDRIAL DNA VARIATION IN MAYANS**

Mitochondrial DNA (mtDNA) variation was examined in ancient Mayans (Classic Period) from the Copan site in Honduras and from contemporary Mayans from the Yucatan Peninsula in Mexico. Ancient DNA was extracted from rib bones from archaeological sites. Contemporary DNA was retrieved from blood samples and cell lines collected from living Mayans. Frequencies of Schurr et al's (1990) four founding lineages differed markedly between these two Mayan populations, with types A and B being most frequent in contemporary Mayans and types C and D being the most frequent in ancient Mayans.

**Mertens, Steven (Illinois)**

**[91] THE EARLY UPPER PALEOLITHIC IN ROMANIA**

The nature of the transition from the Middle to the Upper Paleolithic in Europe has become the focus of recent debate. The majority of research concerning this transition comes from Western Europe or the

Near East. Recent research suggests that archaeological traits traditionally used to define the Upper Paleolithic in Europe are not applicable for the Early Upper Paleolithic in Romania. This paper will examine these traits and propose that major differences exist between the Early Upper Paleolithic and the Late Upper Paleolithic in Romania.

**Meskill, Frances (Texas-Austin)**

**[48] LANDSCAPE, CREATION MYTHOLOGY, AND BALL COURT: A PERSPECTIVE ON IZAPAN ART AND CONTEXT**

Increasing attention is given to the relationship between site planning and world view and its symbolic expression in art and architecture, particularly for the Mesoamerican area. For Izapa, southern Chiapas, NWAf reports cite significant connections between landscape and site layout; these and other studies stress the importance of creation mythology in viewing Izapan art. Connections are made by Schele and others between creation myth and the Mesoamerican ball court. In this paper, the Izapan landscape is viewed as potential model for ball court and as interpretive vehicle for certain art works. This perspective may inform relationships at other sites.

**Metcalf, Michael D. (Metcalf Archaeological Consultants), Patrick K. O'Brien (Metcalf Archaeological Consultants), Kelly J. Pool (Metcalf Archaeological Consultants), Steve Kalasz (Centennial Archaeological Consultants), and Michael McFaul (Laramie Soil Services)**

**[66] ARCHAIC PERIOD CHRONOLOGY AND RESOURCE UTILIZATION IN NORTHWESTERN COLORADO**

Excavations at 40 sites along a major pipeline route across northwestern Colorado and southern Wyoming allow a substantial revision of the Archaic Period prehistory of the region. Over 150 new radiocarbon dates and a sizable projectile point assemblage contribute to a refined chronology, and pollen, faunal, and geomorphologic analyses contribute to reconstructions of subsistence and paleoenvironments. House pit structures were excavated on five sites. Research is structured to focus on subsistence and group mobility. Although most of the occupations on the project were archaic in age, the PaleoIndian-Archaic and Archaic-Late Prehistoric transitions are represented as well.

**Michaels, George (California-Santa Barbara)**

**[49] CONCLUDING REMARKS: ALBERT SPAULDING AND THE CONTINUATION OF ARCHAEOLOGICAL SCIENCE**

**Mikkelsen, P. (see Hildebrandt, W.) [83]**

**Miksa, Elizabeth (Desert Archaeology, Inc.) and James Heidke (Desert Archaeology, Inc.)**

**[36] EXTENDING POINT COUNT DATA TO THE "REAL WORLD" OF CERAMIC TEMPER IDENTIFICATION**

Desert Archaeology, Inc., has developed petrofacies models for the identification of sand sources for sand tempered ceramics in the Tucson and Tonto Basins of Arizona. The petrographic point count methodology employed, however, is time-consuming and can only be applied to tens or hundreds of potsherds. Application of the model to the remaining thousands of sherds that require analysis is accomplished using petrographic data as the basis for careful description and discrimination of source sands in hand samples. The use of a flow-chart and representative samples for each source allows rapid identification of temper sources for thousands of sherds.

**Miller, Arthur G. (Maryland)**

**[55] TEXTS AND MURALS: THE PLACEMENT OF POWER IN ZAPOTEC IDEOLOGY**

Colonial Zapotec texts can serve as an interpretive tool in understanding pre-Hispanic Zapotec ideology. For example, a reexamination of the Period IIIa murals of Monte Alban Tomb 105 in the light of a study of extant Zapotec calendars written in Sierra Zapotec during the sixteenth century can reveal how the Zapotec may have physically constructed power relationships on their landscape and, specifically, where and when the Zapotec decided to build and move their cities. That the Zapotec world view was little affected by Spanish incursions into the Sierra, as well as a growing mass of data from various disciplines, counter the "up streaming" objection to the use of ethnohistoric data to explain the pre-Hispanic past and tend to support the validity of these insights into Zapotec ideology.

**Miller, Naomi F. (Pennsylvania)**

**[24] LATE CHALCOLITHIC ARCHAEOBOTANICAL EVIDENCE FOR ENVIRONMENTAL CONSTRAINTS AND "FOREIGN" INFLUENCE IN SOUTHEASTERN ANATOLIA**

Hacinebi Tepe, a fourth millennium B.C. site on the Euphrates, has two contemporary, but physically distinct components, an indigenous Late Chalcolithic one and an intrusive Uruk one (with Mesopotamian affinities). Archaeobotanical research on local Late Chalcolithic deposits has established the characteristics of the agricultural economy, and shown it to be similar to that of contemporary Kurban Höyük, about 100

km upstream from Hacinebi. As environmental constraints are necessarily shared, identification of differences between the archaeobotanical assemblages of the newcomers and the indigenous people would suggest how strongly cultural traditions influence agriculture and land use practices.

*Miller, Naomi F. (Pennsylvania)*

[39] LONG TERM VEGETATION CHANGES IN THE NEAR EAST

The Near East provides some of the strongest evidence for the profound, long-term impact of people on the environment, mainly because it has the longest continuous sequence of permanent settlement in the world. Human-induced vegetation change occurred at different rates over a broad area in a variety of ecological zones. Archaeobotanical evidence documenting these changes at Ain Ghazal (Jordan), the Euphrates valley, Malyan (Iran), and Gordion (Turkey) includes declining building timber diameters and increases in three proportional measures: anti-pastoral types in seed assemblages, distant or secondary forest types in charcoal assemblages, and seeds from dung relative to wood fuel quantities.

*Milliken, Randall T.*

[11] MULTI-VILLAGE, MULTI-FAMILY POLITIES OF THE SAN FRANCISCO BAY AREA

Contact period Spanish missionaries perceived the landscape of Central California's San Francisco Bay Area as having been controlled by dozens of land-holding groups, each with numerous villages within fixed territories some eight to ten miles in diameter. Mission baptismal records provide evidence that these "Naciones" numbered 200 to 400 persons and consisted of inter-marrying lineages. Residence was ambilocal and group endogamy varied from 50 to 80 percent. Call them tribes, tribelets, or polities, such groups were once common across North America. Unfortunately, we know next to nothing about the mechanisms of economic co-ordination and dispute settlement within the California groups.

*Mills, Barbara (Arizona)*

[12] SHIFTING SOCIAL AND POLITICAL CONTEXTS AND THE TECHNOLOGY OF CERAMIC PRODUCTION IN THE ZUNI AREA

The social and political contexts of craft technology at Zuni have shifted many times during the late prehistoric and historic periods. These shifts provide a backdrop for investigating the interplay between changing socio-political forms and technological variation. In particular, the impact of European expansion on Zuni ceramic technology is discussed, from the Catholic missions to the American period. The effects of this expansion include the introduction of new forms, the promotion of technology transfer among the pueblos, and the spatial and social reorganization of production.

*Milner, George R. (Pennsylvania State) and James S. Oliver (Illinois State Museum)*

[36] A GIS ASSESSMENT OF LATE PREHISTORIC LANDSCAPES AND SETTLEMENTS IN THE CENTRAL MISSISSIPPI RIVER VALLEY

First approximations of Mississippi River channels and wetlands in ARC/INFO, a Geographic Information System (GIS), are generated for the Cahokia site area. The GIS is used in evaluating the natural and social attractants to various parts of the valley and the emergence of sociopolitical complexity in the region. Wetlands exerted a strong influence on the positioning of Mississippian settlements, including mound complexes. The spatial data highlight a poor match between the disposition of prehistoric remains, including mounds, and conventionally defined sites. Moreover, they underscore a need to reevaluate the commonly accepted Cahokia settlement model.

*Milo, Richard G. (Chicago)*

[2] HOMINID MEAT PROCUREMENT AT KLASIES RIVER MOUTH: PRELIMINARY RESULTS OF A MICROSCOPIC STUDY

Preliminary results of a microscopic examination of the entire bovid assemblage from the Middle Stone Age layers at Klasies River Mouth Cave 1, in South Africa, suggest that the Middle Stone Age (MSA) hominids there were much more proficient at obtaining meat than has previously been thought. Cut marks and other disarticulation marks, some of them still containing fragments of stone tools, indicate that the Klasies hominids were, at the least, the dominant scavengers of large mammals on the landscape. Additional evidence hints that the Klasies hominids may have been capable of actively taking the largest and most dangerous bovids.

*Minar, C. Jill (California-RiverSide)*

[70] HANDLING RADIOCARBON SAMPLES IN THE FIELD: MYTHS AND REALITIES

A survey of archaeologists and field manuals revealed a surprising lack of consistency in methods for retrieving and handling radiocarbon samples in the field. Consultation with materials manufacturers and radiocarbon specialists suggested that some methodological concerns are unfounded. In other cases, methods used for retrieving and handling samples present unrecognized problems, especially for materials to be submitted for AMS dating. This paper will discuss the myths and realities associated with the collection and handling of radiocarbon samples by archaeologists in the field.

*Minns, Paul (Oklahoma) and Michael E. Whalen (Tulsa)*

[7] BALLCOURTS OF CHIHUAHUA

Ritual architecture (e.g., ballcourts, kivas, and mounds) is often used to define the extent and character of prehistoric regional polities. Based on the study of thirty structures (both ballcourts and "stone circles") from northwestern Chihuahua, we consider how differences between these structures are related to the dynamic history of Casas Grandes. There seems to have been communities within a short distance that competed with Casas Grandes during the early Medio period. In short, Casas Grandes may not have been as tightly unified a regional polity during its history as has been assumed.

*Miracle, P. (see O'Brien, C.)* [91]

*Miracle, Preston (Michigan)*

[91] SUBSISTENCE INTENSIFICATION DURING THE LATE GLACIAL/ EVIDENCE FROM THE EASTERN ADRIATIC

Recent advances in our understanding of the tempo and mode of Late Glacial paleoenvironmental changes provide a sound and provocative basis for modeling changing human-ecologies around the Pleistocene-Holocene transition. I develop a model of subsistence intensification as a strategy selected in the context of increased environmental risk, and examine it against Late Pleistocene faunal data from the Eastern Adriatic Basin, Europe. I suggest that mobility by itself could not mediate these fluctuations, and that Late Glacial hunter-gatherers also responded by intensifying the processing of bones in pursuit of extracting grease and fat and expanding dietary breadth by taking lower ranked resources.

*Mitchell, Douglas (SWCA, Inc.) and Michael S. Foster (Soil Systems, Inc.)*

[80] ASHES TO ASHES, DUST TO DUST: THE CLASSIC TO POSTCLASSIC TRANSITION AT PUEBLO GRANDE

Recent work at the large Hohokam village of Pueblo Grande in the Salt River valley of central Arizona has resulted in new information on the Classic to Postclassic transition, the Civano to Polvorón phase, in the Hohokam area. The data from Pueblo Grande indicates the Polvorón phase may have occurred somewhat earlier at Pueblo Grande than suggested for other Polvorón occupations. Changes in architectural styles, material culture, demography, and social organization between the Civano and Polvorón phases at Pueblo Grande are presented. Current models of phase transition are assessed as is the concept of the Polvorón phase in light of the Pueblo Grande data.

*Mitchell, Peter (Cape Town), John Parkington (Cape Town), and Royden Yates (Cape Town)*

[45] A TALE FROM TWO CAVES: THE ARCHAEOLOGY OF THE PLEISTOCENE-HOLOCENE TRANSITION IN SOUTHERN AFRICA

Recent analyses of materials from Elands Bay Cave and Sehonghong in ecologically distant parts of southern Africa allow us to detect differences and similarities in archaeological records from the same time period. Extrapolating out from these two sites to others, we begin to write a history of settlement change during a period of dramatic environmental transition. We believe there are implications here for the understanding of the biological, demographic, technological, and social histories of southern African people.

*Mitchem, Jeffrey M. (Arkansas Archeological Survey)*

[30] ONGOING MISSISSIPPIAN EXCAVATIONS AT THE PARKIN SITE IN NORTHEAST ARKANSAS

During a four month field season at Parkin Archeological State Park, excavations were concentrated in three parts of the main village site. In Locus 2, a trench that was excavated across the moat in 1991 was extended to search for a presumed palisade wall. In Locus 3, two previously-discovered structure floors were more fully exposed. In Locus 4, additional units were excavated to better define structure floors and associated features encountered in previous field seasons.

*Mitchum, B. (see Walker, D.)* [10]

*Mithen, S. (see Finlayson, B.)* [84]

*Mithen, Steven (Reading University)*

[27] EVOLUTIONARY PSYCHOLOGY AND PREHISTORIC ARCHAEOLOGY

The appropriate use of evolutionary theory in archaeology is one that focuses on individual behavior and makes explicit reference to human psychology. Other approaches, such as a group adaptationist stance, may provide useful heuristic devices, but ultimately lack theoretical credibility and will fail to provide an adequate account of culture change. By adopting an evolutionary approach to human psychology, and focussing our studies on *generic*, rather than *specific*, past individuals, we will gain a more profound understanding of the relationship between biological and cultural evolution. Arguments that this approach cannot be operationalized with archaeological data are challenged.



*Mock, Shirley (Texas-Austin)*

[76] THE NORTHERN RIVER LAGOON SITE: LATE-TERMINAL CLASSIC SETTLEMENT, SALTMAKING, AND SURVIVAL ON THE BELIZE COAST

This study considers the implementation and diversification of new economic strategies at the Maya site of Northern River Lagoon on the northern coast of Belize, Central America during the Late-Terminal Classic Period. Recent research supports previous interpretations of extensive salt production (sal cocida) for exchange and/or the preservation of marine-estuarine resources. It is proposed that coastal settlement and implementation of new economic activities were "survival" strategies adopted during the Late-Terminal Classic period to allay food uncertainties and shortages at inland sites.

*Moe, Jeanne M. (Bureau of Land Management) and Kelly A. Letts (Bureau of Land Management)*

[52] ARCHAEOLOGY EDUCATION: CAN IT MAKE A DIFFERENCE?

Can education alter values which translate into protection of archaeological sites and artifacts? The goal of Utah's Intrigue of the Past Archaeology Education Program is to teach young citizens to value and conserve the past. The program was launched in 1990 to combat vandalism of cultural resources. An evaluation of the program's instructional materials, their use in the classroom, and students' attitudes regarding archaeological conservation issues has been completed. This paper reports evaluation results and outlines future program directions.

*Moeller, Konnie L. (Argonne National Laboratory) and John F. Hoffecker (Argonne National Laboratory)*

[63] CULTURAL RESOURCES AND A GIS APPROACH TO LAND MANAGEMENT AND ENVIRONMENTAL COMPLIANCE

Cultural resources management and compliance is approached best within the broader framework of natural resource planning and land management. Argonne National Laboratory is assisting federal agencies with the development of a computer-based resource management system for large facilities. Spatial and textual data regarding surveys, archaeological sites, and historic buildings can be stored, manipulated, and displayed in the context of a larger environmental database (e.g., wetlands, vegetation, hazardous waste) using a Geographic Information System. Predictive modeling capabilities also streamline planning practices by coordinating archaeologically sensitive areas with other environmental compliance concerns.

*Monaghan, John (Vanderbilt University)*

[55] SACRIFICE AND POWER IN MIXTEC KINGDOMS

This paper examines sacrifice in ancient Oaxaca both as an expression of power, and as one of its material conditions. More specifically, it uses examples from the Mixtec kingdoms of the sixteenth century to argue that sacrifice, in addition to being an idiom through which questions of power were communicated, served as a transactional mode through which elites extracted resources from commoners. It goes on to suggest that this sacrificial mode of extraction correlated with particular religious roles played by elites, sometimes has implications for our understanding of the role of religion in the political evolution of Mesoamerican societies.

*Montgomery, Barbara (Statistical Research, Inc.) and J. Jefferson Reid (Arizona)*

[42] THE BROWN AND THE GREY: PEOPLE, POTS, AND POPULATION MOVEMENT IN EAST-CENTRAL ARIZONA

Decorated ceramics have long been used as markers of trade, population movement, and ethnic identity in the American Southwest. Undecorated ceramics have also functioned as ethnic markers. Brown wares have been equated with mountain people and gray wares with plateau people. Most of these studies have not distinguished the movement of pots from the movement of people. In this study, undecorated ceramics are shown to be useful in tracing population movement over short distances within a region, while decorated ceramics are limited to detecting movement between regions.

*Montgomery, John (Eastern New Mexico University) [Respondent to McManamon 3]*

*Moore, Jerry D. (California State-Dominguez Hills)*

[67] PREHISPANIC RITUAL AND HUMAN PERCEPTION IN THE PUBLIC ARCHITECTURE OF THE COAST OF PERU

The communicative element of ritual involves transmitting information between participants and observers of social dramas. When public ritual occurs in formalized spaces, architectural forms may reflect the modes of communication associated with particular rites. Using basic data about thresholds of visual and auditory perception, it is possible to suggest the modes of ritual communication that occurred in a built space. This approach is applied to a sample of public architecture of the North Coast of Peru. The analysis indicates major shifts in the organization of public ritual which marked fundamental reorganizations in prehispanic Andean societies.

*Moore, Lawrence (Heritage Resources Branch)*

[102] STUDYING THE MODERN WORLD: TRENDS IN HISTORICAL ARCHAEOLOGY

The scope of historical archaeology is now much broader than it used to be. No longer is the field just the study of colonial sites or an interest in European expansionism. It is the study of these and much more: Victorianism, industrialization, capitalism, acculturation, to name a few. Additionally, historical archaeologists are exploring regions beyond the New World—Africa, Asia, and a new look at the Old World. These changes necessitate an expanded definition for the discipline, one that incorporates all the topics studied. Suggested here is that historical archaeology studies the Modern Period, the late 15th century to the present.

*Moratto, Michael J. (INFOTEC Research, Inc.)*

[83] THE PGT-PG&E PIPELINE EXPANSION PROJECT: ARCHAEOLOGICAL RESEARCH GOALS, OBJECTIVES, AND METHODS

A five-year program of intensive field surveys and excavations involving 400 archaeological sites along the 1670-km route of a natural gas pipeline in ID, WA, OR, and CA was designed to address local, regional, and project-wide research problems focused upon variability in hunter-gatherer adaptive strategies. Paleoenvironments and cultural adaptations were investigated through a wide range of specialized studies. The results of these studies (geomorphology, tephrochronology, paleobotany, zooarchaeology, lithic analyses, x-ray fluorescence spectrography, obsidian hydration measurement, blood residue analysis, and others) have elucidated patterns of land use, sedentism/mobility, resource procurement, subsistence, and exchange over a span of 10,000 years.

*Moreno, Jeryll (Northern Arizona University)*

[104] THE IMPORTANCE OF HIGH-QUALITY PROTEIN ACQUISITION IN LATE SOUTHWESTERN PREHISTORY AND THE EXPLANATORY POWER OF NUTRITIONAL MODELS

The identification of an increased artiodactyl index has inspired some researchers to elaborate on the importance of high-quality protein acquisition in late Southwestern prehistory. This elaboration has led to the development of a nutritional model concerned with human dependence on low-quality protein maize. However, alternative possible explanations have not been adequately considered. Using archaeofauna from a late pueblo community in eastern Arizona, the artiodactyl index is calculated, bone density measures are formulated, and a cost surface analysis is conducted. These alternatives are weighted and the importance of high-quality protein in late prehistory, and the model, are assessed.

*Morris, L. (see Seeman, M.) [88]*

*Morrow, Carol (Southeast Missouri State) and Mary R. McCorvie (USDA-Shawnee National Forest)*

[36] GEOGRAPHIC CORRIDORS: MULTILAYERED CONDUITS OF EXPLORATION, CONQUEST, SETTLEMENT, AND TRANSPORTATION

Geographic factors shape, constrain, influence, and reflect human movement on the physical landscape. In North America, the need for interior access, combined with the danger of attack along the major waterways was an important impetus for developing the early major inland corridors of travel. The trans-Appalachian migrations of peoples into the Midwest stimulated the development of transportation corridors in this area, facilitating the movement of populations and material culture on a massive scale. The need for access to markets and services further drove the process of developing road networks. The development of late eighteenth/early nineteenth century roads in southern Illinois is examined to illustrate these processes.

*Morrow, Juliet (Washington University and OSA, Iowa)*

[88] CLOVIS LITHIC TECHNOLOGY: IMPLICATIONS FOR FLUTED POINT TYPOLOGY IN THE MIDCONTINENTAL UNITED STATES

Some researchers have made a strong distinction between eastern and western fluted points; some have claimed that true Clovis is not represented east of the Mississippi River. Western Clovis preforms and projectile points exhibit a highly distinctive biface reduction strategy. Examination of fluted point preforms from various eastern sites indicates that all of the characteristic hallmarks of Clovis biface reduction were employed in the manufacture of fluted points occurring in the midcontinental region of North America. From a technological perspective, the distinction that has been drawn between eastern and western Clovis points is not so clear as some have proposed and perhaps fluted point complexes in either half of North America are more intimately and chronologically related than has been suspected.

*Morse, D. (see Goodyear, A.) [56]*

*Mortimore, M. (see Stone, G.) [9]*

*Moser, Stephanie (Sydney)*

[40] EVOLUTIONARY IMAGES: HUMAN ANTIQUITY AND PICTURES OF THE "ETHNOGRAPHIC OTHER"

When archaeologists began to construct images of life in prehistoric times they drew on a number of different sources. Central among these sources were the pictures of "savages" living in far away lands. This

paper will explore the use of images to introduce evolutionary themes in the study of human history, and in particular, it will examine the role that pictures of the ethnographic "other" had in this process. A number of key texts on human antiquity from the nineteenth century, will be looked at in terms of the way that they utilized other visual traditions to inform their reconstructions of life in the past.

*Moss, M. (see Erlandson, J.)* [56]

*Moss, Madonna L. (Oregon) and Jon M. Erlandson (Oregon)*

[92] RADIOCARBON DATING AS AN ARCHAEOLOGICAL SURVEY TOOL IN COASTAL ENVIRONMENTS

Radiocarbon dating has traditionally been used by archaeologists as a post-excavation strategy to define the antiquity of features, strata, or assemblages within sites. In this paper, we argue that <sup>14</sup>C dating can be used as an effective research tool during archaeological surveys, especially in coastal areas where sites are often eroding rapidly. Using examples from the Pacific Coast of North America, we show how <sup>14</sup>C dating can be used as a regional survey tool to identify and examine changes in settlement patterns, population levels, paleoenvironments, technology, and socio-political organization.

*Motsinger, T. (see Phillips, D.)* [104]

*Motsinger, Thomas N. (SWCA, Inc.) and Mary-Ellen Walsb-Anduze (SWCA, Inc.)*

[7] SOCIOECONOMIC MUTUALISM AND CERAMIC PRODUCTION IN THE GILA BUTTE-SNAKETOWN REGION, SOUTHERN ARIZONA

The Gila Butte Site and Snaketown have long been suspected to have served as the focus of a specialized production and exchange system that supplied much of the Hohokam region with buffware ceramics. Recent investigations involving excavation, aerial photographic studies, ground-based survey, and ceramic analysis have yielded data that help clarify the nature of the socioeconomic relationship that developed between the two villages. This new evidence supports the hypothesis that raw material was extracted at Gila Butte, then transported via a still-visible road or trail to Snaketown, where ceramic production was completed and the distribution system originated.

*Mulbolland, S. (see Thompson, R.)* [25]

*Mulbolland, Susan C. (Minnesota-Duluth)*

[25] THE STATUS OF METHOD AND THEORY IN PHYTOLITH ANALYSIS

The growth of a discipline usually proceeds from specific project-oriented applications to a more general consideration of methodological and theoretical issues. Phytoliths have been reported for well over 100 years; at various times extensive research has occurred in different disciplines. The interdisciplinary nature of the field has encouraged a wide range of approaches. No single research strategy can address all the research problems to which phytolith data are applicable. Clear descriptions of methods and research designs are essential for comparison of data and project results, as well as continued growth of the field.

*Muller, Nancy (Massachusetts-Amherst)*

[62] A SPATIAL CONSISTENCY? WHITE SUPREMACIST STATE-SUPPORTED ARCHITECTURE: A COMPARISON BETWEEN PRISONS AND PUBLIC HOUSING PROJECTS

Spatial design determines an individual's sense of autonomy as well as access to community interaction. One way for the state to maintain White supremacy is to isolate so-called "undesirable" individuals in both private and public space. In the case of penitentiary design, spatial security is enforced by an internalized discipline which restrains undesirables within the institution. In the case of public housing projects, external communities are disciplined to remain outside the project. Both of these concepts serve as a symbolic statement by the state of its authority to "incarcerate" or purposefully exclude those people it deems "undesirables."

*Müller-Beck, Hans-Jürgen (Universität zu Tübingen)* [Discussant 45]

*Müller-Beck, Hans-Jürgen (Universität zu Tübingen)* [Discussant 56]

*Mullins, Paul R. (Massachusetts-Amherst) and James A. Delle (Massachusetts-Amherst)*

[62] THE ARCHAEOLOGY OF THE MODERN STATE: THE MATERIAL CULTURE OF DISCIPLINE AND SURVEILLANCE

This paper will survey the archaeology of formal institutions and informal mechanisms that define the modern capitalist state. Institutions and mechanisms ranging from prisons to theaters materially produced, circulated, policed and reproduced social behaviors which maintained state power relations. Institutions such as prisons, factories, and plantations, systematically structure state authority through the surveillance of individuals. In addition to these formalized institutions we will consider less systematic surveillance mechanisms, including urban space, newspapers, and the theater. This paper will consider how apparently dissimilar institutions discipline and observe social subjects in capitalist states.

*Murakami, Gail M. (International Archeological Research Institute) and Michael J. Kolb (Hawai'i Historic Preservation Division)*

[94] CULTURAL DYNAMICS AND THE RITUAL ROLE OF WOODS IN PRE-CONTACT HAWAII

Wood charcoal identification is ideal for the study of cultural dynamics if viewed as a class of material culture that actively reflects choices concerning domestic practices, ideology and ritualization, and political relationships. Archaeological evidence of ritual wood use from two temples in pre-contact Hawai'i, supplemented with ethnohistoric data, provides a test case that woods underwent significant social transformations between A.D. 1400-1820. Variation in wood use from these two sites demonstrates how the biological environment can be imbued with cultural meanings, meanings that in turn illuminate how elite political and ritual strategies interact with a society's biological environment and ecological landscape.

*Murphy, Larry (National Park Service)*

[41] INVESTIGATION OF AN INUNDATED TERRESTRIAL SITE OFF THE FLORIDA EAST COAST

The Douglass Beach Site (8SL17) is an inundated Archaic site overlain by an eighteenth century shipwreck. Distributions of Archaic artifacts were found to be relatively concentrated, considering the potential for site destruction as sea levels rose. Further results of the research are discussed, focusing on the terrestrial site and its relevance to understanding processes of inundation and preservation. Extrapolations are made about the location of other continental shelf sites. Two principles of site-formation processes relevant to inundated sites are presented.

*Murphy, Larry (National Park Service), M. C. Beaudry (Boston University), James Brown (Northwestern), and R. E. W. Adams (Texas-San Antonio)*

[38] BEYOND THE LAW, OR ABOVE IT? ETHICS AND THE COMMERCIALIZATION OF THE ARCHAEOLOGICAL RECORD

Among the issues discussed at the Reno workshop was a wide-ranging concern about actions by archaeologists and others that may lead to commercialization of archaeological materials. This involves any direct participation or collaboration by professional archaeologists in activities that result in the assignment of monetary value to or to enhance the commercial value of archaeological materials. The process of "commodification" goes beyond trade in looted artifacts. The principle of archaeological stewardship makes archaeologists responsible for their actions both in clear-cut cases of legality as well as in ill-defined areas of unintended or unanticipated effects of research, publication, and collaboration.

*Murray, Matthew L. (Harvard University)*

[91] ACTS OF ENCLOSURE: SOCIO-POLITICAL RITUAL IN IRON AGE CENTRAL EUROPE

Landscapes of the later Iron Age in Central Europe are characterized by large rectilinear enclosures known as "Viereckschanzen". These enigmatic monuments have been variously interpreted as fortifications, warehouses, and most recently as Celtic religious sanctuaries. A new approach to "Viereckschanzen" combines a critical examination of contemporary excavation data with a dialectical study of Iron Age landscapes to explore the character of the enclosures and their role in the processes of social change and political legitimation. These structures replaced burial places as formal arenas for socio-political discourse during the Late Iron Age and were not merely places of spiritual or supernatural enclosure.

*Murray, Tim (La Trobe University)*

[93] CONTINUITY AND DISCONTINUITY IN ABORIGINAL AUSTRALIA

In recent years the prehistoric archaeology of Australia has assumed great importance in debates about the identity of Australia and the place of Aboriginal Australians within the broader society. These debates have tended to focus around issues such as land rights and compensation which have themselves directly relied upon the demonstration of prior occupation and cultural continuity. This paper surveys the current relationship between Aboriginal people and prehistoric archaeologists in Australia.

*Nasb, Stephen (Arizona)*

[19] TREE-RING DATA AND THE HISTORY OF ARCHAEOLOGICAL INVESTIGATION: A COMPARATIVE CASE STUDY

Recently developed site oriented tree-ring databases provide information on tree cutting (and by extension) site occupation for prehistoric and ethnohistoric sites on and around the Hopi Mesas, Arizona. These data, when considered in conjunction with published dendrochronological and historic data from Walpi Pueblo, provide a sound basis for examining dynamics intervening between archaeological site formation, dendrochronological data, and archaeological investigation.

*Neck, R. (see Pfohl, M.)* [76]

*Neff, H. (see Cogswell, J.)* [78]

*Neff, H. (see Hodge, M.)* [8]



*Neff, Hector (Missouri)*

**[96] WHY ARCHAEOLOGISTS LIKE TO USE PHYSICS AND CHEMISTRY TO ANALYZE POTTERY**

Chemical and physical analyses of pottery are believed to contribute toward explaining variation in readily observable macroscopic characteristics (e.g., form, surface finish, etc.). But to formulate testable hypotheses to account for macroscopic variation, the meaning of chemical and physical variation first has to be clearly established. Examples discussed in this paper illustrate how geological, cultural, and analytical processes can contribute to the chemical variation identified in "provenance" studies. Means for identifying the source(s) of chemical variation are presented. Examples also show how, once the meaning of chemical data is identified, they can be used to test hypotheses about other observable variation, including variation underlying such units as culture historical "types."

*Neff, L. Theodore (Navajo Nation Archaeology Department and Pennsylvania)*

**[89] BLACK MESA ANASAZI: BURIAL PATTERNS: MOBILITY AND SITE ABANDONMENT PROCESSES**

Archaeological survey, excavation and analysis on Northern Black Mesa, Arizona, has produced an unparalleled data base for the study of mortuary remains from a regional perspective. Although some analyses of the spatial location of inhumations have been brought to bear on questions of Anasazi mobility and adaptation on Black Mesa, work to date has focused chiefly on physical anthropological questions. The underutilized perspective of grave spatial location is used to further evaluate mobility hypotheses, as well as to consider site abandonment processes. The paper utilizes mortuary data collected during recent Navajo Nation Archaeology Department excavations at 32 sites on Northern Black Mesa.

*Nelson, Ben A. (SUNY-Buffalo)* [Discussant 42]

*Nelson, Ben A. (SUNY-Buffalo)*

**[85] POWER AND POLITY IN THE BORDERLANDS: A MESOAMERICAN PERSPECTIVE ON THE AMERICAN SOUTHWEST**

Dimensions of the political organization of Southwestern populations are examined by comparison with their seemingly more hierarchical neighbors in northwest Mexico. Chaco Canyon, New Mexico, and La Quemada, Zacatecas, are used as case studies from which to draw comparisons on four manifestations of political power: labor investment in central places, scale of road systems, status differentiation in mortuary programs, and symbolism associated with ritual facilities. The comparisons point to significant differences in the construction of social power in the two regions, and yet reveal more similarity in the degree of status differentiation than is commonly assumed.

*Nelson, Greg C. (Oregon)*

**[90] DENTAL ENAMEL HYPOPLASIA AS INDICATOR OF PHYSIOLOGIC STRESS IN A SKELETAL SERIES FROM MALHEUR LAKE, OREGON**

Dental enamel hypoplasia has been shown to be a good indicator of non-specific physiologic stress occurring during the time of tooth crown formation (Goodman and Rose, 1990). For the Malheur Lake skeletal series 46% (24 of 52) of individuals exhibit at least one hypoplastic event. Although relatively high in comparison to other North American hunter-gatherer groups it is much lower than the rate of 66% found at Stillwater Marsh. These rates indicate that the inhabitants of the Malheur Lake area experienced relatively frequent episodes of dietary or disease stress during the early childhood years most probably related to weaning or fluctuations in food availability.

*Nelson, Margaret C. (SUNY-Buffalo)* [Discussant 84]

*Nelson, Margaret C. (SUNY-Buffalo)* [Discussant 49]

*Nesbitt, Mark (Institute of Archaeology-London)*

**[4] NEW ARCHAEOLOGICAL EVIDENCE FOR PRE-AGRARIAN DIET AND ENVIRONMENT IN NORTHERN IRAQ AND SOUTHEAST TURKEY**

The application of machine-flotation techniques has led to the recovery of large assemblages of charred plant remains from three contemporary (c. 10,000 uncal. B.P.) epipaleolithic sites: Qermez Dere and Me'lefaat in northern Iraq, and Hallan Cemi in southeast Turkey. These seed and charcoal remains offer the opportunity to compare developments in diet and environment in this region with evidence from the better known cultural sequence in the Levant, and to compare sites on a north-south environmental transect from Hallan Cemi (in oak forest) to Qermez Dere (on the border of the steppe).

*Neupert, M. (see Longacre, W.)* [71]

*Neupert, Mark (Arizona)*

**[71] CERAMIC STRENGTH TESTING MADE EASY: METHOD AND THEORY FOR MAINSTREAM CERAMIC ANALYSIS**

The measurement of ceramic strength provides insights into both the technology of pottery production and the performance of vessels during use. Thus, strength testing has a role in any comprehensive ceramic

analysis, providing additional lines of evidence for many research areas. A recently developed approach makes practical and reliable the strength testing of archaeological ceramics. Examples from the American Southwest illustrate the effective integration of strength testing into mainstream research designs. The application of strength data to several issues including technological change and regional variability, trade and exchange, and formation processes are discussed.

*Newman, Jay (U.S. Army Corps of Engineers)*

**[19] SOURCE DISTANCE EFFECTS ON LITHIC REDUCTION TECHNOLOGY**

A number of lithic studies have indicated that average flake weight (size) appears to be a direct reflection of the ease of lithic procurement with the greater the distance to the lithic source, the smaller the respective general flake size. Similar high-quality lithic materials from Pot Creek Pueblo and the Cerrita pithouse site of the Taos area of New Mexico provide an excellent situation for the study of the effects of lithic source distance on lithic material metrical attributes given the wide array of locally available and exotic lithic resources available at varying distances from the two archeological sites and incorporated and utilized within the individual settlements.

*Nichols, Deborah L. (Dartmouth College)* [Discussant 8]

*Nickens, Paul R. (U.S. Army Engineer Waterways Experiment Station), Lawson Smith (U.S. Army Engineer Waterways Experiment Station), and Maureen Corcoran (U.S. Army Engineer Waterways Experiment Station)*

**[35] PROCEDURES FOR IMPLEMENTING LONG-TERM SITE PROTECTION AND PRESERVATION IN THE COLUMBIA RIVER BASIN**

Numerous significant archaeological sites occur throughout the Columbia River system in the northwestern U.S. Past reservoir construction and ongoing operations activities along the rivers create many threatening impacts for these vulnerable resources. This paper discusses the development of some management-oriented procedures that are designed to provide basin-wide, long-term site protection and preservation results. These procedures include an analytical geomorphic methodology to identify and evaluate ongoing processes, a resource monitoring system to identify changing conditions in resource integrity, and a site protection process that will ensure long-term preservation for endangered sites.

*Nielsen, Axel E. (Universidad Nacional de Jujuy, Argentina)*

**[85] THE CONTROL OF SOCIAL REPRODUCTION: TOWARD AN ARCHAEOLOGICAL STUDY OF SOCIAL POWER IN QUEBRADA DE HUMAHUACA, ARGENTINA**

The emergence of social power can be related to the ability of certain sectors within a society to control economic, political, and ritual resources that are vital for the reproduction of the group. The systematic study of the spatial relationships between social units and evidences of production and consumption of various resources at both regional and intrasite levels produce substantial information on this subject. The analysis of archaeological data from Quebrada de Humahuaca (Jujuy Province, Argentina) within this framework, makes it possible to identify some of the sources of social power that characterized the socio-economic formations that developed in the area during the late Inka and Inka Periods (ca. A.D. 1000-1535).

*Nisbimura, Y. (see Goodman, D.)* [63]

*Nisbimura, Yasushi (Nara National Cultural Properties Research Institute) and J. Daniel Rogers (Smithsonian Institution)*

**[63] DEVELOPMENT OF STATE-OF-THE-ART GEOPHYSICAL EQUIPMENT AND TESTING FOR A JOINT U.S.-JAPAN STUDY OF NATIVE AMERICAN ARCHAEOLOGICAL SITES**

The Ministry of Cultural Affairs in Japan has sponsored a 5 year intensive study directed toward the engineering and development of state-of-the-art geophysical instruments strictly for applications in archaeological prospecting. Included in the ministry's instrument procurement are applications of spacecraft based 3-component magnetometers and other hi-tech instruments. The results of testing this new equipment at the Spiro site and other locations is presented.

*Norr, Lynette (Illinois-Urbana/Champaign)*

**[54] DIETARY INTERPRETATION OF DELTA-13 C IN ARCHAEOLOGICAL HUMAN BONE APATITE**

The stable carbon isotope ratios in archaeological human bone apatite carbonate, and the difference between the stable carbon isotope ratios in the carbonate and those of the collagen, provide useful dietary information beyond that of the carbon and nitrogen isotope ratios of the bone collagen. Studies of the stable isotope composition of human bone apatite and collagen from populations with coastal, agricultural, and nonagricultural diets are cited as examples for interpreting  $\delta^{13}C$  in bone apatite. Archaeological populations from coastal Central American sites are used as examples of consumers of isotopically complex diets in which human bone apatite carbon isotope values have contributed significantly to paleodietary interpretation.

*Novick, Lee (North Carolina Department of Transportation)*

[102] WASTE NOT: DEPRESSION ERA GOLD MINING IN NORTH CAROLINA

In 1799 gold was discovered near Charlotte, North Carolina, which became the leading gold producing state east of the Mississippi River prior to the Civil War. Mecklenburg County boasted 118 recorded gold localities, with mines often funded by out-of-state companies, and mining towns similar to those of the western frontier. They became less successful in the period following. With the New York stock market crash and a world economy tied to nations using the gold standard, gold fever hit North Carolina. Investors capitalized mines and local residents conducted small operations processing spoil piles from old mines. This paper explores archaeological evidence from these depression era gold mining sites.

*O'Brien, Chris (Wisconsin-Madison) and Preston Miracle (Michigan)*

[91] HOMINID PREY ACQUISITION IN THE BALKAN LATE PLEISTOCENE

We discuss temporal and regional patterns of hominid predatory behavior during the Late Pleistocene of the Eastern Adriatic region of Europe. Dental increment analysis is used to establish mortality profiles and season of acquisition for large ungulate taxa from the sites of Badanj, Kopačina, and Sandalja II. Results from increment analysis are contrasted with those from alternative methods, including crown heights and dental wear, to examine the potential effects of analytical methods on variation in acquisition patterns. Variation in prey acquisition is then examined in the context of competing explanations, including ecological determinants of prey availability and current regional models of hominid behavior.

*O'Brien, M. (see Cogswell, J.)* [78]

*O'Brien, Michael (Missouri)*

[27] THE HISTORICAL DEVELOPMENT OF AN EVOLUTIONARY ARCHAEOLOGY

Evolutionary archaeology, with its strict adherence to neo-Darwinian principles and focus on artifacts as phenotypic traits, is but one of several competing frameworks for understanding the differential persistence of variation in the archaeological record. Recent archaeological literature would suggest that the approach is beginning to figure prominently in the discipline, though it is clear that several important theoretical and especially methodological issues have not yet been addressed. Serious attempts to advance our understanding of the roles played by evolutionary processes such as selection and drift must be based on a firm understanding of the historical development of issues.

*O'Brien, P. (see Metcalf, M.)* [66]

*O'Connell, James (Utah) and Kristen Hawkes (Utah)*

[27] BEHAVIORAL ECOLOGY, ARCHAEOLOGY AND EVOLUTION

Archaeologists have a long-established interest in the evolution of human behavior but lack the theoretically well-grounded *operational* framework in which to pursue it. For nearly three decades, behavioral ecology has provided evolutionary biologists with just such a framework. Over the past ten years it has been employed productively by anthropologists as well. We review major elements of this paradigm, distinguish it from other evolutionary approaches now employed by archaeologists, and illustrate by example its applicability to the study of human behavior in both ethnographic and archaeological contexts.

*O'Donovan, Maria (Binghamton) and Randall H. McGuire (Binghamton)*

[7] THE ACTIVITY STRUCTURE OF CERRO DE TRINCHERAS

Little research has been done on Cerros de Trincheras sites that were widely distributed in the Sonoran desert of the American southwest and Mexico during late prehistory. The distribution of these sites indicates their key role in understanding inter-regional relations. Before we can understand inter-regional relations, we have to determine the functions of these sites. Explanations have focused on the defensive or agricultural advantages of terraced hill sites. Others maintain the sites were primarily villages. Our research at the site of Cerro de Trincheras, a regional center, in Sonora, Mexico indicates that it is a multi-function village.

*O'Rourke, Dennis (Utah), Ryan Parr (Utah), and Shawn Carlyle (Utah)*

[90] MOLECULAR GENETIC VARIATION IN PREHISTORIC INHABITANTS OF THE EASTERN GREAT BASIN

Mitochondrial DNA from over 35 burials recovered from the eastern margin of the Great Salt Lake has been screened for patterns of molecular variation. All samples have been individually radiometrically dated, and span the range 750-2,000 B.P.. One molecular marker (a nine base deletion) occurs in over 75% of these samples, and in comparable Anasazi samples, but is absent in two ancient Siberian samples examined. The frequency of the deletion is less than 40% in most Amerind groups, and is apparently absent from circumpolar populations, including Northern Athapaskan. Such molecular diversity provides context for assessment of prehistoric population movement and affinities.

*Oetting, Albert (Heritage Research Associates)*

[90] PREHISTORIC WETLAND ADAPTATIONS IN HARNEY BASIN, CENTRAL OREGON

The rich archaeological record of Harney Basin provides context for examining human burials from Malheur Lake. Archaeological research indicates that widespread use of the basin's lakes and marshes began

after 5,000 B.P. and was most intensive after 2,000 B.P. Site locations and certain tool types indicate a lacustrine subsistence focus for many sites. Large, diverse sites, including housepit villages, are found along stable lakeshores and in the mosaic of marshlands. Harney Basin was one of several well-watered basins in the northern Great Basin that supported prehistoric populations making intensive use of wetlands resources and residing near these resources.

*Oliver, M. (see Taborin, Y.)* [16]

*Oliver, J. (see Milner, G.)* [36]

*Oliver, José R. (Garrow & Associates)*

[56] ECOLOGICAL ADAPTATIONS IN THE LATE PLEISTOCENE-EARLY HOLOCENE TRANSITION PERIOD OF NORTHERN SOUTH AMERICA

Based on the available published data, this paper examines the nature and diversity of human responses (adaptation) in Northern South America to changing ecological and climatic conditions during the transitional period between the Late Pleistocene and Early Holocene (ca. 13,000-8,000 B.P.). Although paleoclimatic data in this region is still wanting and often disarticulated from archaeological correlations, the general trend appears to be one of increased adaptive radiations resulting in roughly contemporaneous yet divergent traditions. This paper will test the preceding hypothesis by reexamining whether the hard facts support it or not.

*Olsen, Nancy (New Mexico)*

[72] BANDELIER NATIONAL MONUMENT PICTOGRAPHS AND PETROGLYPHS; A PRELIMINARY STUDY

A preliminary pattern recognition study to identify contextual use of petroglyphs and pictographs taken from the Bandelier National Monument Inventory Survey cavates provides heuristic information about motif category organization. A Maximum Likelihood factor analysis delineates three potential patterns, a Chi-square test confirms a fourth. This study is a first step towards constructing mid-range evolutionary theory to explain the appearance of pictographs and petroglyphs in archaeological contexts. These preliminary patterns, defined beyond the intuitive level, present a methodology for studying rock art distribution across a spatial section of the Pajarito Plateau.

*Olson, Kirsten A. (California-Los Angeles), Anabel Ford (California-Santa Barbara), and Michael Glascock (California-Santa Barbara)*

[12] REGIONAL EXCHANGE AND LOCAL DISTRIBUTION: THE MANAGEMENT AND MEANING OF MAYA OBSIDIAN IN THE BELIZE RIVER AREA

Assumptions of centralized control over prestige goods are based on distributions of wealth and power inferred from settlement size and complexity. A good example is the Lowland Classic Maya obsidian trade. Throughout Mesoamerica, obsidian can be traced to highland sources that reveal long-distance connections. In the Lowlands, the obsidian industry has been traditionally associated with civic-ceremonial centers. Clearly, the Late Classic Maya elite effectively organized procurement, production and distribution of obsidian, yet the nature of centralized production has remained elusive. Data from the Belize River area present an alternative picture of decentralized control by elite in the hinterlands.

*Orcutt, Janet (National Park Service), Tineke Van Zandt (Michigan), and Robert P. Powers (National Park Service)*

[58] BIG PROBLEMS AT BIG SITES: INTERPRETING FORMATION AND GROWTH AT CLASSIC AND PROTOHISTORIC RIO GRANDE PUEBLOS

Despite nearly 100 years of investigation at large Classic and Protohistoric period Rio Grande pueblos, the formation and growth of these sites are poorly understood. Ranging from several hundred to over a 1000 rooms in size, with numerous roomblocks and plazas, these villages apparently supported hundreds of people over long periods of time. This paper uses chronological information, particularly tree-ring dates, to investigate patterns of internal site growth and to map episodes of big site construction across the region. Social, economic and climatic reasons for the development and maintenance of large aggregates are explored.

*Orr, Heather (Texas-Austin)*

[55] SACRIFICE PLACES AND THE RITUAL BALLGAME IN LATE FORMATIVE ZAPOTEC POLITICAL STRATEGY

An ideological substratum identifiable at Monte Alban and Dainzu interrelates creation, death, and rebirth through a ritual ballgame enacted at special sacrifice places. This pattern emerges in Late Formative Zapotec architectural programming, site layout, and iconography. The underlying mythological-ideological framework was wielded by Zapotec elite as a political tool during a period of intensified conflict and competition. The wider implications of this pattern include its appearance and manipulation at other Mesoamerican centers.



*Osborn, Alan (Nebraska-Lincoln)*

[51] SYMBOLS IN LIMBO: THE UTILITY OF POSTPROCESSUAL ARCHAEOLOGY

Postprocessual archaeologists have argued that material culture was used by societies to organize and manipulate their external world. Symbols, as ideological expressions, were incorporated into the design and fabrication of material items. Postprocessualists have suggested that symbols inherent in material culture underlie human motivation and action. Symbols have not been studied within their broader systemic, behavioral context. Symbolic information is vital for human adaptation yet it has rarely been viewed within an integrated perspective. This paper reexamines Hodder's study of Maasai material culture and symbols using socioecological theory and evaluates the utility of postprocessual efforts.

*Owen, Bruce (Programa Contisuyu)*

[43] WERE WARI AND TIWANAKU IN CONFLICT, COMPETITION, OR COMPLEMENTARY COEXISTENCE? SURVEY EVIDENCE FROM THE UPPER OSMORE DRAINAGE, PERÚ

The prehistoric Andean states of Wari and Tiwanaku were contemporary, yet little is known of their relationship nor their differences in organization because their territories seemed to have little or no geographic contact. Systematic site survey shows that significant populations of both states occupied the upper Osmore drainage, living in close proximity in interdigitated but distinct territories defined by altitude, land form, and differing approaches to irrigation. Relative dating, settlement pattern, architecture, canal locations, and other evidence shed light on the relationship between the two states and the fundamental characteristics that distinguished one from the other.

*Özdoğan, Mehmet (Istanbul University)*

[4] THE FORMATION OF NEOLITHIC CULTURES IN EASTERN ANATOLIA

Almost all models for the development of sedentary food-producing communities in the Near East have considered the Syro-Levantine lowlands as the nuclear zone and the eastern Anatolian highlands as a marginal zone. Despite the minimal number of sites yet excavated in eastern Anatolia, this area now stands as a major nuclear zone in the formation of Neolithic societies. The artifactual, as well as non-artifactual assemblages from these sites indicate the development of an indigenous mode of sedentary life, developing along parallel lines with the Syro-Levantine mode. This suggests sustained interaction between these two major culture zones.

*Pagano, Daniel N. (Advisory Council on Historic Preservation)*

[3] COMPREHENSIVE SYSTEMS DESIGN OF THE ARCHAEOLOGICAL COMMUNITY

During the twenty-first century archaeological resources will be consumed by accelerated and dynamic changes in our environment. Encroaching development, scholarly research and shifting legislative priorities will contribute to further depletion of the resource base. In order to flourish, professional archaeologists will need to transform their twentieth century approach and expand beyond academic, cultural resource management and regulatory perspectives. One alternative is to seek greater involvement from a spectrum of interested public in the creation of community based preservation efforts. A rationale and strategy for creation of new designs for community involvement in management of archaeological resources is presented.

*Paine, Richard R. (Southern Illinois University)*

[76] LET THEM EAT CHOCOLATE: POPULATION GROWTH, RESOURCE STRESS, AND THE RISE OF THE COPAN NOBILITY (A.D. 700-950)

Hazards analysis of 105 residential mound group occupations from Copan, Honduras, indicates that non-royal elite household survival was unaffected by the collapse of the royal dynasty circa A.D. 822. Architectural activity within elite households expanded during the Late Classic, after all ecological zones in the Valley had been colonized. Non-royal elite households continued to prosper into Copan's "collapse" period as resource stress increased abandonment rates of commoner households and royal monumental activity ceased. Implications concerning elite control of subsistence resources are discussed.

*Papamarinopolous, S. (see McMabon, N.)* [73]

*Parezo, N. (see Fowler, D.)* [38]

*Parker, R. (see Sheppard, P.)* [6]

*Parkington, J. (see Mitchell, P.)* [45]

*Parr, R. (see O'Rourke, D.)* [90]

*Parsons, Jeffrey R. (Michigan)* [Discussant 8]

*Parsons, Jeffrey R. (Michigan)* [Discussant 85]

*Pate, Donald (Flinders University)*

[104] STABLE CARBON ISOTOPE ASSESSMENT OF HUNTER-GATHERER MOBILITY IN PREHISTORIC SOUTH AUSTRALIA

The inland riverine Roonka Flat archaeological site is located 120 km north of the South Australian coast. The site was used as a burial ground throughout the Holocene. The Roonka Flat skeletal sample represents

the largest excavated prehistoric burial population in Australia. Bone collagen stable carbon isotope values indicate a greater use of non-local marine and/or arid interior foods during the Early Holocene than in the Late Holocene. These paleodietary results support conventional archaeological data from southeastern Australia that suggest increased hunter-gatherer territoriality accompanied by more efficient use of local food resources in the Late Holocene.

*Paulu, Ivan (Arizona State Museum)*

[91] ENCLOSURES OF THE EUROPEAN DANUBE NEOLITHIC

At the specific moment of the European Danubian Neolithic the formally unified group of circle enclosures appears within the central Danube area (Lower Austria and Southern Moravia) and adjacent countries (Bavaria, Bohemia and Slovakia). During the last two decades many of them were excavated or prospected by geophysics. They represent most probably the social centers of the sites and archaeologically documented division of the settlement areas.

*Peartree, E. (see Rolett, B.)* [6]

*Pearsall, D. (see Zhao, Z.)* [25]

*Pearsall, Deborah M. (Missouri-Columbia), Dolores R. Piperno (Smithsonian Tropical Research Institute), Robert A. Benfer, Jr. (Missouri-Columbia)*

[25] IDENTIFYING CROPS THROUGH PHYTOLITH ANALYSIS

One focus of phytolith research is identification of cultivated plants in the archaeological record. The way in which crops are identified differs among crops (use of diagnostics, evaluation of assemblages) and among researchers (multiple identification methods for maize, rice). We review the methodology of establishing identification criteria for crops. Approaches discussed include use of diagnostics, classification approaches (using shape, size), and statistical approaches, including multivariate techniques. We evaluate the strengths and weaknesses of existing methods and of the ways analysts address the problem of identifying crops.

*Pearson, Marlys (Massachusetts-Amherst)*

[62] "DELIGHT IN THE DISTRACTION AND RUIN OF FAMILIES": RUNAWAY WIFE ADVERTISEMENTS IN COLONIAL NEWSPAPERS AS A FORUM FOR CONTESTED POWER

Runaway wife advertisements in Colonial newspapers can be interpreted as attempts to control women through subjecting them to the public gaze. There they could be shamed, entreated, or threatened into coming home, or excoriated and humiliated in a final public good riddance. Although these advertisements are almost exclusively a male discourse, women's counter-strategies can often be discerned within them. This is especially true of those ads in which men feel compelled to respond to gossip, in itself a powerful agent of social control.

*Pedler, C. (see Adovasto, J.)* [69]

*Pedler, C. (see Carr, K.)* [69]

*Peebles, Christopher S. (Indiana University)*

[49] DATABASE AND "THE DIMENSIONS OF ARCHAEOLOGY"

Databases comprise representations and samples of reality; therein are recorded aspects of entities either real or imagined from a living present or a past that endures in the present. In the case of archaeology, the samples themselves are samples of surrogates that themselves represent past realities. The writings of Albert Spaulding express a deep concern with the ways archaeologists select samples, the ways in which they represent the durable remains of the past, and the ways in which they combine these representations to create prehistory. The methods he espouses in "The Dimensions of Archaeology" are directly applicable, although often ignored, in the construction of archaeological databases today.

*Peeler, Damon E. (Proyecto Especial Monte Albán) and Marcus Winter (Instituto Nacional de Antropología e Historia)*

[55] SACRED TIME AND SPACE AND THE GROWTH OF MONTE ALBÁN

Growth and development of the urban center of Monte Albán may have depended upon various manifestations of power, as well as economic and social factors. Recent work at this site suggests that, among these manifestations of power, specialized astronomical and calendric knowledge may have played a role in the foundation of Monte Albán and other Valley of Oaxaca sites. This paper examines how ideological factors may have contributed to urban development at Monte Albán.

*Pendergast, D. (see Chippendale, C.)* [38]

*Pennington, Susan J. (Minnesota)*

[25] TOWARDS THE ROUTINE INTEGRATION OF PHYTOLITHS INTO PALEOETHNOBOTANICAL RESEARCH

Phytoliths are a multifaceted data resource, which has been used in isolation to address many archaeological and paleoenvironmental research questions. However, an alternate approach is to view phytoliths as a

complementary data set. This approach allows the integration of phytoliths, both silica and calcium based, with macrobotanical and pollen data in order to describe a more complete archaeo-botanical record for any one plant. The author's preliminary research into magical and medicinal plants of the medieval period will highlight quantification issues as well as providing models for production, deposition, and recovery.

*Peterson, Jane (Arizona State)*

[9] SOCIAL INVESTIGATIONS INTO THE FORAGER/FARMER TRANSITION: SEXUAL DIVISIONS OF LABOR IN THE LEVANT

The temporal depth and richness of the Levantine archaeological record provide a unique opportunity to explore the nature and pace of changes in the sexual division of labor across the forager/farmer transition. Archaeological data supply the bases for defining a range of economic activities in both hunter-gatherer and agricultural contexts. An osteological study of muscle markings on cortical bone (enthesopathies) is used to infer how these activities were organized among men and women. Assumptions about prehistoric labor patterns embedded in existing models of the transition to domestication economies are assessed based on the results of this analysis.

*Peterson, John (Bureau of Reclamation)*

[86] RESOURCE MANAGEMENT STRATEGIES ALONG THE LOWER COLORADO RIVER

The Bureau of Reclamation is implementing proactive resource management strategies along the lower Colorado River through the use of systematic field surveys, ethnographic studies, and data integration. This program has focused new attention on the fragile earth figures and related manifestations that are located on the desert pavement. Earth figures are rare and threatened cultural resources. The program is designed to balance resource management mandates with research concerns through the use of non-destructive data acquisition techniques. The end product will be an information base useful for managers, scholars, Native Americans, and the public.

*Petit-Maire, Nicole (Laboratoire de Géologie du Quaternaire)*

[45] CLIMATIC CHANGE AND MAN IN NORTHERN AFRICA (SAHARA-SAHEL) DURING THE LAST TRANSITIONAL GLACIAL/INTERGLACIAL PERIOD

During the last glacial maximum (20–18 ka), the Saharo-Sahelian boundary was at 13°–14°N. During the last warm optimum (8.5–6.5 ka), it was at 22°N. Thus, in a span of some 10,000 years, more than 4 million km<sup>2</sup> switched from a desert environment to a liveable steppe where Neolithic man settled.

*Petruso, K. (see Ellwood, B.)* [70]

*Petruso, K. (see Harrold, F.)* [9]

*Pettigrew, Richard (INFOTEC Research) and Craig Skinner (INFOTEC Research)*

[83] OBSIDIAN HYDRATION STUDIES IN THE CENTRAL OREGON CORRIDOR: RESULTS OF THE FIRST CUT

Over 6,500 obsidian artifacts from 84 central Oregon archaeological sites were chemically characterized and examined for obsidian hydration rims during the PGT-PH&E Pipeline Expansion Project. Carbon for radiocarbon determinations is often lacking and obsidian hydration data often provide the only available chronometric avenue. This initial examination primarily addresses four topics: (1) relative hydration rates of different sources (using Mazama tephra as a temporal control); (2) preliminary calculated rates for several sources; (3) effects of sample size on hydration results and their implications in developing sampling strategies, and (4) anomalous hydration measurements associated with the 1350-year old Big Obsidian Flow in Newberry Caldera.

*Phillips, D. (see Blinman, E.)* [19]

*Phillips, Jr., David A. (SWCA, Inc.) and Thomas N. Motzinger (SWCA, Inc.)*

[104] PREDICTING LOCATIONS OF PREHISTORIC AK-CHIN FARMS: AN EXAMPLE FROM SOUTHERN ARIZONA

Excavations at the Maja Site in Arizona's Avra Valley revealed a Classic period Hohokam field house on the edge of the northern bajada of the Sierrita Mountains. Evaluation of conventional aerial and infrared satellite images indicates that the Maja Site and other sites in this part of the valley are located on alluvial fans where the potential for ak-chin style floodwater farming is greatest. By using similar remote-sensing data, it may be possible to predict the locations of open-desert farming communities in southern Arizona.

*Phillips, Laura S. (Larson Anthropological/Archaeological Services) and Lynn L. Larson (Larson Anthropological/Archaeological Services)*

[18] WEST POINT SUBSISTENCE ORGANIZATION: INSIGHTS FROM BOTANICAL, FISH BONE, AND SHELLFISH STUDIES

Results from specialist studies of fish bone, botanical, and shellfish assemblages are reviewed. Botanical analysis documents high sample carbon content and taxa diversity compared to other sites in the region.

Abundance of conifer bark and hardwoods used as fuel suggests importance of shellfish drying/smoking. Seeds and fruit pits indicate summer plant collecting activities. The fish bone assemblage has freshwater and marine species. Increases in salmon abundance through time may indicate changes in procurement practices or be due to taphonomic processes. Shellfish species preferred for drying ethnographically may demonstrate shifts in shellfish procurement patterns and importance of storage.

*Pierce, C. (see Adams, K.)* [19]

*Pike-Tay, Anne (Vassar College) and Randall White (New York University)*

[30] ARCHAEOLOGICAL SEASONALITY AND PREY DEMOGRAPHY: CONTRIBUTIONS FROM DENTAL ANNULI ANALYSIS OF THE KAMINURIK CONTROL SAMPLE

A brief summary of current results of a long term research project investigating the microscopically visible seasonal-annual bands in the teeth of a thoroughly documented control sample of nearly 1000 Canadian barren-ground "Rangifer tarandus" (caribou/reindeer) individuals of all ages, both sexes, and representing all seasons of death, is presented. Due to the size of the control sample from this highly seasonal environment, both the limitations and potential of Dental Annuli Analysis for informing archaeologists of the seasonality and age profiles of a wide range of prehistoric faunas are made explicit.

*Pillion, M. (see McMabon, N.)* [73]

*Pillsbury, Joanne (East Anglia)*

[10] RECENT FIELDWORK AT CHAN CHAN, PERU

This research report is a brief overview of the principal findings of a survey of the architectural sculpture at Chan Chan, a Late Intermediate Period site on the north coast of Peru. The survey, conducted in 1990–91, included the documentation and conservation of the major adobe reliefs and their architectural contexts as part of a larger investigation of the use of the visual arts in the late pre-Hispanic period in the Andes. Among other aspects, the investigation has yielded new data with bearing on the chronological sequence of the site, based on an analysis of the construction techniques used to create the architectural reliefs. Finally, the report will conclude with a discussion of a heretofore unreported relief depicting *Spondylus* shell divers uncovered in Ciudadela Uhle.

*Pinto, Diana G. (Greenwood and Associates) and Joan S. Schneider (California-Riverside)*

[86] MILLING-IMPLEMENT QUARRYING AND PRODUCTION BORDERING THE LOWER COLORADO AND GILA RIVERS: ARCHAEOLOGICAL, ETHNOGRAPHIC, AND HISTORICAL EVIDENCE FOR AN ABORIGINAL INDUSTRY

Recent work along the Lower Gila and Lower Colorado Rivers has identified extensive areas where grinding stones, handstones, and pestles were produced using stone quarried from certain bedrock outcrops. Processing tools played such an important part of the subsistence systems of the aboriginal groups that lived in the area, that a high energy investment was made in the production of those tools using specific stone of optimal quality. Data is presented that supports long-distance transport of quarried material. A hypothesis is proposed regarding the routes and method of transport.

*Piperno, D. (see Pearsall, D.)* [25]

*Piperno, Dolores (Smithsonian Institution)*

[48] EARLY FORAGING AND FARMING IN THE LOWLAND TROPICAL FOREST OF PANAMA

Phytolith, pollen, carbon, and diatom studies of lake sediments are used to reconstruct subsistence practices and associated environmental changes in lowland Pacific Panama from 11,000 B.P. until 4,000 B.P. The close of the Pleistocene brought changes in climate and vegetation no less profound than those which occurred at higher latitudes, and which have long have been associated with major economic shifts elsewhere in the world. Human modification of the watershed evergreen forest through frequent burning and creation of small clearings is evident at this time. Evidence for slash and burn cultivation is present by 6,000 B.P. Foraging and farming have deep antiquity in the lowland Panamanian forest.

*Pippin, Lonnie C. (Desert Research Institute)*

[75] ABORIGINAL POTABLE WATER RESOURCES IN THE SOUTHERN GREAT BASIN

Potable water was a vital resource for the aboriginal hunters and gatherers who occupied the arid regions of the Desert West. This paper reviews the nature of water resources that were available to aboriginal populations in a portion of the southern Great Basin, categorizes these resources in terms of their sensitivity to climatic variables and consequently their overall reliability, and finally, examines how variability in these resources may have influenced aboriginal cultural behavior and assesses the importance of water in shaping the cultural adaptations in the southern Great Basin.

*Pitblado, Bonnie (Arizona)*

[86] GETTING TO THE POINT: A 'BIG PICTURE' LOOK AT ROCKY MOUNTAIN PALEOINDIAN TRADITIONS

It is suggested that a fundamental dichotomy exists between Great Basin and Plains Paleoindian traditions. This dichotomy, reflected in projectile point technology, can be related to differences in subsistence strategy.



Rocky Mountain Paleoindian material in general, and an assemblage from southwest Colorado in particular, is viewed as more closely related to Paleoindian occupation of the Great Basin than to occupation of the Plains.

*Pitulko, Vladimir (Institute of the History of Material Culture)*

[94] AN EARLY HOLOCENE SITE IN THE SIBERIAN HIGH ARCTIC

The results of excavations at an early Holocene site on Zhokov Island in the DeLong Archipelago of the Siberian High Arctic are reported. The site's terrain and paleogeographic characteristics are discussed. Thirteen semisubterranean house pits have been identified and excavations have been made in two of these. Artifacts reflect a Mesolithic association, with microblades, bone and antler inset tools, and groundstone adzes. Radiocarbon determinations indicate a date of about 7900 B.P. Faunal remains indicate a hunting economy relying mainly upon reindeer and polar bears. The significance of the site in terms of the early penetration of the High Arctic by a continental hunting culture is discussed, with commentary on the state of knowledge about early Holocene cultural complexes in Northeast Siberia.

*Plew, M. (see Gould, R.)* [61]

*Plunket, P. (see Uruñuela, G.)* [30]

*Plunket, Patricia (Universidad de Las Americas) and Gabriela Uruñuela (Universidad de Las Americas)*

[30] IN SEARCH OF THE TEMPLE OF QUETZALCOATL: CHOLULA'S SACRED PRECINCT

During the Postclassic period, Cholula's Temple of Quetzalcoatl was one of the most important shrines of Mesoamerica, a place where kings were crowned and a center to which pilgrims flocked. Recent excavations on the grounds of the Convent of San Gabriel, where according to tradition the temple was located, have revealed a construction sequence that begins in the Classic period. This paper will detail the major findings of these explorations and discuss their relevance to the transition from Classic to Postclassic in the Valley of Puebla and the development of the Postclassic ceremonial center of Cholula.

*Pohl, M. (see Pope, K.)* [76]

*Pohl, Mary (Florida State), Kevin Pope (Geo Eco Arc Research), John Jones (Smithsonian Tropical Research Institute), Fred Valdez (Texas-Austin), and Ray Neck (Houston Museum of Science)*

[76] MAIZE AGRICULTURE IN MESOAMERICA: THE LOWLAND MAYA CASE

Our program of excavation and coring in northern Belize in 1991-93 revealed that maize appeared about 2500 B.C. and was accompanied by significant deforestation. Excavation of settlement contemporaneous with early agriculture revealed that activity focused on the margins of wetlands where inhabitants continued to hunt. Cultivation intensified after 1400 B.C. when environmental changes resulted in higher water levels and the formation of a fertile black soil in wetlands. We propose that the adoption of maize agriculture in wetlands facilitated political competitiveness and set the stage for the emergence of centralized political control after 1000 B.C.

*Pokines, James (Chicago)*

[84] FORM, FUNCTION, AND CONTEXT IN CANTABRIAN LOWER MAGDALENIAN ANTLER PROJECTILE POINTS

A category of Cantabrian (Spain) Lower Magdalenian (and Solutrean) antler point possessing an arch-shaped longitudinal profile, with a flattened area in its midsection probably used for hafting, may have functioned as a barbed point in the hunting kits of its manufacturers. As such, these points may have been precursors to the more elaborate multiply-barbed antler harpoons that, by definition, mark the Upper Magdalenian in Cantabria. Both a replication experiment and the archaeological context of this artifact type elucidate its probable hunting function: the spearing and subsequent holding of prey.

*Pookajorn, Surin (Sipakorn University)*

[56] HUMAN ACTIVITIES AND ENVIRONMENTAL CHANGES DURING THE LATE PLEISTOCENE TO MIDDLE HOLOCENE IN SOUTHERN THAILAND AND THE MALAY PENINSULA

Recent excavations at Moh Khiew and Sakai caves are part of the "Hoabinhian Research Project in Thailand (Phase 2)." The data generated from Moh Khiew Cave provide new insights on Southeast Asian prehistory. They reveal the long term habitation and activities of prehistoric people from the Late Paleolithic to the Late Neolithic, around 25,000 to 4,300 B.P. Furthermore, the burials found may help fill the gap in the study of human evolution in Southeast Asia. More importantly, the data from this cave excavation suggest a new point of view on stone tool traditions, nutrition, and environmental change.

*Pool, K. (see Metcalf, M.)* [66]

*Pope, K. (see Pohl, M.)* [76]

*Pope, Kevin (Geo Eco Arc Research), Mary Pohl (Florida State), John Jacob (Texas A&M University), John Jones (Smithsonian Institution), and David Lentz (Mississippi)*

[76] THE ORIGIN, EVOLUTION, AND DEMISE OF MAYA WETLAND AGRICULTURE IN NORTHERN BELIZE

Polygonal features in the swamps of Belize have been interpreted as ancient Maya wetland fields for two decades. Research by the Rio Hondo Project reveals that these features are of complex origin, including human modifications of a hummocky surface and true canal construction. Wetland agriculture focused upon swamp soils that became dry enough to cultivate without canals during an episode of a lowered water table ca. 1400 B.C. Water levels rose again ca. 110 B.C. to A.D. 200, apparently forcing the Maya to ditch, and ultimately abandon, their fields. Water table fluctuations are linked to regional sea level changes.

*Potter, D. (see Black, S.)* [19]

*Potter, James (Arizona State)*

[89] THE IDENTIFICATION OF COMMUNAL RITUAL WITH FAUNAL REMAINS: A CASE STUDY FROM THE DOLORES ANASAZI

Communal ritual is undoubtedly one of the most important yet archaeologically elusive components of middle-range societies. Faunal remains, and the use of several quantitative techniques, including computer simulation, are argued to be effective in the identification of communal ritual in the prehistoric record. Published faunal data from McPhee Village, an aggregated Pueblo I Anasazi community located in the Dolores region, and dating to the ninth century A.D., are used to test several ethnographically derived faunal expectations. Two types of ritual behavior are identified, communal feasting and the use of fauna for ritual paraphernalia.

*Powell, Mary Lucas (Kentucky) and Valerie Haskins (Kentucky Heritage Council)*

[59] TRADING OLD ACHES FOR NEW PAINS: CHANGING PATTERNS OF PALEOPATHOLOGY IN THE EASTERN WOODLANDS

The change from hunting/gathering to sedentary village life in the Eastern Woodlands exacted specific biological penalties: increased mortality for all ages, particularly weanlings; increase in bacterial diseases due to increased pathogen exchanges and a decline in community sanitation; a rise in chronic iron-deficiency anemia in response to infection and parasite loads and iron-poor diets; and the appearance of mycotic/mycobacterial opportunistic diseases among highly-stressed crowded populations.

*Powers, R. (see Orcutt, J.)* [58]

*Powers, William Roger (Alaska-Fairbanks)*

[56] SIBERIA IN THE LATE GLACIAL AND EARLY POST-GLACIAL

This paper examines environmental and cultural changes in Siberia during the Pleistocene-Holocene transition. During the early part of this interval, areas east of the Yenisei contain late Paleolithic Dyuktai-like assemblages. In northeast Siberia, non-Dyuktai assemblages are found. Between 10,000 and 11,000 years ago, Dyuktai-like industries spread to the northeast and replaced the earlier industry. By 10,000 B.P., Sumnagin industries appear in interior Siberia, while Dyuktai-like industries remain in the northeast and the south. The implications for the peopling of Beringia and the Americas are discussed.

*Powers-Jones, Alik (Cambridge)*

[25] PHYTOLITHS: A PROCESS-DRIVEN APPROACH?

This paper explores an alternative approach to phytolith studies: examination and identification of the processes involved in the accumulation of phytolith suites, rather than basic plant identification. I do not decry plant identification as a powerful, essential tool in the archaeologist's repertoire, but stress the potential for a parallel, process-driven approach. Understanding the processes by which ecofacts are deposited within a particular site can provide us with information about resource utilization and social organization, in circumstances where this information would otherwise be lost. Analyses of prehistoric sites in the Outer Hebrides of Scotland illustrate successful applications of this approach.

*Powis, Terry (Trent) and Bobbi Hohmann (New Mexico)*

[60] MIDDLE FORMATIVE ARCHITECTURE IN THE PERIPHERY OF CAHAL PECH, BELIZE: THE CASE OF TWO CIRCULAR PLATFORMS AT THE TOLOK GROUP

The discovery of two low circular platforms at the Tolok Group in the periphery of Cahal Pech may shed new light on late Middle Formative architectural techniques and practices. Evidence of several Late Formative and Late Classic period burials on these structures demonstrate their ritual importance to the community throughout the history of the Group. Also, the question arises as to whether round structures should be considered rare forms of architecture, as more of them are increasingly being found in close proximity to the surface and in various spatial contexts, particularly within the Belize Valley.

*Pozorski, Shelia (Texas-Pan American) and Thomas Pozorski (Texas-Pan American)*

[10] THE SECHIN ALTO COMPLEX: THE VARIATIONS AND INTERRELATIONSHIPS OF EARLY MONUMENTAL ARCHITECTURE

The Sechin Alto Complex, 10 square km in area, is the largest Initial Period (1800-900 B.C.) site cluster known in Peru. Although the complex was previously believed to comprise a late Initial Period polity within the Casma Valley, recent excavations at the component site of Taukachi-Konkan revealed that it dates considerably earlier. These new data indicate that the major early Casma Valley sites existed simultaneously and interacted extensively. This revised scenario provides a unique opportunity to assess both the varied functions that characterized discrete units of monumental architecture within the polity and the nature of interactions among sites and site clusters.

*Pozorski, T. (see Pozorski, S.)* [10]

*Prentiss, William (Frontier Archaeology, Inc.), Patrick F. Light (Frontier Archaeology, Inc.), James M. Welch (Frontier Archaeology, Inc.), and David D. Day, Jr. (Frontier Archaeology, Inc.)*

[105] LITHIC DEBITAGE AND FLAKE TOOL ASSEMBLAGE FORMATION AT TWO HIGH ALTITUDE SITES IN NORTHERN WYOMING

Flake utility indices are used to model and help explain the formation of complex lithic debitage and flake tool assemblages from two quarry related sites in the Big Horn Mountains of northern Wyoming. Mathematically derived experimental assemblage formation sequences are used to simulate the effects of reduction strategies, taphonomic agents, flake removal processes, and flake tool use/reuse sequences on the final appearance of archaeological assemblages. Archaeological data are interpreted as the result of dynamic, often complex behavioral and natural processes.

*Price, Barry (INFOTEC Research) and Timothy Canaday (INFOTEC Research)*

[83] PREDICTIVE MODELS AND SITE SURVEY: A 1,000-MILE TRANSECT

In the early planning stages of the PGT-PG&E Pipeline Expansion Project, INFOTEC Research, Inc. (IRI) developed a sensitivity model for predicting the distribution of historical and prehistoric cultural resources along the Project route. The model was based on historical, archaeological, and ethnographic surveys and related data available at that time (1988). Prior efforts to model site distribution in particular geographic zones were also considered, and the available data were combined to predict the types and spatial distributions of cultural resources expected in various environmental contexts along the pipeline corridor. The components of IRI's sensitivity model are evaluated, and predictions of site types, locations, and distributions are compared with data generated during the intensive survey.

*Price, Heather (California-Berkeley)*

[9] CONTEXT AND VARIABILITY IN UPPER PALEOLITHIC VISUAL IMAGERY: PRELIMINARY FINDINGS

Within a given time period and between populations exhibiting essentially the same general hunter-gatherer cultural adaptations, what is the significance of regional scale variation in the amount and kinds of cave wall and portable art? I will first establish the nature of Upper Paleolithic art in the Aude region of southern France. I will then consider various environmental, demographic and social explanations for why this evidence varies from that of neighboring regions such as the Perigord and the Pyrenees.

*Price, J. (see Goodman, D.)* [63]

*Price, T. Douglas (Wisconsin-Madison)* [Discussant 54]

*Price, T. Douglas (Wisconsin-Madison) and Anne Birgitte Gebauer (Wisconsin-Madison)*

[47] THE MOBILITY MYTH: AN EXAMPLE FROM MESOLITHIC NORTHERN EUROPE

The appearance of permanent settlement is thought to be one of the important thresholds on the pathway to more complex society. The assumption that hunter-gatherers were highly mobile until the Holocene has dominated archaeological perspectives for many years and strongly biased interpretation of the archaeological record. Evidence from Holocene northern Europe and elsewhere, however, suggests that settlement occupations may well have been sedentary far earlier than previously thought. This presentation will make the argument that sedentism may well have been the norm for human groups in coastal and other non-marginal zones deep into prehistory.

*Pritchard-Parker, Mari A. (California-Riverside) and John Torres (California-Riverside and INFOTEC Research)*

[33] CAN ECONOMIC AND SOCIAL BEHAVIOR ASSOCIATED WITH MILLING EQUIPMENT BE DETERMINED FROM THE ANALYSIS OF ANOMALOUS DEBITAGE?

The surfaces of milling equipment, which become slick through use by the abrasive forces of the mano against the metate, were mitigated prehistorically by re-roughening of the implement surfaces. It has been

assumed that this was accomplished through the use of a prepared, flaked stone edge. Our previous research shows this to be unnecessary (though it does not preclude it either). Analysis of the debitage produced during the re-roughening of experimental metates using various hammerstones was compared with that from archaeological specimens in an effort to characterize the re-roughening behaviors associated with milling equipment.

*Purdue, J. (see Chambers, K.)* [35]

*Pyburn, K. Anne* [Discussant 38]

*Quilter, Jeffrey (Ripon College)*

[32] THE RIVAS SITE PROJECT, 1992-1994

Three field seasons at the Riva site have revealed a scale and complexity of occupation previously undocumented for sites in southern Costa Rica. Two phases of monumental construction, extensive areas of artificial fill, and great amounts of pottery from outside the region have been encountered for an occupation from circa A.D. 900-1300. This paper will review significant finds to date, their implications for understanding the culture history of prehistoric Costa Rica, and their significance regarding the socio-political nature and dynamics of areas previously considered as "marginal" to Nuclear America.

*Quintanilla, Ifigénia (National Museum of Costa Rica)*

[32] CHRONOLOGY, SETTLEMENT PATTERNS, AND SUBSISTENCE IN THE SIERPE-TERRABA DELTA, COSTA RICA

A regional project in the Sierpe—Terraba Delta of southern Costa Rica has documented human occupations there from 1000 B.C. to A.D. 1500. These occupations show settlement patterns different than those of the tributaries and intermontane valleys in the upper and middle Terraba Valley. They also show the exploitation of estuarine and tropical forest resources in addition to mixed agriculture subsistence practices. These factors, in combination with unique elements of material culture, such as stone spheres, anthropomorphic and zoomorphic statues, and metallurgy, suggest that the Delta can be considered as a cultural unit within the Chiriqui archaeological region.

*Quitmyer, Irvy R. (Florida Museum of Natural History)*

[41] MOLLUSCAN FAUNA AS AN INDICATOR OF ENVIRONMENTAL CHANGE AT THE PALEO-INDIAN SITE OF PAGE-LADSON (8JE591), AUCILLA RIVER, FLORIDA

The Page Ladson Site (8JE591), located in the Aucilla River of west Florida, represents a stratified section dating to the late Pleistocene—early Holocene epochs. This deposit contains the remains of plants and animals associated with Paleo-Indians living around the site. Aquatic molluscan fauna excavated from Page-Ladson are sensitive indicators of environmental change. Quantified samples of 12 taxa of mollusk indicate fluctuations in water chemistry, water depth and the energy of the river over a 12,000 year period. The molluscan data coupled with the identification of other well-preserved plant and animal remains from Page-Ladson provide a record of the local environment and how it changed at the end of the Pleistocene.

*Raab, L. Mark (California State-Northridge)*

[92] REASSESSING THE AGE AND IMPORTANCE OF SOUTHERN CALIFORNIA MARITIME SOCIETIES AMONG ARCHAIC-STAGE CULTURAL ADAPTATIONS

Research during the last decade demonstrates occupation of the southern California coast as early as 11,000 cal years B.P. Scores of sites are now known with ages ranging between 8,000 and 10,000 cal years B.P., with many of the earliest dates in the California Channel Islands. Complex maritime economies and cultural interaction spheres linking the Channel Islands and the mainland existed at least as early as 5,000 years B.P. These data require re-examination of the marginal role traditionally assigned to maritime cultures in the development of Archaic-stage adaptations.

*Rafferty, Kevin (Community College of Southern Nevada)*

[75] GEOGLYPHS AND GROUND FEATURES IN THE SOUTHERN NEVADA REGION

Geoglyphs and ground features are being recorded with greater frequency in the southern Nevada region. Although geoglyphs, such as those associated with the Mojave/Patayan cultural tradition, are the most spectacular, other ground figures, including linear features and abstract designs, have also been encountered. This paper discusses several such features recorded in the last five years in southern Nevada, dealing with such questions as age, morphology, cultural affiliation, and potential significance as religious structures or territorial markers for groups that lived in the region.

*Rahemtulla, Farid (Simon Fraser)*

[30] TECHNOLOGICAL ORGANIZATION STRATEGIES IN THE EARLY PERIOD AT NAMU, ON THE CENTRAL COAST OF BRITISH COLUMBIA

Research on the early prehistory of the Northwest Coast has generally focused on delineating initial cultural-historical concerns. Recently, a mass analysis was conducted on lithic debitage from an Early Period



(11,000-7,000 B.P.) component at Namu, on the central coast of British Columbia. Results are presented, and preliminary interpretations on technological organization are discussed.

*Ramenofsky, Ann F. (New Mexico)*

**[58] INFECTIOUS DISEASES AND NATIVE POPULATION CHANGE IN NORTHERN NEW MEXICO**

Scholars working in the Spanish Borderlands outside the Southwest have demonstrated repeatedly that infectious diseases were powerful selective agents in the earliest centuries of European contact. In appropriate contexts, native populations suffered significant, if not terminal, population loss that affected the structure of native societies. In New Mexico, however, the survival and cultural vigor of native peoples suggests that the disease history may have been fundamentally different; these differences contributed to native persistence. The issue of whether or not infectious diseases caused significant population loss prior to 1680 is discussed.

*Rautman, Alison (Michigan State)*

**[37] REGIONAL IMPLICATIONS OF LOCAL SUBSISTENCE CHANGE: THE PITHOUSE-TO-PUEBLO TRANSITION IN CENTRAL NEW MEXICO**

Excavations at LA-2091, a thirteenth century pueblo in central New Mexico, show that change to puebloan architecture during this time period is associated with greater reliance on agricultural production. It is proposed that this change in economic organization altered the cultural perception of environmental conditions, affecting the definition of local resource stress as well as the utility of prior adaptive strategies for coping with that stress. During this time period, previously established social contacts (and ceramic exchanges) with groups in the Sierra Blanca region are supplemented by increased contact with groups in additional areas, particularly the Rio Grande region.

*Ravesloot, J. (see Simon, A.) [42]*

*Ravesloot, John C. (Gila River Indian Community)*

**[85] ARCHITECTURAL PLANNING AND DESIGN: SOCIAL AND RELIGIOUS SYMBOLS OF POWER AT CASAS GRANDES**

The prehistoric site of Casas Grandes located in northern Chihuahua, Mexico, is presumed to have served as the focal point of a complex regional system during the Medio period (A.D. 1200 to 1450) where political, economic, and religious activities were coordinated. The city's plan which included the construction of public, domestic, and religious architecture suggests a carefully thought out and controlled architectural design. This paper discusses how the Casas Grandes elite used architecture, in particular the placement and design of the mortuary complex and other religious structures, to communicate and legitimize ideas about the social order to the local populace.

*Raymond, Christopher B. (Kansas) and R. Jeffrey Frost (State Historical Society of Wisconsin)*

**[32] STONE TOOLS AND ASSOCIATED MATERIALS AT THE RIVAS SITE**

While the Rivas site has spectacular architecture and an inventory of ceramics, including a high proportion of fancy wares, the stone tool assemblage is not impressive at first view. Chipped stone tool remains are crude in manufacturing techniques while ground stone tools are in number. However, these patterns reflect distinct adaptive strategies of tropical forest cultures as well as the unique activities that occurred in the monumental sector of the site. The nature of the Rivas stone tool assemblage, variability in its characteristics, and implications for the understanding of Rivas society and culture will be explored in this presentation.

*Read, Dwight (California-Los Angeles)*

**[96] WHAT DO WE NEED TO KNOW TO DO QUANTITATIVE ARCHAEOLOGY?**

The cultural materialist framework assumes the answer to understanding the past lies in external relationships framed in terms of universal concepts such as rationality and optimality. The contextual, interpretive framework finds importance in the particularistic, symbolic framing of internal relationships. These perspectives find convergence in a properly framed quantitative archaeology. The quantitative approach requires homogenous data sets, which reflect the particular distinctions imposed on a continuous, natural world by a given group. What are those imposed, context specific relationships, and how do they map onto objects? An approach to this question, based on classification of utilized flakes, will be presented.

*Reanier, Richard E. (Reanier & Associates), Daniel H. Mann (Alaska-Fairbanks), and Michael L. Kunz (Bureau of Land Management)*

**[74] ARCTIC PALEOINDIANS AND ENVIRONMENTAL CHANGE**

The recently documented Northern Paleoindian presence at the Mesa site in arctic Alaska has led to a re-examination of the potential effects of climate and environmental change on these early cultures. Using palynological, plant macrofossil, geological, and ice core data, this paper reviews evidence for rapid climatic and environmental change in the region during the Paleoindian period, and summarizes new lines of evidence being gathered by the Mesa Project. The chronologies of the paleoenvironmental and archaeological records

are compared in order to demonstrate possible environmental constraints on high-latitude human occupation at the Pleistocene/Holocene boundary.

*Rechtman, Robert (California State-Dominguez Hills)*

**[94] FIJIAN ARCHAEOLOGY AND THE RECONSTRUCTION OF VILLAGE-LEVEL SOCIAL HIERARCHIES**

Ethnohistorical information in conjunction with archaeological data recovered from the excavation of two fortified villages on Wakaya Island, Fiji are used to assess material and organizational correlates of social rank. The correlates include the organization of village space, a housing hierarchy, and a hierarchy in mortuary ritual. Such hierarchies are identified, reflecting the existence of multiple levels within the society. I further suggest that the spatial relations documented in the archaeological record represent and reproduce the social relations that existed among the village residents.

*Redding, Richard W. (Michigan)*

**[4] THE ORIGIN OF FOOD PRODUCTION IN ANATOLIA: A TEST OF "FOREIGN" IDEAS**

During the last ten years considerations of the origin of food production in the Middle East have focused on data from the Levant. Recent excavations in Anatolia have provided a new data set to examine some of the ideas about the process of and explanations for the origin of food production. The Anatolian data are an important test set because the environment differs from that of most of the Levant. The Anatolian data provide insight on the relation of sedentism to food production and the function of domesticates in the earliest phases of this important shift in human subsistence behavior.

*Redman, Charles L. (Arizona State) [Discussant 26]*

*Redman, Charles L. (Arizona State)*

**[46] DECISION-MAKING, COMPLEX SOCIETIES, AND ENVIRONMENTAL IMPOVERISHMENT**

Archaeological information from several regions of the world is reviewed as it informs on human impact on the environment. The late prehistoric Southwest and early historic period in Mesopotamia are discussed in detail in an attempt to formulate general propositions relating to decision-making within a complex society and impacts to the surrounding environment.

*Redman, Charles L. (Arizona State)*

**[39] INTRODUCTION TO THE ARCHAEOLOGY OF GLOBAL CHANGE**

*Redmond, Louis A. (Nebraska National Forest) [Forum Participant 95]*

*Reed, D. (see Merriwether, D.) [106]*

*Reed, D. (see Whittington, S.) [106]*

*Reed, Paul (Navajo Nation Archaeology Department)*

**[72] THE COVE COMMUNITY: A PUEBLO I-II ANASAZI SETTLEMENT IN RED VALLEY, NORTHEASTERN ARIZONA**

Research undertaken in conjunction with the Cove-Red Valley Archaeological Project in northeastern Arizona has revealed the presence of a large Anasazi community. The community dates to the Pueblo I-II period, encompasses at least 40 distinct habitation structures, and is centered on a Great House and Great Kiva. This community, henceforth known as the Cove Community, is unique given its isolated location between the Lukachukai and Carrizo mountains. This paper characterizes the Cove Community and places it within a cultural, economic, and sociopolitical context vis-a-vis other Anasazi communities and Chacoan Outliers of the San Juan Basin.

*Reese, R. (see Rowe, M.) [103]*

*Reese-Taylor, K. (see Walker, D.) [10]*

*Reese-Taylor, Kathryn (Texas-Austin), Debra Walker (Florida International), Fred Valdez, Jr. (Texas-Austin), and Kenneth Liss (Minnesota)*

**[44] EVIDENCE FOR A SYMBOLIC BALLCOURT AT CERROS, BELIZE**

Recent excavations from the site of Cerros revealed a miniature ballcourt on the central plaza. Because of its size, the ballgame could not have been played on this diminutive ballcourt. Therefore, we explore alternate functions related to symbolic interpretations. Metaphorical references to raised fields and clefs in mountains place the Cerros ballcourt within the prevailing Mesoamerican cosmology. Archaeological evidence indicates that the ballcourt may have directed the flow of traffic during ritual processions. In addition, data suggest that all ballcourts at Cerros may have channeled the flow of water from the interior of the civic center to the surrounding drainage canal.

*Regan, Marcia (Arizona State), Joel D. Irish (Arizona State), and Christy G. Turner, II (Arizona State)*

[98] SKELETAL AND DENTAL INDICATORS OF HEALTH AMONG THE SALADO FROM TONTO BASIN, ARIZONA

Preliminary skeletal and dental analyses of human remains recovered near Roosevelt Lake, Arizona, imply that the —prehistoric Salado enjoyed superior health relative to other contemporary Southwest populations. Comparatively low occurrences of cribra orbitalia, porotic hyperostosis, dental caries, calculus deposition, enamel hypoplasia, and alveolar resorption suggest that the Salado had a well-balanced diet, perhaps consisting of large amounts of wild foods (e.g., game and native plants) in addition to maize. Relatively tall adult stature also indicates good (childhood) nutrition. These findings support the concept of the Tonto Basin as an area rich in natural resources and agricultural potential.

*Reid, Dawn M.*

[5] SACBEOB (ROADWAYS) AND INTERACTION IN THE NORTHERN MAYA LOWLANDS: INITIAL INVESTIGATIONS IN THE YALAHAU REGION

Maya sacbeob, or roadways, are extremely important in the reconstruction of political systems in the Northern lowlands of Mexico, where inscriptions describing alliances are scarce. Investigations at the Early Classic site of Naranjal revealed both inter- and intra-site roadways, which are described and compared to others in the region. Evidence of a political hierarchy within the site and interaction with neighboring sites and centers in the northern lowlands is discussed.

*Reid, J. (see Montgomery, B.) [42]*

*Reilly, Frank K., III (Southwest Texas State)*

[55] COSMOLOGY AND POLITICAL POWER WITHIN THE OTOMANGUEAN AREAS OF THE MIDDLE FORMATIVE MEXICAN HIGHLANDS

The artifacts, symbols, and motifs created in the Olmec style during the Middle Formative Period should be classified as ritual objects that functioned in a geographically dispersed ceremonial complex. This Middle Formative Ceremonial Complex (MFCC) is defined as the shared thematic focus through which ideology and rulership were visually expressed throughout Middle Formative Mesoamerica. The symbols incised on a green stone figure from the Oaxaca area clearly demonstrates that the Otomanguan speaking peoples of the Mexican highlands contributed significantly to the development of both the art and ideology of the Middle Formative Ceremonial Complex.

*Reinbard, Karl (Nebraska) and John Dendy (Washington University)*

[22] DIET AND DISEASE AMONG THE CHINCHORRO: COPROLITE EVIDENCE

Previous analysis of Chinchorro diet indicated that this culture was almost exclusively marine dependent. Analysis of coprolites recovered from mummies shows that although marine dependent for animal protein, the Chinchorro had a well-developed, broad-scale foraging strategy for wild plants. This aspect of subsistence had not previously been detailed. The dependence on marine fish resulted in parasitism with *Diphyllobothrium pacificum*, a fish tapeworm.

*Reitz, Elizabeth (Georgia) and Elizabeth S. Wing (Florida)*

[65] RICE RATS OF THE NORTHERN LESSER ANTILLES

Rice rats, Oryzomyine, were intensively exploited in the Lesser Antilles during prehistoric times, though they are now extinct throughout the West Indies. Comparison of the relative abundance of rice rats in assemblages, measurements of skeletal elements, and estimates of individuals' ages provide insights into the importance of this resource. Particular emphasis is placed on the relationship between size and the intensity of predation on these density-dependent rodents. Evidence for the transport and management of this resource will also be presented. This research is based on faunal samples from the following islands: Montserrat, St. Martin, St. Eustatius, Nevis, and St. Kitts.

*Renken, L. (see Creamer, W.) [58]*

*Rbodd, Benjamin (State of South Dakota Archaeological Research Center) [Forum Participant 95]*

*Rbode, David (Desert Research Institute)*

[37] OBSIDIAN STUDIES AT YUCCA MOUNTAIN, NEVADA: SOURCING AND REGIONAL CHRONOLOGY DEVELOPMENT

Obsidian artifacts from Yucca Mountain, Nevada, are used to examine diachronic regional patterns of artifact transport and chronology of landscape use. Eight known obsidian sources are represented: most obsidian was obtained locally, but some came from sources several hundred km distant. The greatest diversity of sources is from Early and Middle Archaic contexts; Late Archaic artifacts are almost exclusively locally derived. Chronology of regional landscape use is developed using obsidian hydration. An important constraint

is the temporal resolution attainable by this method. Measurement of variables relevant to hydration rate allows estimation of the temporal resolution possible.

*Rice, Don S. (Southern Illinois University)*

[39] THE HUMAN IMPACT ON LOWLAND MESOAMERICAN ENVIRONMENTS

The population history of the Mesoamerican lowlands provides a rich foundation for study of the human role in environmental change. At several important chronological junctures it is possible to chart the impact of colonization and later population growth on biodiversity throughout the region. The implications of studying long-term human impact on the environment are significant to a variety of biodiversity studies currently underway. The results of archaeological work indicate direct and sustained human modification of entire ecosystems. These results will require biologists to modify their models of floral and faunal diversity and interaction.

*Rice, G. (see Jacobs, D.) [26]*

*Rice, G. (see Lincoln, T.) [50]*

*Rice, Glen (Arizona State) and David Jacobs (Arizona State)*

[98] SALADO PLATFORM MOUNDS AND SETTLEMENT NETWORKS IN CENTRAL ARIZONA

Settlement pattern data are used to estimate changes in the size and organization of the prehistoric Salado (ca. A.D. 1270 to 1450) population in Tonto Basin, Arizona. Salado platform mounds functioned as centers for networks of related settlements. Of about a dozen networks in the valley, three were particularly successful through time. These three mound centers were rebuilt and expanded, and large satellite communities were established in the surrounding areas. Elsewhere networks collapsed into single, large communities or were completely abandoned. Explanations are sought for the success of some networks and the apparent abandonment of others.

*Richards, R. (see Stafford, C.) [97]*

*Ricketts, Robert A. (Coastal Archaeological Research)*

[92] TRACKING THE EFFECTS OF SEA LEVEL CHANGE ON BIOTIC ECOSYSTEMS AND HUMAN ADAPTATIONS ON THE TEXAS GULF COAST

The chronology of stratigraphically discrete shell midden components on the central Texas coast suggests that the region saw three major periods of human occupation and exploitation of shoreline resources: ca. 7500-7000 B.P., 5900-4200 B.P. and after 3000 B.P. These periods correspond to times of postulated Holocene sea level stillstand, whereas the intervening periods correspond to times of rapidly rising sea level, postulated independently on the basis of geologic data. Drawing upon fundamental biophysical principles of estuarine ecology, it is inferred that rapidly rising sea level adversely affected estuarine productivity, rendering coastal estuaries unattractive for human occupation.

*Ricks, Mary F. (Portland State)*

[61] ROCK ART AS ARTIFACT: THE WARNER VALLEY ROCK ART INVENTORY

Warner Valley, Oregon offers an exceptional laboratory for the study of Northern Great Basin rock art. A data base, incorporating information about rock art and its archaeological context in 150 valley sites, allows rock art to be treated as artifact. The data base facilitates analysis of spatial distribution of rock art sites and design styles, and allows examination of relationships between rock art and other artifacts within the sites. Rock art is most dense and most diverse in sites which appear to have been occupied by relatively larger groups over extended time periods, and usually appears to serve a public function.

*Rindos, David*

[27] MODELING COLONIZATION: ADAPTATION, VARIABILITY, AND CULTURAL CHANGE IN AMERICA AND SAHUL

The mode and tempo of the initial human colonization of continental regions is a controversial topic in archaeology. A Darwinian model is developed which reconsiders colonization in a unified manner. I suggest that selection would favor demes with subsistence strategy leading to low extractive rates and, hence, low realized environmental carrying capacities. This strategy would have brought about fast colonization. The model, developed for the Pleistocene colonization of Sahul, is tested against data from Clovis Period North America, where temporal imprecision is substantially smaller and the speed of colonization may be considered along with modes of adaptation.

*Ringle, W. (see Hanson, C.) [76]*

*Ringle, William (Davidson College) [Discussant 5]*

*Riseman, William (William Riseman Associates)*

[67] 3-D COMPUTER RECONSTRUCTIONS: CREATING VIRTUAL ANCIENT BUILT ENVIRONMENTS

This demonstration is intended to demystify the use of computer-aided visualization techniques in archaeology. Among the techniques to be discussed are: scanning, tracing, and enhancing photographs; 3-D vector



modeling; and 3-D solid model rendering. The presentation will focus on the ancient cultural landscapes of Egypt and Nubia, and conclude with an animated and interactive, 3-D computer-generated, virtual ancient built environment.

**Ritter, Eric (Bureau of Land Management)**

**[57] EXPLAINING REGIONAL DIFFERENTIATION IN CENTRAL BAJA CALIFORNIA'S ROCK ART**

Ethnographically the Central Desert of Baja California, Mexico was occupied by the Cochimi who linguistically have been divided into northern and southern dialectal regions. Late prehistoric pictograph motif complexes, probably manufactured by proto-Cochimi peoples, appear to vary by dialectal region with the naturalistic Great Mural art found to the south and the Northern Baja California Abstract art occurring in the north. This separation of style and context in the principal central peninsula rock art is hypothesized as an outgrowth of internal societal variation and changes in demography and mobility/residence patterns between related peoples of relatively richer (south) and poorer (north) upland resource zones.

**Robb, John E. (Michigan)**

**[91] EVOLUTIONARY CONSEQUENCES OF A SYMBOLIC CURRENCY: THE CASE OF LATE NEOLITHIC ITALY**

In Tribal social dynamics, what is critical is not prestige *per se* but rather its symbolic organization. The formation of a "symbolic currency," symbolically interdependent with ideologies of gender and personal identity and generalized to apply to multiple situations, is a key threshold between Great Man to Big Man societies. In Late Neolithic-Bronze Age Italy, a symbolic currency based upon male gender ideology provided new motivations for exchange and production intensification, linked individuals in new group formations, and made possible new settlement systems. The resulting interconvertibility of prestige from varied activities also allowed the rise of centrally placed social brokers.

**Robertson, Ian G. (Arizona State)**

**[63] GIS-ASSISTED ANALYSIS OF TEOTIHUACAN DATA**

Spatial, artifactual, and architectural information generated in the 1960s by René Millon's intensive survey of the prehispanic urban center of Teotihuacan have been integrated in a commercial GIS program called MapInfo. Analyses of the new data base have so far concentrated on the use of Empirical Bayesian statistical methods to refine intrasite frequency estimates of diagnostic ceramics, including Thin Orange ware, and especially where small assemblages are involved. MapInfo's graphic display methods are allowing us to make rapid, preliminary assessments of a variety of new hypotheses, with a degree of spatial resolution that has not been previously available.

**Robinson, C. (see Breternitz, C.) [7]**

**Rogers, Anne F. (Western Carolina University) and Jane L. Brown (Western Carolina University)**

**[35] RANGE AND VARIABILITY IN HISTORIC ARTIFACTS FROM THE PEACHTREE MOUND AND VILLAGE SITE (31CE1)**

Re-analysis of artifacts excavated in 1933-34 at the Peachtree Mound and Village site (31CE1) has provided new insight into the range and variability of materials recovered there. Artifacts which date from historic times include objects of both Native American and European manufacture. Among these are utilitarian, decorative, and ceremonial artifacts, extending in temporal assignment from the early Contact period through the time of Removal. This re-analysis has provided a better understanding of the role of this site in historic as well as prehistoric times.

**Rogers, J. D. (see Goodman, D.) [63]**

**Rogers, J. D. (see Nishimura, Y.) [63]**

**Rolett, Barry (Hawaii), Eric Conte (Université Française du Pacifique), and Erik Peartree (Hawaii)**

**[6] PATTERNS AND PROCESSES OF PREHISTORIC MARQUESAN VOYAGING**

Located near the limits of human dispersal into the Pacific Ocean, the Marquesas are among the most geographically isolated islands in the world. Polynesian navigators eminently skilled in long-distance voyaging settled the Marquesas ca. 2000 B.P. but voyaging canoes and traditions had nearly vanished by Captain Cook's arrival in 1774. Prehistorians infer that voyaging spheres contracted through time but lack the archaeological evidence needed to test this hypothesis. This study presents results for X-ray fluorescence analysis of lithic artifacts from recent excavations in the Marquesas, providing the first empirical data documenting processes and patterns of prehistoric interisland exchange.

**Roosevelt, Anna (Field Museum of Natural History) [Discussant 81]**

**Roosevelt, Anna (Field Museum of Natural History)**

**[59] THE RISE OF VILLAGE LIFE IN AMAZONIA**

Village life appears to have begun early along rivers. Foragers migrated in about 11,000 B.P. and left hearths, finely flaked points and scrapers, paintings, fruit pits, and rare fishbones and shells in caves. About 7,500 B.P., foragers intensified fishing and shellfishing. Their settlements have post-structures and hearths and large heaps of shells and fishbones. Among their artifacts are pottery vessels, worked bones and shells, and stone flakes. Later peoples further intensified foraging, took up cultivation, elaborated crafts, and established cemeteries, population centers, and mounds in some areas.

**Root, M. (see Abler, S.) [97]**

**Rosales-López, Alfonso (Centro Regional del Instituto Nacional de Antropología e Historia) and Harumi Fujita (Centro Regional del Instituto Nacional de Antropología e Historia)**

**[57] EVIDENCE FOR CHANGING SUBSISTENCE STRATEGIES AT ENSENADA LOS ARIPIES, BAJA CALIFORNIA SUR, MEXICO**

In 1992, investigations were carried out at the site of Ensenada Los Aripes located along La Paz Bay, Baja California Sur, Mexico. Excavation data indicate two periods of site occupation with distinct subsistence strategies. The first, 4000-2200 B.P., was oriented primarily towards the exploitation of terrestrial resources while the second, 2200 B.P.-1700 A.D., was directed mainly towards the collection of shellfish. Evidence is also presented for climatic changes over the last 18,000 years that have been inferred from an analysis of regional geomorphology. A previously unknown burial type for Baja California will also be reported.

**Rose, John R. (see Hammond, N.) [60]**

**Rosenberg, Michael (Delaware)**

**[4] HALLAN ÇEMI AND LATE 11TH MILLENNIUM SETTLED VILLAGE LIFE ALONG THE TAURUS-ZAGROS FLANKS**

Three seasons (1991-1993) of excavation at Hallan Çemi have produced a body of data pertaining to early settled village life in eastern Anatolia that is considerably at odds with prior expectations. The data suggest that fully sedentary societies, dependent on only wild resources, existed along the Upper Tigris drainage at least as early as the mid-11th millennium B.P. Moreover, the emerging picture is that these societies exhibited a remarkable degree of social complexity in the context of a cultural tradition quite independent of that which gave rise to the Levantine Neolithic cultures.

**Robb, Barbara (Tierra Services)**

**[7] SEDENTARY PERIOD HOHOKAM OCCUPATION OF NONRIVERINE ENVIRONMENTS IN THE TUCSON BASIN**

Much of what we know about the Sedentary Period Hohokam is derived from sites located along the major desert waterways. However, recent surveys and excavations in the Tucson Basin have documented a substantial Sedentary Period (Rincon phase) presence in nonriverine settings, specifically the upper bajada or mountain foothills. This paper summarizes these new data and discusses the implications of Rincon-phase occupation of nonriverine environments in terms of existing settlement-subsistence models. It is argued that these data must be considered in any discussion of the changes that occurred in the Hohokam region during the Sedentary Period.

**Robbman, Mitchell S. (Widener University)**

**[24] THE VIEW FROM THE HIGHLAND BORDER LANDS**

Our understanding of Cultural Evolution in the Middle East has been determined by developments in the optimal agricultural zones of the southern alluvium and the open steppes of Mesopotamia. However, the snow prone and agriculturally marginal high mountain zones of eastern Turkey surrounding Lake Van were borderlands to four of the great culture areas of the ancient Middle East: Mesopotamia, Central Anatolia, western Iran and Trans-Caucasia. This paper will discuss the interaction of these culture areas and, as importantly, developments in these borderlands from the 3rd to 1st millennia B.C., based on new survey data.

**Rousb, Laura**

**[8] FISH PROCESSING AT XALTOCAN: AN ETHNOARCHAEOLOGICAL STUDY**

During the twentieth century, residents of Xaltocan witnessed the desiccation of their lake. Still, many pursue livelihoods bound up with the lake. At present, roughly half the village's households acquire and process lacustrine foods, adjusting techniques handed down possibly from prehispanic times. This paper will describe the methods used recently to process fish, shrimp, frogs, algae, and aquatic insects in Xaltocan and neighboring villages, along with some local accounts of pre-drainage techniques.

**Roveland, B. (see Brennan, S.) [34]**

**Roveland, Blythe E. (Massachusetts-Amherst)**

**[34] IMAGINING PALEOLITHIC CHILDREN THROUGH FICTION**

Archaeologists have rarely made the study of children in the past a research priority. On the other hand, and not surprisingly, writers and illustrators of juvenile prehistoric fiction have included children in their visualizations of the past. This paper presents the results of a survey of juvenile fiction with paleolithic themes in which children are featured in pivotal roles. I argue that fiction, as one medium through which children "learn" about prehistory, merits serious consideration. Furthermore, fiction may provide useful lessons for archaeologists by helping us imagine and reconstruct pasts in which children as well as adults were active participants.

**Rowe, Marvin W. (Texas A&M University), Marian Hyman (Texas A&M University), Ronnie L. Reese (Texas A&M University), James N. Derr (Texas A&M University), and Scott K. Davis (Texas A&M University)**

**[103] ANCIENT DNA IN TEXAS PICTOGRAPHS**

We utilized polymerase chain reaction (PCR) and phylogenetic DNA analysis to aid in the identification of the organic binders/vehicles used in the 3000—4000 year old pictographs painted on shelter walls in Seminole Canyon, Texas. Because very little DNA is expected to remain after several millennia, and the small fraction which does survive will be seriously degraded, the ultra-sensitive method PCR is required. It amplifies DNA and can produce millions of DNA copies from only a few enduring DNA fragments. The replicated DNA can then be sequenced and information concerning the source derived. We extracted ancient DNA from two pictograph samples and subjected it to PCR.

**Rowlett, Ralph M. (Missouri-Columbia)**

**[34] EARLY LA TENE EAST MARNIAN CHILDREN**

The transmission of cultural and learned social behaviors to children occupies a key role in neo-evolutionary processes. Children therefore must be a concern in archaeological studies. Juveniles known from cemeteries and habitations of the La Tene East Marnian Group in northeast France provide interesting insight into "child culture" in an Iron Age chiefdom society. Social classes are as marked as among adults. Enculturation into adult roles can be traced in the equipment and toys supplied to children.

**Ruble, E. (see Guderjan, T.) [60]**

**Rudwick, Martin (California-San Diego) [Discussant 40]**

**Ruff, Christopher (Johns Hopkins University School of Medicine)**

**[90] SKELETAL STRUCTURE AND BEHAVIORAL PATTERNS OF PREHISTORIC GREAT BASIN POPULATIONS**

A structural analysis is carried out of prehistoric human long bones recovered from the Great Salt Lake, Stillwater Marsh and Malheur Lake regions of the Great Basin. Bone cross-sectional properties of 67 individuals were obtained through CT scanning and analyzed using engineering principles. Measures of articular size and other structural dimensions were also collected. Results are compared between regions and with samples of Amerindians from other regions and subsistence types. All three Great Basin samples group best with hunter-gatherers in terms of mobility and sexual division of labor, and show evidence of a rigorous, demanding lifestyle.

**Rubl, Donna (Florida)**

**[101] FROM APALACHEE TO GUALE: SIMILARITIES AND DIFFERENCES IN THE ARCHAEOBOTANY OF THE MISSIONS OF SPANISH FLORIDA**

Archaeobotanical assemblages generated from seventeenth century Spanish missions and associated Native American villages have revealed an admixture of Old and New World plant foods, continued use of certain "special" plants for religious and daily purposes by each group, and possibly additional native plant husbandry practices not previously validated by historic or archaeological data. Ongoing research indicates some similarities of plants utilized at Spanish Mission sites across *La Florida* but differences in quantities and overall assemblages are beginning to reveal disparities between the missions and villages of western Apalachee and the eastern provinces of Guale and Timucua. Both lean and prosperous periods/missions have been indicated temporally and topographically for the Missions of Spanish Florida.

**Ruscavage-Barz, Samantha (Washington State)**

**[80] GROUND STONE ASSEMBLAGES AS MONITORS OF CHANGING HOHOKAM SUBSISTENCE STRATEGIES: CONTINUITY AND CHANGE DURING THE TERMINAL CLASSIC PERIOD**

The Classic to Post-Classic transition in the Hohokam area appears to be marked by a decrease in agricultural intensity coupled with an increasing reliance on wild resources. This change in the subsistence regime may be represented in ground stone assemblages from Classic and Post-Classic Period sites. Certain technological and morphological characteristics of ground stone objects are indicative of the type of food

resources being processed at a given site. With this in mind, Classic Period ground stone assemblages are examined and contrasted with Pre-Classic assemblages in order to assess the correlation between ground stone technology/morphology and changing subsistence regimes during the Terminal Classic Period.

**Russell, G. (see Leonard, B.) [77]**

**Sabloff, Jeremy A. (Pittsburgh) [Discussant 93]**

**Sabloff, Jeremy A. (Pittsburgh) [Forum Participant 13]**

**Sadler, J. (see Amorosi, T.) [79]**

**Salazar, E. (see Glascock, M.) [19]**

**Salgado, S. (see Fletcher, L.) [32]**

**Samuelson, Ann (William Self Associates)**

**[76] WHO WERE THE MAYA POTTERS?**

This paper examines the characteristics of PreColumbian Maya potters through archaeological evidence and ethnographic inference. Were potters primarily female, male or both? Did individual potters join workshops, work alone or was pottery manufacture an art involving whole families? Were the characteristics and situation of a maker of crude pottery different from that of a maker of fine pottery? Did skilled potters paint their own pots? Did the dynamics of pottery manufacture change over time? These and other questions regarding the make-up of Maya potters will be looked at in this paper.

**Sanchez, Julia (California-Los Angeles)**

**[109] POCKET GOPHER DECIDUOUS TEETH: DISTINGUISHING INTRUSIVE REMAINS FROM ARCHAEOLOGICAL SITES**

Immature specimens of Pocket gopher (*Tbomomys bottae*) with deciduous teeth were identified from two prehistoric sites in southern California: Malibu (LAN-264) and an undesignated site in Long Beach (TSN 2). Gophers lose their deciduous teeth when they are three weeks old, too young to leave their burrow. These teeth are quite different from adult teeth and were unrecognizable to several experienced analysts; some were not aware that gophers had deciduous teeth. At this time, no other reports of deciduous gopher teeth are known from this area. Gophers were used prehistorically for food in this area, and their remains are not assumed to be intrusive, so these teeth have profound implications for how this faunal assemblage, as well as future analyses from this area are viewed.

**Sanchez-Garcia, L. (Centro Regional del Instituto Nacional de Antropología e Historia)**

**[57] RECONSTRUCTED GENETIC RELATIONSHIPS AMONG THE PREHISTORIC GROUPS OF THE CAPE REGION, BAJA CALIFORNIA SUR, MEXICO**

Ethnohistoric sources mention the existence of different linguistic groups inhabiting the Cape region of Baja California. There exist, however, numerous discrepancies with respect to the number of these groups and the degree of their relatedness. Multivariate analysis of osteometric data from skeletal remains recovered from recent archaeological excavations has been carried out in order to characterize the genetic distance among the prehistoric populations of the Cape region. These results and their implications for Baja prehistory are presented.

**Sanders, Donald (J. Paul Getty Trust)**

**[67] THEORETICAL AND COMPUTER-AIDED MODELING OF ANCIENT BUILT ENVIRONMENTS**

Analyses of ancient built environments using methods and theories borrowed from environmental psychology and semiotics yield unexpected and illuminating results, including insight into past behavior, in turn generating new hypotheses about the architectural evidence. When coupled with 3-D computer graphics techniques, deductions about the past become more plausible and verifiable; behavior is envisioned in a three-dimensional spatial environment, and the archaeologist experiences complete cultural landscapes more intimately than has been permitted by traditional reliance on drawings and photographs. Thus, computer-aided visualizations can alter our fundamental preconceptions about the archaeological record and its limitations.

**Sandlin, J. (see Bey, G.) [60]**

**Sandweiss, Daniel H. (Maine)**

**[65] RITUAL RODENTS: THE GUINEA PIGS OF CHINCHA, PERU**

Guinea pigs (*Cavia porcellus*) play an important role in Andean culture today as they did in the past. Not only are they highly prized as food; they also serve important functions in curing ceremonies and in other rituals. After summarizing the ethnographic and ethnohistoric data on Andean guinea pig use, I will present the guinea pigs from Lo Demás, Chíncha, a late prehispanic fishing village on the south coast of Peru. The bodies of eight intact or nearly intact guinea pigs were excavated at this site, along with numerous



disarticulated bones and dried *Cavia feces*. The context and condition of the archaeologically recovered rodent remains indicate their use as food, sacrifices, and diagnostic devices in indigenous medical practice— all of the roles these animals play today.

**Sarris, Apostolos (Hellenic Air Force)**

**[19] MAGNETIC SUSCEPTIBILITY SURVEYING IN ANCIENT MANTINEIA GREECE**

Magnetic susceptibility surveying was part of the different geophysical techniques applied in ancient Mantinea. The susceptibility "spectrum" was small for all the soil samples collected, most of which consisted of low frequency dependent SD/MD grains. The low frequency susceptibility map was similar to the map of the frequency dependent susceptibility. A trend to high values for both variables was shown at the SW end of the surveyed area, in agreement with the rest of the geophysical maps that indicated an intensive occupation at this part of the city. Heating experiments in oxygen environment confirmed the above results.

**Saul, Frank P. (Medical College of Ohio) and Julie Mather Saul (Lucas County Coroner's Office)**

**[106] THE PRECLASSIC SKELETONS FROM CUELLO**

The Maya site of Cuello, Belize, has yielded the largest Preclassic skeletal series to date. In addition to the 122 individuals we described in *Cuello, An Early Maya Community in Belize*, (edited by Norman Hammond), excavations in 1990, 1992, and 1993 have brought the total to approximately 180 individuals, with almost one-third of these dating to Early/Middle Formative. Although preservation of bones and teeth at Cuello has been recognized as "the worst ever seen, anywhere", intensive reconstruction and analysis has produced useful information on population composition, health status, cultural modifications and burial practices.

**Saul, J. (see Saul, F.) [106]**

**Saunders, Rebecca (Louisiana State)**

**[101] MODEL BEHAVIOR: EXAMPLES FROM THE MISSION PERIOD IN LA FLORIDA**

Beginning in 1968, the Florida Division of Historical Resources sponsored several inspired (but limited) testing programs of Spanish mission sites in northern Florida. The model of mission period settlement structure that emerged from those excavations has tended to be imposed rather than tested on subsequently excavated sites. Previously unreported information on the site settlement plan of the early 17th century San Martin mission in Columbia County, Florida, is particularly relevant to this point. Additional information from two later 17th century missions on Amelia Island, Florida, is also germane. Taken together, the sites indicate considerable diversity in mission period settlements in both space and time.

**Schaefer, Jerry (Brian F. Mooney Associates)**

**[86] AN UPDATE ON CERAMICS ANALYSIS IN THE COLORADO DESERT**

More than a decade of archaeological research in the Colorado Desert has transpired since Michael Waters published his Patayan buff ware ceramic sequence. These new studies provide both substantiation and revisions to his examination of Malcolm Rogers' ceramic series and regional type collections. Several new types and variants of established types are proposed, based on reported dates and geographical distributions of known types. Potential research approaches are also discussed to show how ceramics analysis can address fundamental questions of chronology, cultural affiliation, mobility, and trade in the Colorado Desert and lower Colorado River region.

**Schafer, David (Massachusetts, Amherst)**

**[8] ABOVE OR BELOW GROUND RESEARCH DESIGNS? EXAMINING THE OBSIDIAN INDUSTRY AT XALTOCAN**

Lithic data from extensive surface collections and stratigraphic test pits provide insights into some limitations and benefits of different data gathering methods. The obsidian industry of Xaltocan is examined for patterns and changes over time and through space. Lithic tool production and use are investigated and related to the larger economic and social changes that affected this community.

**Schalk, Randall (INFOTEC Research) and Clayton G. Lebow (INFOTEC Research)**

**[83] HOLOCENE LAND-USE SYSTEMS IN NORTH-CENTRAL OREGON**

Various models have been proposed to account for the prehistoric transition from mobile to semi-sedentary systems of land use on the Columbia Plateau. This paper examines the utility of those models in the light of Pipeline Expansion Project (PEP) archaeological data from north-central Oregon. The PEP corridor crosses diverse physiographic zones with high site densities and considerable variability in site type and setting. Assemblages recovered from these diverse settings are examined and implications for understanding hunter-gatherer mobility are discussed.

**Schambach, Frank (Arkansas Archeological Survey)**

**[35] A PROBABLE SPIROAN ENTREPOUT IN THE RED RIVER VALLEY IN NORTHEAST TEXAS**

There is good circumstantial evidence that the Sanders site, traditionally considered merely a "divergent" Spiro-related Caddoan site in northeast Texas, was actually an important Red River Valley entrepot operated

by long-distance traders from Spiro. These traders were probably mainly interested in exchanging Middle Mississippian prestige goods with the Caddo for powerful, locally made, bows of Osage orange or bois d'arc, which they then traded to Plains tribes for buffalo products.

**Scbele, Linda (Texas) [Discussant 55]**

**Schiff, Ann M. (California-Berkeley)**

**[11] NATIVE/RUSSIAN ENCOUNTERS AT FORT ROSS, CALIFORNIA IN (WORLD-SYSTEMS) PERSPECTIVE**

This paper examines the impact of Russian-American Company activities in the early 19th century on Native Californians in the Fort Ross region. Pre and post contact periods will be examined, focusing on exchange and continuity in settlement patterns and subsistence activities as evidenced in the archaeological and ethnohistoric record. A central-based village model will be compared and contrasted to an alternative core/periphery world-systems model.

**Schiff, Michael (Arizona) and James Skibo (Illinois State)**

**[71] A BEHAVIORAL MODEL FOR THE ORIGIN OF "STYLISTIC" VARIATION**

One of archaeology's long-standing questions concerns the causes of culture-historical distinctiveness—"style"—among artifact types having apparently identical techno-functions. Recent approaches to this problem, based on social-interaction or symbolic models, have not supplied convincing answers. In this paper, we present another model, arguing that such differences can arise as people arrive at different solutions to practical, activity-related problems in contexts of varying initial and contingent behavioral-material conditions. The maturation of this perspective has awaited the development of principles on the complex relationships between technical choices and performance characteristics now being produced by ethnoarchaeologists and, especially, experimental archaeology. The behavioral model is illustrated with the clay cooking pot.

**Schild, Romuald (Polish Academy of Sciences)**

**[45] ARCHAEOLOGY OF THE CENTRAL PART OF NORTH EUROPEAN PLAIN AND EASTERN SUB-BALTICUM BETWEEN 12,000 AND 9,000 B.P.**

In the Late Glacial and Early Holocene the North European Plain underwent several profound environmental changes that deeply affected cultural and demographic systems of the time. The most dramatic shift in the cultural system happened in the early Holocene, around 9,600-9,500 B.P. It was expressed by demographic movements, basic changes in technologies and raw material economies as well as by the shrinkage of the networks of information. A relative stabilization of the system took place at ca. 9,300 B.P.

**Schlanger, S. (see Larralde, S.) [33]**

**Schlanger, Sarah H. (Museum of New Mexico)**

**[33] FOOD PROCESSING, MEALING ROOMS, AND THE ORGANIZATION OF PREHISTORIC SOCIETY IN THE AMERICAN SOUTHWEST**

The archaeological record of the coevolution of processing technology and agriculture in the prehistoric Southwest contains well-documented trends toward more efficient tool design and increasing amounts of foodstuffs subjected to heavy processing. This paper explores the profound implications of another development at the juncture of technology and society: the construction of new rooms entirely devoted to food processing. These "mealing rooms" come into being when the traditional all-in-one house fissions into a dedicated food processing room and a "kiva" space for nonsecular activities. Their appearance marks a fundamental reorganization of workloads, workspaces, and gender relations.

**Schmader, Matthew (Open Space Division, City of Albuquerque)**

**[103] SPATIAL ANALYSIS OF ROCK ART SITES, PETROGLYPH NATIONAL MONUMENT**

Spatial analyses have been used to objectively investigate artifact or site distributions. Although rock art studies assume symbols found at sites are internally related, there have been few attempts to quantify these relationships. Standard spatial statistics (nearest neighbor; K-means) have not been satisfactory. Simple measures of spatial association used to analyze a rock art site will show: (1) some symbol types are found closer together than other symbols; (2) certain symbol categories are found closer to each other than to other types. Thus, symbols are meaningfully arranged at sites and differences within and between sites can be shown through spatial analysis.

**Schneider, J. (see Pinto, D.) [86]**

**Schneider, Joan S. (California-Riverside)**

**[33] AN ECONOMIC PERSPECTIVE ON THE ORGANIZATION OF PRODUCTION AT ABORIGINAL MILLING-IMPLEMENT QUARRY SITES**

The organization of standardized milling stone and pestle production at Antelope Hill, a large sandstone milling-implement quarry on the Gila River in southwestern Arizona, is discussed. Locations and types of

work areas reflect hill topography and accessibility of bedrock. The number of production attempts and failure and success rates are extrapolated from data gathered within sample tracts. Experimental replication allows estimates of energy and time expenditures. The great economic importance of Antelope Hill sandstone tools in Lower Colorado River subsistence systems is suggested in the ethnographic and historical literature. Thin-section petrography supports long-distance transport of Antelope Hill implements.

*Schoeninger, Margaret (Wisconsin)*

[90] DIETARY RECONSTRUCTION IN THE PREHISTORIC CARSON DESERT: STABLE CARBON AND NITROGEN ISOTOPIC ANALYSIS

Samples for stable isotope analysis were taken from thirty-nine human skeletons, seven plants, and twenty animal skeletons from this wetlands area within the Great Basin. There was no partitioning according to site, sex, or age group, but the range of isotope values (almost 6% in nitrogen and over 4% in carbon) indicates that these people ate a variety of foods. Indirect evidence suggests that people had distinctly different diets at various times throughout the occupation of the area although the general lack of temporal associations between individuals used in this study does not permit direct assessment of this possibility. The isotope data do not refute a model suggesting that people remained year round in the vicinity of the marsh. Piñon, a non local plant analyzed in this study, was probably not a very important food source.

*Schoeninger, Margaret (Wisconsin)*

[54] PALEOENVIRONMENT RECONSTRUCTION: CONSTRAINTS ON EARLY HOMINID DIETS

Stable carbon and nitrogen isotope ratios are invaluable probes for reconstructing diets but the food items available must be delineated independently. For early hominids such delineation is limited by the accuracy of paleoenvironmental reconstructions. These have been based on non-primate faunal composition often from areas separate from the hominid fossils, sediment analysis, and temperature estimates from oxygen stable isotope ratios of carbonates mainly from deep sea ocean cores. Another promising method uses the oxygen stable isotope ratios in animal bone phosphate. The advantages over other methods are that the local climate is recorded and the humidity may be estimated in addition to temperature.

*Schortman, Edward (Kenyon College) and Patricia A. Urban (Kenyon College)*

[29] THOUGHTS ON THE PERIPHERY: THE IDEOLOGICAL CONSEQUENCES OF CORE-PERIPHERY RELATIONS

The burgeoning archaeological literature on core-periphery relations focuses on trade among distinct polities and the creation of economic dependencies. Generally ignored are the ideological components of intersocietal contacts. Drawing on data from the Late Classic (A.D. 600-950) Naco valley, NW Honduras this paper addresses the question of why and under what conditions peripheral elites adopt ritual systems associated with core rulers and what affects such adoptions have on local dynamics of political competition.

*Schreiber, Katbarina J. (California-Santa Barbara)*

[36] THE EMERGENCE OF SOCIOPOLITICAL COMPLEXITY IN NASCA, PERU: SETTLEMENT PATTERN EVIDENCE

This poster session presents settlement data from the Nasca region of the south coast of Peru. Maps of settlement distributions are shown for periods beginning in the early horizon and ending with the Inca occupation. It is seen that there is little evidence of political centralization in early Nasca times (EIP 2-4). In Nasca 5 times there was a new trend toward larger sites in newly opened resource zones. In late Nasca (EIP 6-7) population aggregation and political centralization are evidenced for the first time. Finally, Nasca society was completely disrupted at about the time that the Wari Empire made its appearance.

*Schroth, Adella (California-Riverside)*

[61] ARCHAEOMETRIC DATING OF THE PINTO POINT TYPE SITES: IMPLICATIONS FOR GREAT BASIN PREHISTORY

The results of radiocarbon determinations and obsidian hydration measures for the two Great Basin Pinto point type sites, the Stahl site at Little Lake and the Pinto Basin sites, are presented. These results are then compared with other determinations throughout the Great Basin and the implications for the prehistory of the region are discussed. The use of the Pinto Basin series and the Little Lake series for placing surface sites in a chronological framework is widespread. The cumulative errors based on the assumed time frames for the occupations of these sites need to be rectified.

*Schubackel, H. (see Dent, R.) [19]*

*Schwartz, Glenn M. (Johns Hopkins University)*

[73] SPATIAL ANALYSIS OF A THIRD MILLENNIUM SYRIAN VILLAGE

The spatial/functional organization of the village of Tell al-Raqa' level 3 in northeastern Syria, ca. 2600 B.C., excavated almost in its entirety, is examined with the goal of investigating the socio-economic configuration of a small community during the development of early urban and state systems. Patterns in the distribution

of architecture, associated installations, and artifacts suggest a dichotomy of social and/or professional groups in an economically-specialized community. The analysis provides a holistic perspective of the activities of an entire community, rather than the usual view obtained from a small sample.

*Schweger, C. (see McGovern, T.) [46]*

*Scott, Barbara G. (Minnesota)*

[64] THE NORTHERN ISLES AND VIKING MIGRATION

There is a growing body of archaeological evidence for the initial Norse contact with the Northern Isles of Scotland, although the historical sources are silent on this period. Using the archaeological material in conjunction with linguistic, literary and historical evidence from the period of the medieval Norse earldom in Orkney can help us to investigate a proto-historic example of migration to and settlement in an already occupied landscape.

*Sebastian, Lynne (State Historic Preservation Division, New Mexico)*

[85] RELATIONS OF SOCIAL POWER IN CHACOAN SOCIETY

Evolutionary/typological studies of developmental change tend to be ahistorical and atemporal. They examine change along one or more organizational dimensions through cross-cultural comparisons rather than examining change through time in a single historical case. The purpose of such studies is to develop generalizations about culture change; their ability to explain change in any particular case is extremely limited because they do not take into account the historical context and material and social relationships of that case. This paper attempts to account for sociopolitical change in Chacoan society by examining the history and context of relationships of social power in the prehistoric Southwest.

*Seddon, Matthew T. (Chicago) and John Janusek (Chicago)*

[43] RECENT RESEARCH ON THE ORGANIZATION OF AGRICULTURAL PRODUCTION IN THE RIO CATARI BASIN, BOLIVIA

The organization of agricultural production in the Andean altiplano has recently become the subject of intense debate. Intensive excavation and survey was carried out in 1993 in the Rio Catari basin of the Bolivian altiplano with the goal of assessing the relationship between extensive agricultural raised fields and Tiwanaku and post-Tiwanaku societies in this region. The preliminary results of this investigation shed light on historical changes in the organization of raised field systems in the Andean altiplano.

*Seeman, Mark F. (Kent State), Larry Morris, and Garry L. Summers*

[88] REFITTING PALEOINDIAN TOOLS FROM NOBLES POND: METHODOLOGICAL LESSONS AND PROSPECTS.

Nobles Pond (33ST357) is a large, plow-disturbed early Paleoindian site in northeastern Ohio. A systematic program for refitting broken tool fragments and debitage recovered from the South Field portion of the site has resulted in over 300 successful refits. This paper will discuss comparatively the methods used in refitting, and will focus particularly on the importance of systematic evaluation of the sample, and of multiple refit trials. The results of the study as they bear on the issues of 1) tool curation, and 2) site structure will be summarized and evaluated.

*Sellet, Frederic (Southern Methodist University) and George Frison (Wyoming)*

[74] HELL GAP REVISITED

The Hell Gap site complex is one of the richest yet least known North American Paleoindian sites. Excavated in the 60's by a team from University of Wyoming and Harvard University, Hell Gap yielded a succession of Paleoindian occupations, going from Goshen to Lusk (including Folsom, Midland, Agate Basin, Hell Gap, Alberta, Cody, and Frederick), that helped establish the Paleoindian chrono-cultural sequence of the High Plains. This paper re-evaluates the cultural sequence originally described by the excavators through a close examination of the field-notes as well as through a lithic analysis.

*Semken, Jr., Holmes [Discussant 65]*

*Senior, Louise (Arizona)*

[51] BABES IN THE 'HOOD: A DISCUSSION OF INFANT AND CHILD BURIAL PRACTICES

Burials of infants and children are frequently encountered during excavations of domestic architecture. Generally, these finds are thought to be either iconoclastic or particularistic products of ancient cultures. Worldwide differential treatment of infant versus adult remains suggests that these practices are neither random nor especially particularistic. Rather, their differential patterning indicates that infants/children were not frequently accepted as full members of their communities. Near Eastern, Indian, Classical and Southwestern archaeological examples and relevant ethnographic literature on "personhood" are discussed. Archaeology may thus comment on the "Pro-Choice/Pro-Life" controversy since infant (and fetal) life has not been consistently valued until modern times.



Seymour, Deni (Marisb Associates)

[81] BOUNDING ECONOMICALLY COOPERATING GROUPS: THE ORGANIZATIONAL DEVELOPMENT OF A HOHOKAM COMMUNITY

Communities are composed of different types of economically cooperating social units. Using the prehistoric Hohokam as a case study, group boundaries are identified archaeologically on the basis of configurations of intramural space and in the spatial patterning of structures, artifacts, and features. Cooperating groups are distinguished by the types of activities performed, the size of work groups, and the types and spatial distinction of use-areas. The reconfiguration of socio-economic boundaries and the incipient development of economic inequality are visible through changes in group size and storage capacity, formalization of distinctive residential clusters, proximity to public architecture, and access to valued items.

Sbackel, Paul (Harpers Ferry National Historical Park)

[62] TRANSFORMING CRAFT TO INDUSTRY: THE MATERIAL CONSEQUENCES OF NEW SURVEILLANCE TECHNOLOGIES IN NINETEENTH-CENTURY HARPERS FERRY

The Harpers Ferry armory developed in the first decade of the nineteenth century as a craft-oriented industry. By the late 1820s new surveillance technologies were introduced that affected both factory work and domestic life in an attempt to implement a modern industrial order. Factory layout, town plan redesign, workers' housing, and everyday domestic consumer goods became more orderly, disciplined, and structured. This new industrial order and the implementation of new surveillance technologies did not go uncontested by Harpers Ferry's residents. Various forms of resistance strategies occurred at the factory and domestic levels. By the 1840s the craft-oriented society became subordinate to a system of industrial capitalism.

Sbafer, H. (see Brewington, R.) [89]

Sbafer, Harry J. (Texas A&M University) [Discussant 103]

Sbafer, Harry J. (Texas A&M University) and Robbie L. Brewington (Texas A&M University)

[87] THE PRECERAMIC LITHIC ASSEMBLAGE AT COLHA, BELIZE: OPERATION 4046

The technology and assemblage composition of the Preceramic lithic collection from Operation 4046 is presented. The lithic sample is derived from *in situ* quarrying of high quality chert. Macro cores, flakes, and blades dominate the assemblage, but some production of bifaces and unifacial implements occurred at the quarry location. Comparisons with similar artifact complexes in northern Belize suggest the Colha assemblage is part of a regional pattern tied to initial settlements of the lowlands by formative, non-pottery using peoples. Technological continuities in the lithic assemblage favor the theory that these people were the ancestors of the ceramic-using Maya.

Shaffer, Brian (North Texas) and Karen M. Gardner (Prewitt and Associates, Inc.)

[72] "KODAK MOMENTS": POTTERY MOTIFS BY THE MIMBRES PEOPLE, DEPICTING HUMAN AND ANIMAL INTERACTION

Much of the information on prehistoric animal use must be inferred from archaeological deposits. The Mimbres-Mogollon of the southwest are known for their elaborate pottery, many vessels of which depict naturalistic motifs. Examination of the more than 6000 Mimbres Archives housed at the Maxwell Museum, University of New Mexico, and other records revealed less than 60 bowls that depict humans or human artifacts, and animals together. Of these vessels, very detailed motifs of hunting (tracking, drives, netting), fishing (weirs, nets, lines), trapping, ceremonies, and domestication are depicted. These vessels represent the Mimbres' own documentation of these activities.

Sharp, Nancy (INFOTEC Research)

[83] FAUNAL EXPLOITATION AND LAND-USE PATTERNING ALONG THE PIPELINE CORRIDOR

During the Pipeline Expansion Project, faunal remains were recovered from 120 archaeological sites along a 1000-mile corridor from Canada to central California. Data recovery excavations from 1991 to 1993 yielded over 79,000 faunal specimens from 39 prehistoric sites in Idaho, Washington, Oregon, and California. These archaeological faunas show distinct geographic patterning in assemblage size and diversity, which can be related to predicted regional variation in hunter-gatherer mobility and resource selection.

Shea, John (New York-Stony Brook)

[84] HUNTING TECHNOLOGY IN THE MIDDLE PALEOLITHIC/MIDDLE STONE AGE: AN INTER-REGIONAL PERSPECTIVE

Pointed stone artifacts from the Levantine Mousterian preserve wear traces and exhibit patterned geographic variation consistent with their having been used as hafted stone spear points. Points are more common in assemblages from the arid interior and southern Levant and less common in assemblages from cooler northern Levant and coastal lowlands. Plausible stone spear points exist in African Middle Stone Age industries, but European evidence is equivocal until early Upper Paleolithic times.

Sheets, Payson (Colorado) and Monica Barnes (Cornell University)

[48] THE MAIZE CYCLE AT CEREN, EL SALVADOR

The Ceren village's sudden burial, 1400 years ago, fortuitously preserved evidence of maize from planting, through storage and processing, to consumption. Fields were ridged and drained, and multiple seeds were planted together. Maize was stored doubled-over in milpas, and in structures. Most metates were elevated on "horquetas". Maize was consumed in various ways. This paper describes the full cycle, and compares it with archaeological, ethnohistorical, and ethnographic data. Clearly maize was the staple, supplying the majority of calories and contributing to protein and fat needs, yet numerous other domesticated and wild species were cultivated or collected.

Shennan, Stephen J. (Southampton)

[99] THE EMERGENCE OF STRUCTURE IN REGIONAL ARCHAEOLOGICAL DISTRIBUTIONS

Patterning in the distributions of artefact attributes is still largely assumed to be a reflection of other underlying causal factors, such as ecological variation or social boundaries. While these may certainly be relevant in particular situations, they represent special cases of a more general phenomenon, the transmission of cultural information under the influence of the various factors which affect it. Transmission, at least in non-literate contexts, operates at the level of micro-scale inter-individual interactions which can have self-organizing properties at larger spatiotemporal scales. A cellular automaton model is used to explore these issues.

Sheppard, Peter (Auckland), Walter Richard (Otago), and Robin Parker (Auckland)

[6] LITHIC RAW MATERIAL SOURCING IN THE SOUTHERN COOK ISLANDS

Results of a program of research on the sourcing of lithic materials used to manufacture adzes in the Southern Cook Islands is presented. This includes the characterization of stone from Rarotonga, Aitutaki, Atiu, Ma'uke and Mitiaro by thin section petrography and wavelength dispersive XRF and the analysis by similar means of samples taken from the adze collection of the Cook Islands Museum in Rarotonga. The implications of these analyses in respect of prehistoric inter-island voyaging is discussed.

Shick, K. (see Jabren, H.) [25]

Sbifrin, L. (see Abler, S.) [97]

Schimada, Izumi (Harvard University) and Adriana Maguñá (Catholic University of Peru)

[15] A NEW VISION OF THE GALLINAZO CULTURE AND ITS RELATIONSHIP TO THE MOCHE CULTURE

Recent data from survey and excavation in the Lambayeque region of the Peruvian North Coast call for significant revision of long-held views of the Gallinazo culture and its relationship with the contemporaneous Moche based on data from the southern North Coast. The Lambayeque region had a significant Gallinazo occupation including various monumental constructions. It coexisted with the northern Moche polity perhaps into the fifth century A.D. Both polities appear to have been incorporated into a pan-North Coast hegemony established by the southern Moche early in the sixth century.

Shoocongdej, Rasmi (Michigan)

[93] COLONIALISM AND NATIONALISM IN SOUTHEAST ASIAN ARCHAEOLOGY VIEWED THROUGH NATIVE EYES

In Third World Archaeology today, Western Colonialism continues while Native Nationalism is becoming increasingly important. In both cases, the past is used to serve the present. This paper examines the epistemological underpinning of Colonialism and Nationalism and how these affect the nature of archaeological research. It suggests that both Colonialism and Nationalism can lead analysis and interpretation in preconceived directions and that both types of bias should be seriously evaluated. Mainland Southeast Asia provides a good illustration of the problem.

Shott, Michael (Northern Iowa) [Discussant 74]

Shott, Michael J. (Northern Iowa)

[84] CONTINUOUS VARIATION IN POINT SIZE AND FORM: EXAMPLES FROM THE AMERICAN MIDWEST

Projectile points were more than simple functional devices or markers of ethnic affinity. Their size and form were determined, to some extent, by performance requirements like range, accuracy, and delivered energy. As such requirements changed continuously, so too could the size and form of projectiles and their points. This paper interprets continuous variation in Paleo-Indian and Woodland points from the American Midwest from this perspective, suggesting that major technological transition may have occurred more gradually than often thought.

*Siegel, Peter E. (John Milner Associates)*

**[81] IDEOLOGY AND CULTURE CHANGE: A VIEW FROM THE COMMUNITY**

Amerindian settlements in lowland South America are physical models of the cosmos. Social behavior, political relationships, and activity organization are structured by how the participants interact with and interpret cosmology. Culture change in the Amazon Basin and the West Indies is rooted in increasingly asymmetrical power relationships and control over ideology. In this paper, I explore linkages between the archaeological record at the community level and ideology to discuss culture change in the West Indies. Anthropological theory, ethnohistoric documents, ethnographic observations, and archaeological data inform this analysis.

*Siegel-Causey, D. (see Corbett, D.)* [79]

*Silverman, Helaine (Illinois-Urbana)*

**[77] COMPARATIVE PERSPECTIVES ON THE EARLY INTERMEDIATE PERIOD FROM THE SOUTH COAST**

Dramatic changes occurred in the valleys of the south coast at the end of the Early Horizon, most notably in Ica, Chíncha, and Pisco with the Río Grande de Nazca lagging far behind in sociopolitical integration and economic organization. The demise of the Chavín interaction sphere created conditions for competitive political growth leading to the coalescence of the florescent Paracas-Ocucaje, Paracas-Cavernas, Paracas-Necrópolis (Topará), Nasca, and still poorly known Carmen social formations. Toward the end of the Early Intermediate Period the south coast entered and/or was forced into intensive contact with the expanding Wari state, resulting in new political strategies and cultural reconfigurations.

*Simmons, Alan (Nevada-Las Vegas)*

**[23] SURFACE FRAGMENTS, BURIED HIPPOS**

In the Old World, surface information frequently is considered inferior to excavation data. Recently, however, surveys with careful surface control have led to substantial inferences of past activities. While this trend is desirable, caution still must be used because correspondence between surface and subsurface materials may be illusory. Examples from Cyprus and Jordan show there is no guarantee that buried deposits can be predicted accurately from surface analysis; therefore, cultural or management conclusions from surface materials can be misleading. The inferential potential of surface materials must be carefully assessed and, as discussed, geoarchaeology can aid in these efforts.

*Simmons, Scott (Colorado)*

**[48] CEREMONIALISM AT THE CEREN SITE, EL SALVADOR: THE EVIDENCE FROM STRUCTURE 12**

The archaeological evidence for ceremonialism or ritual behavior is often elusive. Such is not the case at the Ceren site. This paper focuses on how artifactual and architectural information on Structure 12 indicate its status as a building with a ritualistic function. The structure contained an unusual assemblage of artifacts uncharacteristic of those found in domestic house structures. Architectural details are also indicative of the special function of the building within the community. This paper presents the evidence for this belief and explores other archaeological and ethnographic information on the relationships among structures in a community and that community's ceremonial systems.

*Simms, Steven R. (Utah State)*

**[90] FARMERS AND FORAGERS IN THE GREAT SALT LAKE WETLANDS AT THE FREMONT TO LATE PREHISTORIC TRANSITION**

A large archaeological data set, innovative artifact analyses, and the recovery/dating of human skeletal remains of 86 individuals, all from the eastern shores of the Great Salt Lake, Utah, provide context for bioarchaeological studies in this symposium. Interaction with the Northwestern Band of the Shoshoni nation led to state legislation for reburial in a vault and support for the bioarchaeological analyses. Archaeology has focused on mobility and adaptive diversity. The period from A.D. 900–1600 features a farmer-forager system of increasing adaptive diversity after A.D. 1000–1100. By A.D. 1350–1400, farming is abandoned or rare. Transgressive lake levels by the early 1600s made the locale uninhabitable.

*Simon, A. (see Burton, J.)* [42]

*Simon, Arleyn (Arizona State), John C. Ravesloot (Gila River Indian Community), and James H. Burton (Wisconsin-Madison)*

**[42] CERAMIC OFFERINGS IN SALADO BURIALS AND PREHISTORIC SOCIAL STATUS**

Archaeologists studying prehistoric southwestern burial populations have traditionally assumed that there is a correlation between the number and types of ceramic vessel accompaniments and the social standing or personal wealth of the deceased. This direct correlate is an oversimplification and subjective measure of social differentiation. Alternatively, these vessel accompaniments may represent possessions of the deceased or gifts from relatives and others with social relationships. A compositional analysis was conducted

of a ceramic assemblage from Salado cemeteries in the Tonto Basin. These results suggest that the pots and their placement reflect the social relationships of the deceased within the larger community.

*Simon, Brona G. (Massachusetts Historical Commission)* [Discussant 3]

*Simon, J. (see Dorn, R.)* [103]

*Sisk, Caleen (Wintu Tribe)* [Forum Participant 95]

*Sitney, L. (see Blinman, E.)* [19]

*Sleibo, J. (see Schiffer, M.)* [71]

*Skinner, C. (see Hughes, R.)* [83]

*Skinner, C. (see Pettigrew, R.)* [83]

*Skowronek, Russell K. (Santa Clara University)* [Discussant 101]

*Small, David B. (Lehigh University)*

**[67] PARLOR AND ASSEMBLY: PUBLIC/PRIVATE SPATIAL CHANGE AND THE DYNAMICS OF SOCIAL NEGOTIATION AT POMPEII**

The negotiation of social status within a community often integrates many contexts of social interaction, making them mutually sensitive to status seeking. A change in one context can engender proportionate changes in others. Spatial studies offer a unique opportunity to study both specific linked configurations of contexts within identified social strategies and the dynamics of change within these configurations. In Pompeii the introduction of new people changed the public negotiation of social status (new hierarchical seating in public assembly), which in turn engendered the spatial transformation of more private contexts of social negotiation within individual houses.

*Smith, Adam (Arizona)*

**[51] COMMUNICATIVE SPACES**

Present approaches to space consider it an analytical category only in so far as it hosts directed, purposeful behaviors. This paper argues that the built environment, and the spaces which it defines, communicate meanings and are thus deeply involved in ideological representations and factional negotiations over political, economic, and symbolic power. Central to this type of analysis is a consideration of circulation, architectonics and spatial production. This approach will be illustrated with a discussion of Urartian and Neo-Assyrian communicative spaces.

*Smith, Charlotte A. (ArchaeoFacts)*

**[67] PREHISPANIC ARCHITECTURE AND SOCIAL ORGANIZATION IN OAXACA**

PC-based computer mapping techniques greatly increase our ability to manipulate graphic representations of architectural features that have been recorded archaeologically. Digitized maps readily allow both inter- and intrasite comparisons and enhance our ability to combine cognitive and symbolic interpretations of architectural features with traditional structural/functional classifications. With digitized maps, classes of data can be selectively viewed and maps can be readily rescaled. Maps from a 1990 intensive survey in the mountains of Oaxaca, Mexico, show how architecture reflects aspects of social organization and settlement hierarchy. Brief comparisons are made with architectural data from other geographic areas.

*Smith, KC (Museum of Florida History)*

**[52] CAN'T JUDGE A BOOK BY ITS COVER!**

Shortly after its organization, the Formal Education Subcommittee of the SAA Public Education Committee determined that criteria were needed for the evaluation of teaching materials used in pre-collegiate archaeology education programs and activities. Subcommittee members developed a series of guidelines that can be applied to existing resource materials, or to resources in the process of being developed, to determine whether fundamental concepts of anthropology and archaeology, basic educational elements, and required curriculum components are included. The composition of these guidelines and examples of their application will be the focus of this presentation, in hopes that archaeologists and educators will derive information useful for their own attempts to select and develop teaching materials.

*Smith, Kevin P. (Buffalo Museum of Science) and John D. Holland (Buffalo Museum of Science)*

**[88] WANDERERS OF THE WETLANDS? THE LATE PLEISTOCENE OCCUPATION OF WESTERN NEW YORK**

The Niagara Frontier region of western New York and adjacent Ontario appears to be unexpectedly rich in Paleoindian sites, most of which have only been identified in the past ten years. Data obtained from recent surveys and excavations, coupled with examination of older collections, suggests that Paleoindian



occupation and processing sites in this region are strongly associated with the rapidly-shifting margins of Late Pleistocene lakes and wetlands. Patterns of Paleoindian settlement distribution, lithic resource utilization, and typology suggest a strong Early Paleoindian occupation and less evidence for a strong Late Paleoindian presence.

*Smith, L. (see Nickens, P.)* [35]

*Smith, Michael E. (State University of New York-Albany) and Cynthia Heath-Smith (State University of New York-Albany)*

[10] EXCAVATIONS OF AZTEC HOUSES AT YAUTEPEC, MORELOS, MEXICO

Seven houses plus 12 other contexts were excavated in 1993 at the Late Postclassic urban center of Yauatepec, Morelos. This paper describes the excavations and preliminary results of the project. The houses exhibit great architectural variability, from small structures to large palatial compounds. Their spatial distribution does not appear to conform to a model of discrete status districts or *barrios*. Evidence for craft production is widespread throughout the site (e.g. obsidian cores, figurine molds, spindle whorls), but we did not encounter any dense concentrations suggesting workshops. The Yauatepec data have implications for models of Aztec urbanism and socioeconomic organization.

*Smyth, Michael P. (Kentucky)*

[23] SURFACE ARCHAEOLOGY, SITE ORGANIZATION, AND SAYIL: NEW METHODS FOR STUDYING MAYA COMMUNITIES

Few studies of surface archaeology in the Maya Lowlands have been attempted. It is often argued that surface vegetation and soil deposition in lowland tropical environments prohibit the recovery of meaningful surface patterning across site landscapes. Instead, most archaeological investigations have focused on architectural remains to guide excavation strategies. Terminal Classic (A.D. 800-1000) Sayil in northern Yucatan has recently undergone an intensive site-scale systematic surface-collection. Results show that surface survey produces representative archaeological data that can reveal significant insights into the activity organization of Prehispanic Maya communities unattainable by traditional approaches emphasizing architectural mapping and excavation.

*Snarskis, Michael J. (Inter-American Institute for Cooperation on Agriculture)* [Discussant 32]

*Sobolik, Kristin D. (Maine)*

[65] DIRECT EVIDENCE FOR THE IMPORTANCE OF SMALL ANIMALS TO PREHISTORIC DIETS: A REVIEW OF COPROLITE STUDIES

Researchers tend to underestimate or ignore the importance of small animals to the prehistoric diet due to the difficulty of separating cultural from noncultural faunal debris excavated from sites. Human coprolite analyses indicate prehistoric dietary consumption of small animals. The large number of coprolites analyzed from North America reveals direct ingestion of small animals and indicates that small animal remains from sites indeed reflect human dietary patterns. The coprolites reveal that reptiles, birds, bats, and a large variety of rodents were an important and prevalent component of the prehistoric diet.

*Solimano, Paul (Larson Anthropological/Archaeological Services) and Paula G. Johnson (Larson Anthropological/Archaeological Services)*

[18] AN OVERVIEW OF THE METRO WEST POINT ARCHAEOLOGICAL PROJECT

In February, 1992 cultural deposits were discovered 15 feet below contemporary sea level at the METRO West Point Sewage Treatment Plant situated on the north side of Discovery Park in Seattle, Washington. Data recovery excavations were conducted in the area immediately to accommodate tight construction schedules. Archaeologists monitoring construction activities over the next year and one-half identified six additional areas with intact hunter-gatherer materials. Distribution patterns of archaeological deposits across the West Point landfill are summarized and approaches to construction monitoring, testing, evaluation, and data recovery are reviewed.

*Spaulding, W. Geoffrey (Dames and Moore)*

[75] TOWARD A COMPREHENSIVE UNDERSTANDING OF POSTGLACIAL ENVIRONMENTS IN THE SOUTHERN GREAT BASIN

Data accumulated as a result of paleoenvironmental investigations in southern Nevada and adjacent regions have greatly improved our understanding of postglacial environments in the area. These findings include (1) a chronology of activation and senescence of valley-bottom springs that may be regionally applicable, (2) conclusive evidence for an arid "Altitheermal," between ca. 7,000 and 5,000 B.P. and (3) physical and biotic evidence for increased precipitation during both the Neoglaciation and the Little Ice Age. Assertions that postglacial climatic change was negligible can be based only on a complacent record, or stem from a disregard of available data.

*Snead, J. (see Kolb, M.)* [81]

*Snead, James E. (California-Los Angeles and School of American Research)*

[93] "KNOW AMERICA FIRST": ARCHAEOLOGY AND IDENTITY IN THE AMERICAN SOUTHWEST DURING THE TERRITORIAL PERIOD

The development of archaeology in the American Southwest was strongly conditioned by the complex sociopolitical environment of the region after 1850. As an ambiguously defined "territory" of the United States, New Mexico in particular presented circumstances unparalleled elsewhere in the nation. These included conflicting federal policies, the intellectual colonialism of large Eastern institutions, and the interests of a small immigrant class seeking legitimacy for its position of dominance over a much larger indigenous population. This paper examines the role of archaeology and archaeologists in this nationalistic and regionalistic social climate and its importance for the history of the discipline.

*Snider, Julianne (Illinois State Museum)*

[69] CONSERVATION OF SUBFOSSIL VERTEBRATE MATERIAL IN SITU AND BEYOND MEZHIRICH DWELLING #4

Mezhirich Dwelling #4 is predominately subfossil mammoth bone and ivory partially excavated though left in situ. Subfossil bone, not being fully mineralized, is susceptible to environmentally induced stresses. Proboscidean elements examined include massive and complex, dense compact bone, porous cancellous tissue, extensive, intra-osteal sinuses, ivory, enamel, dentine, and cementum. The character and composition of the deposits combined with the conservation materials and facilities available in Ukraine led to some interesting challenges. Elements remaining semi-in situ have accumulated a patina of dirt obscuring exposed surfaces and whatever archaeological and taphonomic information those surfaces may hold. Conservation of these subfossils will allow examination of presently unexposed surfaces and provide new information.

*Snow, Elizabeth (Department of Canadian Heritage)*

[3] ARCHAEOLOGICAL RESOURCE MANAGEMENT: STRATEGIES FOR THE 21ST CENTURY

Since 1991, a new paradigm has emerged in Canada, at least at the federal level, for the protection and management of archaeological heritage. The new policy environment is requiring federal archaeological resource managers to adopt new strategies in the face of increased Aboriginal involvement, stakeholder activism, budget cutbacks, and a new legal framework emerging in Aboriginal claims legislation. Strategies for repositioning archaeological resources within a continuum of cultural and heritage considerations are discussed.

*Snow, Susan (Iowa)*

[48] CLOUDS, STARS AND CONSTRUCTED IMAGES IN THE NEW WORLD TROPICS

This paper will examine the interrelationship between meteorological and astronomical phenomena in the cosmology of cultures within the New World Tropics. Specifically, it will look at how related images and clusters of images are constructed based on these phenomena. Some of the interrelationships are based on scientific data while others are based on the symbolic interpretation of the different cultures or a combination of these ideas. The variability of the clusters of constructed images between different cultures within the New World Tropics will be summarized and discussed in light of the historical relationships between these cultures.

*Snyder, D. (see Manson, J.)* [102]

*Snyder, H. (see Lillios, K.)* [91]

*Soffer, O. (see Adovasio, J.)* [69]

*Soffer, Olga (Illinois) and N.L. Kornietz (Ukrainian Academy of Sciences)*

[69] MEZHIRICH CA. 15,000 B.P.

Mezhirich is latest Upper Paleolithic site with mammoth-bone dwellings to have been found on the East European Plain. Previous research, focused on the excavation of cultural features, showed the presence of four round or oval mammoth-bone dwellings (represented by remains of more than 149 individuals) surrounded by pits, hearths, and interior and exterior work areas. Our current work on Dwelling #4 and its environs is directed towards understanding the human use of the site, including the use or deposition types of pits. The two types of pits found at the site to date suggest the use of pits to store meat as well as for garbage dumps.

*Stafford, C. Russell (Indiana State), Ronald L. Richards (Indiana State Museum), and C. Michael Anslinger (Indiana State)*

[97] A VIEW OF MIDDLE ARCHAIC FORAGING FROM AN UPLAND BASE CAMP/CEMETERY IN SOUTHWESTERN INDIANA

Reduced mobility during the Middle Archaic (after 7000 B.P.) in the midcontinental U.S. has often been linked to an increased use of resource-rich habitats in major river valleys. The Bluegrass site, a base camp and cemetery occupied between 5300 and 5000 B.P., is in an upland lacustrine plain setting in southwestern

Indiana. Analysis of well preserved faunal remains indicates that a diverse set of terrestrial mammals and birds were exploited. Implications for Middle Archaic dietary models and foraging strategies are discussed.

Stafford, T. (see Coltrain, J.) [54]

Stanish, Charles (*Field Museum of Natural History*)

[14] THE TITICACA BASIN: LATE-INTERMEDIATE-PERIOD ORGANIZATION FROM A SETTLEMENT PERSPECTIVE

This paper will assess the impact of Tiwanaku state collapse on local Late-Intermediate-Period population in the SW Lake Titicaca Basin. Settlement data permit a definition of population changes and political restructuring in the wake of imperial collapse. I will assess models of migration, internal structural changes, and secondary state formation for the Lupapa area of southern Peru.

Stark, M. (see Heideke, J.) [42]

Stark, Miriam T. (*Arizona*)

[12] SPECIALIZED TECHNOLOGY IN SOCIAL CONTEXT: THE POTTERS' CRAFT IN A KALINGA VILLAGE

The recent emergence of specialized pottery production in the Kalinga village of Dalupa reflects a dynamic interaction between social milieu and craft technology. Pottery production for exchange is one economic solution for households faced with limited economic resources. A nexus of social, economic and political factors promote productive intensification among some Dalupa potters. This study explores a social environment which encourages potters to specialize. It also evaluates the material correlates of this system of intensified production. Product standardization is studied with respect to production scale and intensity in an ethnoarchaeological context, where both behavior and material patterning can be documented.

Standing, M. (see Ball, T.) [25]

Stein, Gil (*Northwestern University*)

[24] ETHNICITY, EXCHANGE, AND EMULATION: MESOPOTAMIAN-ANATOLIAN INTERACTION AT HACINEBI, TURKEY

Traditionally, most researchers have interpreted the presence of Uruk style material culture at Anatolian sites as evidence for the physical presence of Mesopotamian merchants or colonists in this area during the fourth millennium B.C. Excavations at the site of Hacinebi, in the Euphrates valley of southeast Turkey, allow us to examine this model of interaction between Uruk Mesopotamia and local Anatolian cultures. Spatial and temporal patterning in the Hacinebi ceramics, lithics, bone, and architecture suggest a more complex picture in which social processes such as exchange and emulation also affect the composition of the archaeological record.

Stein, Julie K. (*Washington*)

[92] SHELL MIDDEN STRATIGRAPHY: LINKING LAYERS AND DATA

Shell middens frequently have complex stratigraphy. Changes in artifacts, fauna, and lithology occur, but usually at different stratigraphic boundaries. A technique for analyzing data from stratigraphically complex sites has been developed for a Northwest Coast shell midden (British Camp 45S24, Washington). The technique uses Harris matrices to graphically display the depositional units of excavation, linked to a data spread sheet where is stored all analytical data recorded for the material from the depositional units. The pluralistic stratigraphic approach is very powerful for tracking and interpreting changes in deposition in stratigraphically complex sites.

Stebbins, Douglas (*Northern Arizona University*) and Maritba Lee (*Northern Arizona University*)

[70] VISITOR EXPERIENCES AND MOTIVATIONS AT CULTURAL SITES

A sample of visitors at three cultural parks in the southwestern U.S. were interviewed to determine what their motives were for visiting and how park attributes affected experiences being sought. Results show a diversity regarding public perceptions of cultural resources. Such variability suggest that there is a need for cultural sites to be managed with concern for a broad spectrum of visitors. We argue that such an approach would be most effective on an area wide rather than site specific scale.

Stevenson, Christopher M. (*Archaeological Services*) and Thomas L. Jackson (*Biosystems Analysis*)

[8] ESTIMATION OF HYDRATION RATES FROM CHEMICAL COMPOSITION: A CASE EXAMPLE FROM XALTOCAN, MEXICO

Recent research has demonstrated a strong relationship between the rate of hydration and hydroxyl (OH) concentration contained within the obsidian. The ability of this calibration to provide accurate calendar dates was evaluated with ten radiocarbon dated contexts from the Postclassic site of Xaltocan. Infrared

spectroscopic analysis was used to determine the OH concentration of obsidian blades identified through x-ray fluorescence analysis as originating from the Pachuca source. Results of the IR analysis documented a small but significant variation in OH concentration. The chronometric obsidian dates from ten radiocarbon dated contexts showed good agreement with the C<sup>14</sup> dates in five cases and supported the ability of current laboratory methods and calibrations to produce accurate calendar dates.

Stevenson, Joe (*Washington State*)

[9] PRELIMINARY ARCHAEOLOGICAL INVESTIGATION OF A CENTRAL AFRICAN TROPICAL FOREST CAVE: MBUYA RAPIDS CAVE, CENTRAL AFRICAN REPUBLIC

An archaeological survey conducted in the Central African Republic's tropical forest, near the Lobaye River, discovered several caves. These caves were tested for archaeological significance. One of these caves, the Mbuya Rapids Cave (Latitude North three degrees, forty-six hours, zero minutes, Longitude East seventeen degrees, fifty-one hours, nine point six minutes) provided a substantial number of artifacts, quantities of charcoal and well preserved faunal remains. These artifacts are thought to represent at least three separate periods of human occupation, including an Iron Age occupation, a ceramic/lithic occupation and a pre-ceramic/lithic occupation.

Stewart, Andrew (*Royal Ontario Museum*)

[104] EFFECT OF FOOD SHORTAGES ON SETTLEMENT PATTERNS AMONG THE CARIBOU INUIT IN THE CANADIAN ARCTIC

Among interior-dwelling Caribou Inuit during the 20th century, communal caribou hunting remained a primary focus of subsistence and settlement organization despite an increase in annual shortfalls of caribou. Evidence for smaller, more loosely organized fall aggregation sites, less reoccupation of sites, and changes in spatial association among hunting-related features suggest that regular seasonal aggregations declined in favor of smaller camps. This conclusion accords with the prediction, based on theory drawn from behavioral ecology, that independent foraging, involving greater variance in subsistence outcome, replace aggregated settlement and communal foraging in the context of annual subsistence shortfalls.

Stewart, J. (see Adams, K.) [19]

Stiner, M. (see Kubn, S.) [2]

Stiner, Mary C. (*Loyola-Chicago*) Stephen Weiner (*Weizmann Institute of Science*), Ofer Bar-Yosef (*Harvard University*), and Steven L. Kubn (*Loyola-Chicago*)

[19] DIFFERENTIAL BURNING, RECRYSTALLIZATION, AND FRAGMENTATION OF ARCHAEOLOGICAL BONE

The poster presents research on the conditions under which progressive levels of burning may occur on archaeological bone, and how burning changes bones' susceptibility to fragmentation. In experimental fires, bones buried up to 6 cm below firebeds were carbonized, but calcination occurred only with direct exposure to coals. Analysis of specimens by infrared spectroscopy reveals the changes that accompany macroscopic transformations. Recrystallization greatly affects, for example, the potential durability of fire-altered bone, especially in the calcined state. These findings have implications for the spatial associations of burned material and the archaeological visibility of some types of burning damage overall.

Stokes, Anne (*Florida*) and William F. Keegan (*Florida Museum of Natural History*)

[54] STABLE ISOTOPES VERSUS ENVIRONMENTAL ARCHAEOLOGY IN RECONSTRUCTING WEST INDIAN DIETS

This study addresses the discrepancies obtained from results of environmental archaeological studies and stable isotope studies of prehistoric human diet. Both human bone collagen, which reflects the origin of the protein in the diet, and human bone carbonate from apatite, which reflects the origin of all foods in the diet, were analyzed for individuals from several sites in the West Indies. Collagen values indicate that a majority of the protein in the diet was derived from terrestrial sources. However, the carbonate values indicate that a large proportion of the diet was obtained from a C<sub>4</sub> plant food.

Stokes, Robert (*Eastern New Mexico University*)

[36] A CRITICAL LOOK AT MIMBRES-MOGOLLON SETTLEMENT PATTERNING: THE SAPILLO VALLEY SURVEY PROJECT, 1993

This paper describes the relationship between site location and landform type in the Sapillo Valley, southwestern New Mexico. The Sapillo Valley is located adjacent to the Mimbres Valley. A generalized Mimbres-Mogollon regional settlement pattern has been established that specifies a relationship between site location and landform type. This model is based on site location data through time from the Mimbres Valley. The Sapillo data is assessed in terms of the generalized Mimbres-Mogollon settlement model. The conclusion of this assessment is that, very coarsely, the generalized model fits the Sapillo Valley survey data, although significant refinements are suggested.



Stone, Glenn (Columbia), T. J. Wilkinson (Chicago), and M. J. Mortimore (African Drylands Research)

[9] REFUSE SCATTER AND AGRICULTURAL INTENSIFICATION: AN ETHNOARCHAEOLOGICAL EXAMPLE FROM KANO, NIGERIA

A promising indicator of the location and degree of ancient agricultural intensification are artifact scatters around towns. Wilkinson proposes that urban detritus was incorporated in organic refuse brought from towns as fertilizer. This very process is described for Kano, a Nigerian city surrounded by highly intensive farming. Goat and sheep dung, collected from Kano streets along with refuse, is carried by donkey-cart to farms where it is sold. The loads are then sorted by farmers, leaving distinctive rings of urban refuse in the countryside. The density of urban refuse declines with distance from Kano.

Stone, Tammy (Colorado-Denver) [Discussant 33]

Stone, Tammy (Colorado-Denver)

[66] SHIFTS IN RESOURCE PROCUREMENT AND REGIONAL ORGANIZATION DURING THE ARCHAIC PERIOD IN THE HOGBACK VALLEY, COLORADO

The Crescent Rockshelter (5JF148) is located in the Hogback Valley, an intermontane zone west of Denver, Colorado. The site contains over two meters of deposits representing approximately 6000 years of deposition, beginning with the Late Paleoindian-Early Archaic transition. This paper will discuss the chipped stone material recovered from deep stratigraphic units with regards to changes in resource procurement strategies through time. This study will aid in understanding the changes in regional organization patterns that were precipitated by changes in mobility, subsistence patterns, and demographics in the area over the 6000 years of occupation of the site.

Storck, Peter L. (Royal Ontario Museum), P. Julig (Laurentian University, Sudbury), T. Anderson (Geological Survey of Canada, Ottawa), P. Barnett (Ontario Geological Survey, Sudbury), and W. Mahaney (York University, Toronto)

[74] IS THERE A PRE-CLOVIS COMPONENT AT THE SHEGUIANDAH SITE, ONTARIO?—NEW GEOARCHAEOLOGICAL EVIDENCE

The Sheguiandah site on Manitoulin Island, Ontario, was discovered and excavated in the early 1950s by Thomas Lee and interpreted to contain two strata of mid-Wisconsinan glacial till with incorporated artifacts representing human occupation older than 30,000 years. Recent multidisciplinary studies on the site, the first conducted since Lee's work, indicate that the alleged tills are probably re-worked beach deposits. The Pleistocene stratigraphy of the region and the elevation of the site suggest that these deposits are of postglacial age and that the earliest human occupation occurred ca. 9500 years ago by Late Paleoindian peoples.

Storey, Rebecca (Houston)

[106] CHILDREN OF PRIVILEGE AND STRESS IN LATE CLASSIC COPAN

9n-8 is a Late Classic elite compound at Copan, Honduras. The skeletal population included 122 subadults. Their age distribution of deaths has high proportions from ages 1-9. If this pattern reflects mortality rates, there should be corroborating information from paleopathological indicators. Enamel defects in the deciduous and permanent dentitions reveal that physiological stress that disturbs normal growth is very common. The ages at which stress occurred and how these relate to ages at death will be presented. The various implications of these defects for characterizing child health among the Copan elite before the Classic Maya Collapse will be discussed.

Stolbert, Karen (Trinity University)

[15] PATTERNS OF PRODUCTION AND EXCHANGE VIEWED FROM THE COLONCHE HILLS OF SOUTHWEST ECUADOR

New research in a previously unexplored region of Ecuador reveals patterns of community craft specialization and inter-regional exchange during two prehistoric periods. Interpretations are based on recent excavation in the dry tropical forest of the Colonche Hills, about 40 km inland from the coast. An early (c. 2000 B.P.) Guangala workshop for the manufacture of grindstones is described; and for the late prehistoric period (c. 1000 to 500 B.P.), large Manteño kilns for the production of domestic pottery are described.

Strand, Jennifer G. (Arizona)

[37] A PRELIMINARY STUDY OF THE POST-PLEISTOCENE DISTRIBUTION OF ABERT'S SQUIRREL IN THE SOUTHWESTERN UNITED STATES AND THE ARCHAEOLOGICAL IMPLICATIONS

Recently it has been proposed that post-Pleistocene dispersal played an important role in the modern distribution of ponderosa pine and Abert's squirrel. Archaeological site reports and collections from the northern region of Abert's distribution are examined to determine if the proposed dispersal is visible. To establish identification criteria post-cranial elements from modern Sciurids are examined, measured and the Wilcoxon test performed. Site records/collections were used to determine their presence geographically and

chronologically. The direction of environmental change indicated may have modified prehistoric subsistence choices.

Straus, Laurence (New Mexico)

[45] THE ARCHAEOLOGY OF THE PLEISTOCENE-HOLOCENE TRANSITION IN SW EUROPE

SW Europe saw great interregional differences in human responses to the environmental changes of the period between 13-8 ka B.P. In some regions major climatic, vegetative and faunistic disruptions led to abrupt, significant changes in settlement-subsistence systems. But in Iberia subsistence intensification (including both overall diversification and situational specialization, best shown in Cantabria) began early (Upper Pleniglacial and Tardiglacial) and climatic fluctuations after 16 ka B.P. were relatively attenuated (especially in E. Spain and Portugal), so that adaptive changes were gradual. In S. France general specialization in herd ungulate hunting (e.g., reindeer) and open vegetation conditions ended abruptly, with marked consequences for humans.

Stright, Melanie J. (Minerals Management Service)

[41] SYNTHESIS OF LATE WISCONSINAN RELATIVE SEA LEVEL DATA FOR NORTH AMERICA: THE CHANGING SHAPE OF THE PREHISTORIC LANDMASS

The eustatic fluctuations and isostatic adjustments caused by the building and waning of the late Wisconsinan glaciers resulted in a continual shifting of the extent of the North American landmass above sea level. Questions of prehistoric human migrations, adaptations and subsistence strategies can hardly be addressed without first considering the total extent of the prehistoric landmass. This paper includes a review of published relative sea level curves for North America for the period 13,000 B.P. to present. These curves are used to define the changing coastline of the North American landmass from 13,000 B.P. to present. The effect of this bias on the archaeological record will be discussed.

Strong, D. (see Hilton, M.) [69]

Stuart, Glen (Arizona State) and Suzanne K. Fish (Arizona)

[98] POLLEN PATTERNS AND REGIONAL SUBSISTENCE IN THE TONTO BASIN

Archaeological pollen of cultivated and wild resources exhibits strong horizontal and topographic patterning across the Tonto Basin in Central Arizona. The data set consists of more than 500 samples that are well distributed over time, space, environmental zones and site types. Geographic analysis of results at this scale represents new methodological challenges in the archaeological palynology of the Southwest. Contextual information is used to evaluate the role of environmental versus behavioral factors in basin-wide patterns, such as the concentration of many resource pollen types in valley bottom sites. Conclusions provide an economic backdrop for processes of aggregation.

Sullivan, A. (see Tolonen, A.) [23]

Summers, G. (see Seeman, M.) [88]

Sutton, Mark Q. (Colorado State-Bakersfield)

[65] RODENT UTILIZATION IN THE GREAT BASIN: ETHNOGRAPHIC AND ARCHAEOLOGICAL PERSPECTIVES

Current views of Great Basin cultural ecology are heavily influenced by the general anthropological bias on the importance of large game. As this perspective evolves through diminishing ethnocentrism and advances in archaeological methods and analyses, it is becoming clear that small animals formed a very significant aspect of the aboriginal diet in the Great Basin (and elsewhere). A review of the ethnographic and archaeological data is presented and it is argued that rodent use was important throughout the human occupation of the Great Basin.

Sweely, Tracy (Colorado)

[51] ADVERSE EFFECTS OF A TRADITIONAL ARCHAEOLOGICAL PERSPECTIVE ON PREHISTORIC CONSTRUCTIONS OF GENDER AND THE POTENTIAL FOR RESOLUTION

Archaeology developed within an historical context. Researchers using traditional categories have unintentionally biased the representations of prehistoric peoples by overstating the roles of male members while understating the roles of female members. This approach to archaeological information reflects traditional, historically constructed "ideals", and cannot be considered applicable to all prehistoric cultures. I use the case study, "The Ceren Site" by Payson D. Sheets, to demonstrate the ways this perspective affects archaeological representations of gender. To conclude, I show that the abandonment of this practice is not a problem for interpretation and can be replaced by a more balanced perspective.

Sweeney, Maria T. K. (Hawai'i-Manoa), Patty J. Conte (State of Hawaii Historic Preservation Division), and Michael J. Kolg (State of Hawaii Historic Preservation Division)

[100] ROLES AND REFLECTIONS: MONUMENTAL ARCHITECTURE AND EXPLANATORY THEORY IN HAWAII

The ongoing debate concerning the social role of monumental architecture in Hawaiian society is explored together with concurrent attempts to employ scientific or evolutionary theory in the study of ritual land-

scapes. Archaeologists have traditionally used monuments as indicators of hegemony and view them as expressions of socio-political complexity. They also represent an important link between the past and present. An environmentally based model to explain the presence and persistence of large-scale structures across the archipelago is examined using alternative histories derived from ethnohistoric sources.

*Swink, C. (see Blinman, E.)* [19]

*Szuter, Christine (Arizona)*

[65] WOMAN THE HUNTRESS

The role of women and children as hunters in the prehistoric record has been overlooked for several reasons. Hunting is often narrowly defined as the actual killing of large game. The importance and significance of hunting small game, therefore, are diminished in discussions of subsistence strategies. Hunting involves more than killing the animal. The supportive activities associated with the hunt, for example, making nets, working a drive, processing the animal, often go unnoticed. This paper presents arguments on the role of women and children in hunting small game in the prehistoric and ethnographic record.

*Taborin, Yvette (Université de Paris I) and Monique Olive (Université de Paris I)*

[16] LITHIC AND SHELL RAW MATERIAL ACQUISITION AT ETIOLLES AND COMPARISON WITH OTHER GROUPS

The lithic material acquisition system at Etiolles (Essonne, France) is marked by the near presence of abundant and exceptional flint banks. The limits of the territory visited by the Magdalenian populations at Etiolles, as well as their movements in this area, can be determined according to the fossil shells they have gathered and also the lithic tools that they have taken with them. Etiolles seems to belong to a larger network of Magdalenian period mobility in the Paris Basin.

*Tainter, Joseph (USDA Forest Service)* [Discussant 23]

*Tankersley, Kenneth (SUNY-Brockport)*

[74] 0321.0, S1—CLOVIS MASTICS: A STICKY SUBJECT

Mastics have been found on the haft element of fluted projectile points from a number of Clovis sites in Oregon, Utah, Wyoming. Chemical analysis and high-magnification microscopy have identified several compounds on these artifacts including an amber-like substance, pitch (plant resin), and iron oxide (red ochre). Similar compounds have been identified on the haft elements of Early Paleoindian stone tools and ivory objects in Eastern North America. AMS age determinations on carbon extracted from these artifacts may provide a direct means of chronometrically dating the Eastern Fluted Point Complex.

*Tapia-Recillas, Horacio (Universidad Autónoma Metropolitana-Iztapalapa) and Emily*

*McClung de Tapia (Universidad Autónoma Metropolitana de México)*

[10] NEW APPROACHES TO THE STUDY OF ENVIRONMENTAL FACTORS IN REGIONAL SETTLEMENT PATTERNS IN THE TEOTIHUACAN VALLEY, MEXICO

Ecological factors have long been a topic of interest insofar as development and decline of Teotihuacan are concerned. Many of the hypotheses formulated on the basis of intensive survey in the valley surrounding the urban center can be re-examined in the light of new data and new techniques. Soil profiles in the region are studied using GIS techniques and other mathematical approaches, together with new <sup>14</sup>C determinations in order to better understand the dynamics of geomorphological changes in relation to prehistoric human activities.

*Taube, K. (see Fedick, S.)* [5]

*Taube, Karl A. (California-Riverside)*

[5] THE MEGALITHIC STYLE OF THE NORTHERN MAYA LOWLANDS: THE MONUMENTAL ARCHITECTURE OF NARANJAL AND TRES LAGUNAS, QUINTANA ROO

This study examines the important but little studied Early Classic megalithic style of the northern lowlands. Although best known for Yucatecan sites of Ake and Izamal, this paper documents the occurrence of this megalithic style far to the east, at the sites of Naranjal and Tres Lagunas. The newly documented presence of the megalithic style in northwestern Quintana Roo not only reveals its broad distribution, but also reaffirms and amplifies its distinctive architectural traits. The many striking architectural features shared between the megalithic sites of Quintana Roo and Yucatan suggest that there was considerable interaction across the northern peninsula.

*Taylor, R.E. (California-Riverside) and Geoffrey Cunnar (Andover Foundation), and*

*Richard S. McNeish (Andover Foundation)*

[97] CRITICAL EVALUATION OF THE RADIOCARBON CHRONOLOGY AT PENDEJO CAVE, NEW MEXICO

More than 50 radiocarbon determinations on largely wood and charcoal from a stratified cave deposit at Pendejo Cave, New Mexico indicate that the age of the sediments ranges from essentially modern (350

RCY B.P.) to at least 55,000 years (greater than 55,000 RCY B.P.). A critical evaluation of the radiocarbon evidence in light of geomorphological data will be presented. Also, the results of direct radiocarbon determinations on materials with unambiguous human attribution from levels currently dated by associated charcoal/wood radiocarbon determinations in excess of 13,000 RCY B.P. will be presented.

*Terrell, John (Field Museum of Natural History)*

[79] THE POSTPONED AGENDA: ARCHAEOLOGY AND SCIENCE IN THE 21ST CENTURY

As later reported in *Science*, the Wenner-Gren Smithsonian Conference on Human Biogeography was held exactly twenty years ago in conjunction with the 1974 SAA meetings in Washington, D.C. The conference surveyed the application of modern procedures, concepts, and theoretical developments in population biology and biogeography to the archaeological and anthropological study of human populations. Subsequent reactions within anthropology against sociobiology and against science postponed the research agenda of human biogeography. The research achievements of the Field Museum's 1993-94 A.B. Lewis Expedition to the North Coast of New Guinea illustrate that it is time to "come on home" to science as a way of looking at the world.

*Thacker, Paul (Southern Methodist University)*

[16] RAW MATERIAL PROCUREMENT, LITHIC TECHNOLOGY, AND SETTLEMENT PATTERNS: APPLYING MODELS OF HUNTER-GATHERER SYSTEMS TO THE UPPER PALEOLITHIC OF PORTUGAL

Lithic economy can be fully explained only within the broader context of hunter-gatherer subsistence systems. This paper tests numerous middle-range expectations regarding mobility and lithic technology using data from Gravettian and Magdalenian periods in eastern Portuguese Estremadura. Current models of hunter-gatherer systems fail to encompass variability in these lithic assemblages. Explanations of change must account for the interrelationships of raw material selection and procurement with mobility and technology. A preliminary attempt to expand models of lithic economy and respective linking arguments is undertaken.

*Thomas, David Hurst (American Museum of Natural History)*

[101] NATIVE AMERICAN ARCHAEOLOGY AT MISSION SANTA CATALINA DE GUALE, GEORGIA

This paper discusses the latest iteration of our fifteen year-long project at Mission Santa Catalina de Guale (ca. 1566-1680), St. Catherines Island, Georgia. Using a combination of regional randomized sampling and remote sensing, archaeologists from the American Museum of Natural History discovered this site in 1981; for the next dozen years, we concentrated upon the central Hispanic mission compound, particularly the church, cemetery, kitchen, and convento. Three years ago, we launched a new program of geophysical prospection and correlative limited excavation to investigate the Guale Indian pueblo at Santa Catalina. We believe that, thoughtfully utilized, such low-impact approaches both conserve archaeological resources and permit archaeologists to explore intra-site patterning at a scale previously unavailable through conventional excavation techniques.

*Thompson, Robert G. (Minnesota-Minneapolis) and Susan C. Mulholland (Minnesota-Duluth)*

[25] OPAL PHYTOLITH ANALYSIS PROVIDES A METHOD FOR TRACING THE USE OF POTTERY VESSELS TO PREPARE CORN

Food residues recovered from prehistoric ceramics directly reflect the foods cooked in the pottery. Opal phytoliths extracted from food residues provide an assemblage reflecting the plants cooked in a pot. Using the method developed by Mulholland in a study of sediments at the Big Hidatsa site, the assemblage of phytoliths representing corn cob chaff and cob fragments incorporated into food cooked in pottery was recognized at the Shea sites (32CS101). The utility of this method of tracing corn use was confirmed on food residues from Peru, which were also shown to contain corn by carbon isotope analysis.

*Todd, Lawrence (Colorado State)*

[74] QUARRIES, COMMUNAL KILLS, AND MULTI-ANIMAL MASS MORTALITIES: INTERDISCIPLINARY STUDIES AND INTERPRETATIONS OF BISON BONEBEDS

Paleoindian archaeology in western North America has relied heavily on sites where stone tools are associated with large animal bones. For nearly 50 years, these bonebeds were interpreted as either (1) quarries for recovery of extinct animals and Paleoindian artifacts (bonebeds as quarries), or (2) fossilized instants of human behavior (bonebeds as artifacts). Recent work emphasizing an interdisciplinary/taphonomic approach demonstrates that neither perspective is appropriate for interpreting human hunting and processing activities. Multi-animal bonebeds contain a complex and diverse paleoecological data set and the human actions that have traditionally been the interpretative focus (killing, butchering, processing) are seldom the primary cause of documented archaeological patterns.



*Tolonen, Anthony (Cincinnati) and Alan Sullivan (Cincinnati)*

[23] DIVERSITY MEASURES AND SURFACE ASSEMBLAGES

Because some measures of assemblage diversity, such as evenness, are considered unreliable, richness has become increasingly popular in diversity studies. However, critics cite a strong positive correlation between type variety and sample size as evidence that richness measures are flawed, thereby affecting the validity of richness-based inferences. If true, such a situation would affect intersite comparisons of assemblage diversity that rely upon type inventories—the basis of richness calculations. Surface archaeological data from the Grand Canyon are used to evaluate these viewpoints demonstrating, in the process, that such data can contribute to the development of methodology and regional prehistory.

*Torres, J. (see Pritchard-Parker, M.)* [33]

*Totb, N. (see Jabren, H.)* [25]

*Totb, Nicholas (Indiana)*

[2] DECIPHERING THE EARLY STONE AGE: SEARCHING FOR ACTUALISTIC ROSETTA STONES

The archaeology of the Early Stone Age provides important clues pertaining to the behavioral and biological evolution of Plio-Pleistocene hominids. This paper examines various avenues of inquiry into our understanding of the Early Stone Age, including the analysis and comparison of excavated archaeological assemblages, actualistic studies (experimental archaeology, primatology, ethnoarchaeology, geoarchaeology), and palaeoneurological studies. Based upon such studies, a more realistic picture of the nature and complexity of Early Stone Age hominids is made possible, and new directions for future archaeological research are presented.

*Tourtellot, G. (see Hammond, N.)* [60]

*Towner, Ronald H. (Arizona)*

[37] BIG BEAD MESA (LA 15231) IN REGIONAL PERSPECTIVE

Big Bead Mesa (LA 15231) is one of the most significant sites in the history of Navajo archaeology. Pioneering work by Keur (1941) placed the site in temporal perspective, but her research has never been augmented by additional studies. Recent tree-ring and ceramic analyses confirm the temporal and cultural site affiliation. Additional analyses indicate that, although outside the Navajo homeland of Dinétah, Big Bead Mesa was part of a larger 18th century Navajo community of defensive habitations. Similar sites are spread throughout the Rio Puerco Valley and belie a large Navajo community unassociated with the contemporary Navajo expansion to the west.

*Triadan, Daniela (Freie Universität Berlin)*

[89] WHITE MOUNTAIN REDWARE: AN EXOTIC TRADE ITEM OR A LOCAL COMMODITY? PERSPECTIVES FROM THE GRASSHOPPER REGION, ARIZONA

White Mountain Redware, a decorated pottery ware from the southern Colorado Plateau, has been used frequently to reconstruct socio-political and socio-economic structures and to evaluate trade routes and exchange patterns in the Southwest. It becomes a prominent decorated ware in the Grasshopper Region during the aggregation phase of the 14th century. Neutron-activation analysis on a large sample of reconstructible vessels and sherds from Grasshopper Pueblo and contemporary sites of the region sheds new light on the production and circulation of White Mountain Redware in the east-central Arizona mountains during the 14th century.

*Tringbam, Ruib (California-Berkeley)*

[40] VISUAL IMAGES OF ARCHAEOLOGICAL ARCHITECTURE

The ambiguity of the archaeological record and the multiplicity of its interpretations have come under sharp and critical examination in the recent archaeological practice of the elite academic world. This paper explores the popularization of these concepts through the powerful medium of visual imagery. It focuses on computer-aided constructions, juxtapositions, and "virtual realities" of the archaeological record of prehistoric architecture in Europe.

*Truncer, James (Washington)*

[50] A MINERALOGICAL CHARACTERIZATION OF MIDDLE ATLANTIC STEATITE QUARRIES USING ENERGY DISPERSIVE SPECTROSCOPY (EDS)

Energy dispersive spectroscopy (EDS) has been used to assess the mineralogy of prehistoric steatite quarries in the Middle Atlantic region. EDS provides a fast method to identify mineralogical composition with a high degree of accuracy and precision. Mineralogical identification, when used in combination with chemical analyses, increases the likelihood that these quarries can be individually characterized and that artifacts can be attributed to them.

*Turner, C. (see Regan, M.)* [98]

*Turpin, Solveig (Texas-Austin) and H. H. Eling, Jr. (Texas-Austin)*

[105] ROCK ART AS PROPAGANDA: SPANISH AND NATIVE AMERICAN PICTOGRAPHS IN THE BOLSON DE MAPIMI, MEXICO

For three centuries after Spanish expansion into northern Mexico, the Bolson de Mapimi served as a refuge for displaced Native American groups who systematically raided the ranches and settled communities of Coahuila, Chihuahua, and their southern neighbors. After initial explorations proved the intractability of the landscape, Spanish expeditions were largely retaliatory and punitive attempts to dislodge the hostile tribesmen from their mountain hideouts. This conflict is perpetuated in native pictographs and Spanish inscriptions, both intended to advise the opposition of their presence in the region. Thus, rock art that once served as propaganda now identifies camps and routes through the desert from waterhole to waterhole.

*Tveskov, M. (see Byram, R.)* [35]

*Tyko, Robert H. (Harvard University)*

[91] NEOLITHISATION IN THE WESTERN MEDITERRANEAN ISLANDS

The islands of Sardinia, Corsica, and Sicily played a central role both geographically and economically in the neolithisation of the western Mediterranean. New chronological and other data concerning the Mesolithic settlement of Sardinia and Corsica, the early use of ceramics, the exploitation of obsidian and greenstone, and the appearance of domesticated plants and animals suggest that the neolithisation process was neither spatially nor temporally uniform and that a generic "neolithic package" derived from the Near East was not simply "adopted". A more complex explanatory model based on indigenous adaptations and developments is proposed for this important transition in Mediterranean prehistory.

*Urban, P. (see Bell, E.)* [19]

*Urban, P. (see Schortman, E.)* [29]

*Urban, Patricia (Kenyon College)*

[48] COUNTING HEADS: LATE CLASSIC DEMOGRAPHY OF THE NACO VALLEY, NW HONDURAS

Recent discussion of prehistoric demography for the Classic Maya area has highlighted a series of deranging factors which render difficult the assessment of prehistoric population size and change through time. This paper examines whether such factors—non-contemporaneity of structures assigned to phases; reuse and abandonment of structures; functional differentiation among buildings; and hidden/invisible-to-survey structures, among others—are operative in a non-Maya portion of SE Mesoamerica. Also examined are the problems produced by differences in wealth, power, and site location. Finally, estimates for Late Classic population and a discussion of its distribution are presented.

*Urcid, J. (see Bray, T.)* [19]

*Urcid, Javier (Smithsonian Institution)*

[55] MOUND J AT MONTE ALBAN AND ZAPOTEC POLITICAL GEOGRAPHY DURING PERIOD II (200 B.C.-A.D. 200).

This paper outlines the complex architectural history of Mound J at Monte Alban. These data are presented as background in order to discuss the manner in which the inscribed "conquest slabs" were originally displayed. Methodological shortcomings in previous interpretations of the epigraphy on the slabs are considered. An alternative approach to the study of Zapotec hieroglyphic place names is presented.

*Uruñuela, G. (see Plunket, P.)* [30]

*Uruñuela, Gabriela (Universidad de Las Americas), Patricia Plunkett (Universidad de Las Americas), Gilda Hernandez (Universidad de Las Americas), and Juan Albañero (Universidad de Las Americas)*

[30] BI-CONICAL GOD FIGURINES AND THE CODICES OF THE BORGIA GROUP

Archaeological explorations in Cholula, Puebla, often encounter bi-conical mold-made figurines of different deities. An analysis of a cache of this type of artifact found during rescue work on the campus of the University of the Americas suggests that these figurines provide an important link between Cholula and the codices of the Borgia Group.

*Valdes, J. (see Demarest, A.)* [76]

*Valdez, F. (see Pbol, M.)* [76]

*Valdez, F. (see Reese-Taylor, K.)* [44]

*Valdez, Jr., Fred (Texas-Austin)*

[87] THE EARLIEST MAYA IN CURRENT CONTEXT

Material remains of the "earliest Maya" are currently dated to ca. 1000 B.C. Recent investigations in Belize have shown human presence in the lowlands back to the Paleo-Indian era with evidence for a widespread

Archaic. Especially interesting is a "pre-ceramic" occupation at the site of Colha where proto-Maya developments may be in evidence. Data from Belize and surrounding areas are used to present a model for the presence and development(s) of early occupation and settled life in the Maya lowlands.

Valentin, B. (see Julien, M.) [16]

VanderHoek, R. (see Holmes, C.) [30]

van der Merwe, Nikolaas J. (Harvard University)

[54] ISOTOPIC BONE CHEMISTRY AND THE DIETS OF THE MAYA

A carbon and nitrogen isotope study of human and animal bone from Cuello, Belize provides a window on pre-Classic Maya diet and environment. Maize was an important but not overwhelming staple in the pre-Classic; the diet was varied, and included wild animal protein. Data from other Maya sites show that maize increased in dietary importance through the pre-Classic and Early Classic (presumably due to higher-yield varieties), then declined steadily to a nadir in the Terminal Classic (presumably due to population increases). During the post-Classic/Historic times, the Maya were totally dependent on maize, and the diet lacked variety.

VanPool, C. (see VanPool, T.) [70]

VanPool, Todd (New Mexico) and Christine VanPool

[70] SOLUTION PH AND OBSIDIAN HYDRATION DATING: AN EXPERIMENTAL STUDY

Obsidian hydration dating has assumed an increasingly important role in the construction of archaeological chronologies. However, several significant questions remain concerning the nature of the hydration process and factors that influence the rate of hydration. This paper reports the results of an experimental study of the effect of solution pH on obsidian hydration rates. Specifically, obsidian from Glass Buttes, Oregon, has been hydrated in solutions ranging from pH 1 to pH 11. The results of these experiments and their implications for the archaeological use of obsidian hydration dating are examined.

Van West, Carla (Statistical Research) and Jeffery H. Altschul (Statistical Research)

[98] MODELING AGRICULTURAL PRODUCTIVITY, CARRYING CAPACITY, AND CULTURAL CHANGE IN THE TONTO BASIN: A CASE STUDY APPROACH

In 1992 Statistical Research constructed a model of potential agricultural production and carrying capacity for the lower Tonto Basin using a tree-ring based reconstruction of climate. Estimates of potential maize yield and population size were produced. Recently gathered archaeological data are used to evaluate our predictions. Settlement pattern and demographic data generated from the Meddler Mound and Schoolhouse Mound studies are employed. The results are used to suggest modifications to the model, assess the modeling approach, and evaluate cultural responses to risk in the highly variable environment inferred for the Basin during the late pre-Classic and Classic periods.

Van Zandt, T. (see Orcutt, J.) [58]

Varien, M. (see Kelley, J.) [37]

Vauser, A. (see Hartley, R.) [103]

Velichko, Andrei (Mercyhurst College), J. M. Adovasto (Mercyhurst College), R. Buyce (Mercyhurst College)

[69] GEOLOGY AND GEOMORPHOLOGY AT MEZHIRICH: MACRO- AND MICRO-PERSPECTIVES

The site of Mezhirich is placed in a macro- and micro-environmental context using traditional geological methods and high-resolution geochronological techniques. The genesis, subsequent evolution, and ultimate abandonment of the Mezhirich locality is examined. The bedrock geology, Pleistocene sediment package with included paleosols, sedimentation and soil-formation mechanisms, and post-depositional site modifications are presented as an ever-changing backdrop to the human utilization of this area in the Late Pleistocene.

Verano, John W. (Smithsonian Institution) [Discussant 22]

Verbaaren, Bruce (Argonne National Laboratory)

[24] THE EFFECTS OF URBAN DECLINE ON A SMALL SETTLEMENT: A VIEW FROM THE PERIPHERY

Kurban Höyük, a site on the Euphrates in southeastern Anatolia, declined from a respectable walled town in the mid-Third Millennium to a rather scruffy village by the beginning of the Second. Third Millennium Kurban declined in size and complexity in concert with the broader settlement system of which it was part. Using a Geographic Information System as an intra-site analytical tool, this paper explores the evidence for social and economic change found in the broad exposures of the mid-Third and Second Millennium settlements at Kurban Höyük and their implications for our understanding of contemporary regional changes.

Villalpando, Maria Elisa (Instituto Nacional de Antropología e Historia)

[93] FROM PINART TO RODRIGUEZ: COLONIALIST VERSUS NATIONALIST INTERESTS IN NORTHWESTERN MEXICO

The practice of archaeology and interpretation of prehistoric events differ not only according to theoretical focus but interests within remnant native populations. Mexican archaeology has a national legislature which allows research all over the territory without consulting ethnic groups. Every one of us are "Mexicanos," therefore, there are no different rights for traditional ethnic territory. It is just ethics and social compromises with native communities which guide our endeavor. Those particularities had impact on northwestern archaeology where colonialist interests had become a locus of struggle between Mexicans and foreign archaeologists.

Vitelli, K. (see Watkins, J.) [38]

Voigt, Mary (College of William and Mary) [Discussant 4]

Voytek, Barbara (California-Berkeley)

[59] THE BALKAN NEOLITHIC: A STUDY IN SEDENTARY VILLAGE LIFE

Since the Dawn of European Civilization, the Balkan Neolithic has been viewed as the case study of village life. Questions surrounding the reasons for sedentism are matched by questions dealing with the effects. Was it irreversible? Were the Balkans really stalled in the Neolithic and there were no social and/or economic changes during those 1000 odd years? This paper examines the dynamics of sedentary neolithic village life, drawing on data from recent excavations in Yugoslavia.

Watles, Bernard (Pennsylvania) [Forum Participant 13]

Wake, Thomas A. (California-Berkeley)

[11] EFFECTS OF EUROPEAN CONTACT ON NATIVE AMERICAN FOODWAYS AT COLONY ROSS, CALIFORNIA

Vertebrate faunal remains recovered from recent archaeological excavations in Fort Ross State Historic Park, Sonoma County, California, provide important information concerning the effects of a European colonial system on a diverse native American community in an early nineteenth century Russian settlement. Historical records show that this community consisted of native Alaskans, native Californians, native Russians, and a number of mixed-race individuals. Analysis of vertebrate faunal remains recently recovered from outside the stockade at Ross shows evidence of persistence of conservative, ethnically distinct foodways, as well as the incorporation of non-traditional foods into the diet. Aspects of cultural continuity and change in the native American population of Colony Ross are discussed.

Walkenborst, R. (see Curtis, R.) [89]

Walker, D. (see Reese-Taylor, K.) [44]

Walker, Debra (Florida International University), Kathryn Reese-Taylor (Texas), and Beverly Mitchum (Pennsylvania State Archaeology)

[10] CERROS REVISITED: RESULTS OF THE 1993 EXCAVATIONS

Renewed research at Cerros, Belize began in June, 1993, in cooperation with a national tourist development program. Survey and excavation in the site core encountered new features and amplified our understanding of better known structures. Of particular interest is a well-preserved interior building, Structure 3A-2nd, which exhibited a wide staircase and some preserved facading. Also of note is a small ballcourt-like structure located near a grand staircase off the main plaza. Results of the 1993 excavations alter previous assessments of the site's development and offer new insights into the functions of Late Preclassic monumental architecture.

Walker, Phillip L. (California-Santa Barbara) and Francine Drayer (California-Santa Barbara)

[54] THE CHEMICAL COMPOSITION OF ENAMEL AS AN INDEX OF DIETARY VARIATION

Dental enamel does not remodel once it is formed. As a result, its chemical composition provides information on metabolic variation during childhood. Using an electron microprobe, we determined the distribution of Ca, P, Sr, Mg, Zn, Fe and F in archaeological and modern teeth. The composition of surface enamel was compared with that below the surface to assess the effects of diagenesis. Comparisons were also made of enamel that formed during the prenatal, pre-weaning, and post-weaning periods. The results suggest that high resolution microprobe data can provide useful information on temporal variation in diet.

Walker, W. (see Adams, E.) [85]

Wallace, H. (see Bernstein, D.) [92]

Wallace, H. (see Doelle, W.) [7]

Walsh-Anduze, M. (see Molsinger, T.) [7]



*Walsh-Anduze, Mary-Ellen (SWCA, Inc.)*

**[50] EVIDENCE FOR HOHOKAM CERAMIC PRODUCTION USING INDUCTIVELY COUPLED PLASMA SPECTROSCOPY**

A survey of potential temper sources used to produce Hohokam Red-on-buff ceramics led to the identification, recording, and sampling of numerous quarries, presumably prehistoric. Inductively coupled plasma spectroscopy was used to characterize the source material and a sample of sherds. Separate proveniences for two sources were established, and results of statistical analyses led to the inference that the pottery was produced from a single production locus.

*Walter, R. (see Sheppard, P.)* [6]

*Wandsnider, LuAnn (Nebraska-Lincoln)*

**[23] LANDSCAPE ARCHITECTURE AND THE CHARACTER OF SURFACE ARCHAEOLOGICAL DEPOSITS: INSIGHTS FROM A CONTEMPORARY INDIAN PASTORAL LANDSCAPE**

Landscape elements with different qualities attract human visitations of varying amounts and kinds. Archaeologists have profitably analyzed landscape deposits according to landscape element qualities such as landform, distance to ecotone, distance to water, and so forth. Recent study of an intensively used landscape in southern India points to other qualities of the landscape—especially its physical architecture (size and shape of “habitable” space)—and how they influence recurrent construction of site facilities and, hence, archaeological structure. Archaeological landscapes from the American West are analyzed according to landscape element architecture, demonstrating further the high information potential of surface archaeological deposits.

*Warner, Mark S. (Virginia)*

**[62] FOOD, FISHING, AND THE MARKETPLACE: AFRICAN-AMERICAN RESPONSES TO MASS CONSUMER SOCIETY**

The regimentation of individual lives has been an increasingly all-pervasive process since the eighteenth century. Due to technological limitations, however, food-production industries did not become standardized in the manner that other consumer goods such as bottles and ceramics did until the second half of the nineteenth century. This paper explores the reactions of an African-American household to the rise of a commercial food industry. Faunal remains from the Maynard-Burgess household, in Annapolis, Maryland, illustrate one family's responses to an increasingly homogenous and anonymous industry, reflecting incorporation as well as resistance to a mass consumer society.

*Warren, Claude N. (Nevada-Las Vegas)*

**[75] ARTIODACTYLS TO TORTOISES: FOUR THOUSAND YEARS OF CHANGING SUBSISTENCE AT ATLATL ROCK**

Atlatl-Rockshelter and two nearby sites in the Valley of Fire, Nevada, contain a record of ca. 4000 years occupation. This paper describes the changes in the faunal remains and technology of these sites, reviews pertinent paleoclimatic evidence for the region, and discusses correlations of changes in faunal remains and technology.

*Warren, D. (see Havill, L.)* [106]

*Warren, Diane (Indiana)*

**[35] CUTMARKS SUGGEST MORTUARY DEFLESHING AT BALDHILL SITE (32-BA-1), AN EARLY CERAMIC PERIOD MOUND GROUP IN NORTH DAKOTA**

Cutmarks are present on a minimum of ten of sixteen individuals whose disarticulated remains were recovered from the Baldhill Mound B ossuary. Location of the cutmarks corresponds closely with muscle attachment areas, suggesting remains were defleshed prior to interment. This interpretation is supported by ethnographic analogy and by the presence of red ochre paint on bone surfaces covered in life by soft tissue. SEM appearance of the cutmarks is discussed.

*Waters, Michael (Statistical Research)*

**[98] GEOARCHAEOLOGICAL INVESTIGATIONS IN THE TONTO BASIN, ARIZONA**

Geoarchaeological investigations in the Tonto Basin, Arizona indicate that during the time of the Salado occupation the landscape consisted of a number of stable Pleistocene surfaces, two late Holocene terraces, and an actively aggrading floodplain. Canal irrigation was practiced on the lowest Holocene terrace which stood two meters above the streambed. Paleohydrological reconstructions indicate that ample water was available for successful irrigation, however the amount of arable land was limited. The small amount of arable land may have been the environmental factor that limited population growth and contributed to the decline of the Salado.

*Watkins, Joe (Bureau of Indian Affairs), Lynne Goldstein (Wisconsin-Milwaukee), Karen D. Vitelli (Indiana University), and Leigh Jenkins (Hopi Tribe)*

**[38] RESPONSIBILITIES OF ARCHAEOLOGISTS TO NON-ARCHAEOLOGICAL INTEREST GROUPS**

At the Workshop on Ethics in Archaeology held in Reno, Nevada, in November of 1993, a series of “Principles” were developed to help guide archaeologists and archaeology into the next century. One of the key ethical principles in archaeology must focus on the nature of responsible archaeological research. Responsible archaeological research must include public accountability and a commitment to work with affected groups ranging from Native Americans and other groups with biological or cultural affinity to the people studied by archaeology to local communities near sites of archaeological interest. The paper discusses the key terms and concepts within the principle, and includes a series of case studies and examples relevant to each.

*Watson, Patty Jo (Washington University)* [Discussant 40]

*Wattenmaker, Patricia (Virginia)*

**[24] URBANISM IN UPPER MESOPOTAMIA: PERSPECTIVES FROM SOUTHEASTERN TURKEY**

Third Millennium B.C. cities of southeast Turkey provide an opportunity to study origins in the dry-farming zone of Mesopotamia. Traditionally, ancient settlements in southeast Turkey have been viewed as smaller and less complex than those in other regions of upper Mesopotamia. Moreover, state and urban formation in this area has been attributed to interaction with more complex societies to the south. However, recent research at Kazane Höyük reveals that urbanism in the region followed a distinct long-term indigenous process of development, and was on a scale similar to that documented elsewhere in north Mesopotamia.

*Waybomas, C. (see Butler, V.)* [97]

*Webb, S. David (Florida Museum of Natural History)*

**[41] LATE PLEISTOCENE ENVIRONMENTS IN THE MIDDLE AUCILLA RIVER**

Paleoindian artifacts abound in submerged sites along west peninsular Florida. In the Aucilla River we have excavated sedimentary sequences of late Pleistocene to early Holocene age which range from coarse clastics to marls, peats, and muds. They produce not only lithics and bones, but also shells, wood, pollen, and other plant remains. Some peats represent mastodon digesta containing steroids and epithelial cells.

*Weber, Andrzej (University of Alberta)*

**[94] THE NEOLITHIC OF THE LAKE BAIKAL AND ANGARA RIVER REGION: A REVIEW OF PAST AND PRESENT RESEARCH ADVANCES**

The rich settlement and burial evidence available from the Baikal/Angara region in Central Siberia provides one of the most promising opportunities to study Holocene foragers within the entire boreal forest. The Neolithic prehistory of the region is best known to western scholars through only a few English translations of A.P. Okladnikov's works and a few transcripts of his model by Western archaeologists (e.g., H.N. Michael and C. Chard). This model, not unanimously accepted in Siberian archaeology, was recently challenged by C-14 dating, stratigraphic, and craniometric evidence exposing a need for a new archaeological study of the Lake Baikal Neolithic with the aid of a new approach and modern analytical techniques.

*Weiner, S. (see Stiner, M.)* [19]

*Weisler, Marshall I. (Historic Preservation Office, Marshall Islands)*

**[6] LONG-DISTANCE INTERACTION IN PREHISTORIC POLYNESIA**

The identification of exotic pottery and obsidian has played key roles in defining prehistoric long-distance interaction networks in Melanesia. The limited occurrence of these commodities in the eastern Pacific has hindered our ability in documenting external contacts between islands within Polynesia. The recent application of geo-chemical techniques to Oceanic island basalt artifacts has greatly improved the ability to examine external communication of previously thought isolated island societies. This paper explores the methodological and theoretical advances made in Polynesian interaction studies.

*Weiss, P. (see Guderjan, T.)* [60]

*Welch, J. (see Prentiss, W.)* [105]

*Wells, C. (see Williams, J.)* [52]

*Wells, Peter S. (Minnesota)*

**[64] GERMANIC MIGRATIONS AND CELTIC RESPONSES**

Ancient writers recorded migrations from northern Europe into central and southern regions by peoples they called Cimbri and Teutoni, in and after 113 B.C. Material effects of these migrations have been difficult to identify, and their impact has been unclear. New evidence pertaining to the establishment of large fortified settlements in the Celtic regions of central Europe suggests a scenario of abrupt change in which the

migrations can be viewed as a decisive factor in major cultural change in the final phase of European prehistory.

*Whalen, M. (see Minnis, P.)* [7]

*Whalen, Norman (Southwest Texas State)*

[9] PLEISTOCENE SITES IN SOUTHERN YEMEN

A survey in south Yemen in the fall months of 1992 resulted in the discovery of 37 Paleolithic sites, most of them multicomponent. The sites were located on escarpments emanating from high mountains and paralleling major wadis coursing south toward the Gulf of Aden. They were all surface sites and yielded 2,159 artifacts. Sixteen contained artifacts resembling the Developed Oldowan and 27 had typical Acheulean assemblages. Both industries appeared together on ten sites but differed in various attributes. These sites agree with others in suggesting an early occupation and settlement of the Arabian peninsula.

*Wheat, Patricia (Crow Canyon Archaeological Center) and Joan Few (Houston-Clear Lake)*

[52] IN THE CLASSROOM: A SURVEY OF TEACHERS IN TEXAS

Workshops about archaeology—including archaeological methods, cultural sequence and stewardship—have been offered to Texas teachers. These sessions range from about 1½ hours to 30 hours in length, with activities inside and outside the classroom. A recent survey of teachers who have attended these workshops asked, among other things: What message did the teacher hear? How does the “trained” teacher relate archaeological stewardship to his/her students? Are sites being vandalized by naive teachers? Do teachers want more information or other resources? The results of the survey will be used to design workshop sessions and develop new materials.

*White, Christine (Western Ontario)*

[106] DIETARY DENTAL PATHOLOGY AT LAMANAI

Previous stable isotope and trace element analysis of human bone from Lamanai, Belize has demonstrated significant dietary shifts occurring in association with cultural change from the Preclassic period to early Colonial times (1250 B.C.-1670 A.D.). The human dentition can also provide a reliable means of reconstructing food consumption in ancient populations. The favorable preservation of teeth makes them a particularly important source of information for the tropical lowland Maya whose bones have been subject to the high levels of degradation. In this study, an analysis of dental pathology on the entire Lamanai sample (N=122) is done to complement the earlier chemical study.

*White, G. (see Fredrickson, D.)* [11]

*White, R. (see Pike-Tay, A.)* [30]

*White, Randall (New York University)* [Discussant 16]

*White, William G. (Bureau of Reclamation)*

[75] 26CK4695—A DAM WORKER'S CAMP OR PROSPECTOR'S CAMP?

The Hoover Dam landscape is covered with historic archaeological sites associated with the construction of Hoover Dam, Clark County, Nevada. Local oral history contends that a recently identified site, 26CK4695, is a campsite associated with job-seekers waiting to be hired as construction laborers during the early 1930s. Artifact and archival evidence, however, suggests that this multi-component site is associated with localized mineral prospecting activities and claim development prior to the construction of the dam.

*Whitley, D. (see Dorn, R.)* [103]

*Whitley, David S. (California-Los Angeles)*

[103] ORIGINS OF GREAT BASIN NUMIC POLITICAL DIFFERENTIATION

An old debate concerns the origin of Numic band headmanship. Julian Steward, using the Numic as the foundation for his cultural-evolutionary model, argued headmanship was a reaction to Euro-American contact. Omer Stewart countered that it had prehistoric roots. Most now view the ethnographic evidence as equivocal. To resolve this impasse, I re-analyzed Numic social relations, and examined site survey and rock art data from the Coso Range, California. This suggests that political differentiation appeared circa 1000 B.P., evidenced by changes in: subsistence; logistical organization of the settlement pattern; and rock art iconography and production rates.

*Whitridge, Peter (Arizona State)*

[105] THE RISE AND FALL OF A WINTER VILLAGE: QUANTIFYING THULE SITE STRUCTURE

Recent investigations at PaJs-2, in the Central Canadian Arctic, have documented an unusually large Classic Thule occupation consisting of at least 57 winter houses. Interpretation of the village's social and economic organization hinges on the notoriously difficult task of accurately assessing stability or change in settlement size over time. An analysis of formal house attributes reveals robust patterning in the spatial distribution of

heuristic house “types” across the site. The implications of these results for modelling the organization and growth of this and other Thule winter villages are discussed.

*Whittington, Stephen (Maine) and David M. Reed (Pennsylvania State)*

[106] “LET THEM EAT CAKE”: LOW-STATUS MAYA DIET AT COPAN, HONDURAS

The bones of low-status Maya who died during the Classic Period at Copan contain both direct and indirect indicators of diet. Based on statistical analysis of the complex patterns reflected in dental diseases, porotic hyperostosis, enamel hypoplasia, periosteal reactions, stable carbon and nitrogen isotope ratios in collagen and demography, we suggest that the low-status residents of Copan were poorly nourished around the time of the polity's demographic collapse. Illnesses and diminished work capacity related to diet appear to have been involved in the collapse, which began in the ninth century.

*Whittlesey, S. (see Ciolek-Torrello, R.)* [7]

*Wicker, Nancy (Mankato State)*

[64] MIGRATION OR ITINERANCY: MIGRATION PERIOD SCANDINAVIAN TYPE BRACTEATES FOUND OUTSIDE SCANDINAVIA

The Migration Period, named for European population movements during the fifth and sixth centuries A.D., seems apropos for a session on migration. Similarities in material culture have been explained as a result of diffusion of skills, trade of objects, or even migration of peoples. This paper focuses on Scandinavian bracteates to demonstrate two kinds of migrations: long-distance movements of populations and travels of specific segments of populations such as craft workers and traders. Understanding the nature of contacts that produced archaeologically recognizable connections between objects and peoples illuminates the relationship between material culture and ethnicity.

*Widmer, Randolph J. (Houston)*

[92] THEORETICAL IMPLICATIONS OF COASTAL ARCHAEOLOGY

Archaeological studies in various coastal regions of the world have resulted in a broadening of our understanding of human adaptation, the effect of environmental change on settlement and subsistence strategies, and sociopolitical development. The theoretical implications of these works cannot be directly paralleled in studies of terrestrial regions. It is argued that the study of coastal regions can bear important independent lines of evidence for understanding cultural adaptation and cultural change. A series of theoretical problems, relevant to archaeology in general, will be presented, and the role in which using coastal regions as databases for addressing these general problems will be discussed.

*Wilk, Richard (Indiana University)* [Discussant 38]

*Wilkinson, T. (see Stone, G.)* [9]

*Wilkinson, Tony J. (Chicago)*

[24] SETTLEMENT AND URBANIZATION IN SOUTHEAST ANATOLIA DURING THE BRONZE AGE: A REGIONAL PERSPECTIVE

Results of recent surveys conducted in southeast Anatolia will be used to demonstrate how urban settlements became nucleated from smaller more dispersed communities during the mid-third millennium B.C. Emphasis will be placed upon how much growth was related to change in land use and agricultural production, and how, with increased urbanization, settlement systems became more integrated into larger economic entities. This which process did not occur in isolation and urbanization in southeast Anatolia will be placed within the context of urban growth that characterized the entire rain-fed farming belt of upper Mesopotamia.

*William, J. (see Abler, S.)* [97]

*Williams, Joyce A. (Southern Illinois University-Edwardsville) and Christy L. Wells (Southern Illinois University-Edwardsville)*

[52] WHAT WORKS AND DOESN'T WORK: AN EVALUATION OF A PRE-COLLEGE TEACHER EDUCATIONAL FIELD SCHOOL

The Contract Archaeology Program at Southern Illinois University at Edwardsville has conducted an Educational Field School at the World Heritage Cahokia Site for two summers. The Field School focuses on teaching teachers about archaeological preservation through development of classroom lessons based on hands-on activities such as creating archaeological sites. Changes in the original program were ongoing based on participant feedback through surveys. In other words, what worked and what didn't!

*Williams, Robert (Old Catholic Church in Texas) and Tim Albright (Texas-Austin)*

[55] THE CLASSIFICATION & EXTENSION OF LINEAGE IN THE MIXTEC CODICES FROM POSTCLASSIC TIMES TO CA. 1565 A.D.

This paper will present the Mixtec scribal classification of four ancient lineages and trace the temporal and geographic extension of one of them from its origination in Postclassic times at one locality and its



extension to yet another location and its survival there until after the Conquest. These data will be collated from three Mixtec Codices: Zouche-Nuttall, Side One, Vindobonensis Mexicanus I and Selden.

*Willig, J. (see Horne, M.)* [83]

*Willig, Judith A. (INFOTEC Research)*

[83] HOLOCENE CLIMATIC CHANGE AND HUMAN OCCUPATION: THE RECORD FROM WESTERN PALEOSOLS

Large numbers of Pipeline Expansion Project sites have produced a broad spectrum of stratigraphic sequences and paleosols associated with human occupation. The complex sequence of 35-JE-49 in north-central Oregon is the most complete, with occupation episodes (including 25 hearth/pit/midden features) from 11 major strata/paleosols dating from 9980 ± 355 B.P. Pre-Mazama paleosols represent five cycles of wetter, colder, early Holocene periods, corresponding to similar mesic episodes documented in the regional climatic record. At southeastern Washington's 45-WW-100, a paleosol developed in bedded, fluvio-glacial flood sediments immediately below Glacier Peak ash dates 12,160 B.P., indicating a major soil formation hiatus between flood episodes.

*Wilshusen, Richard (Crow Canyon Archaeological Center)*

[89] A COMPARISON OF TWO PREHISTORIC ABANDONMENTS OF THE SAME REGION

The Mesa Verde region of the American Southwest has at least two major prehistoric abandonments—one late in the ninth century A.D. (Pueblo I) and another in the thirteenth century A.D. (Pueblo III). Prior to both of these abandonments, settlement in the Mesa Verde region is characterized by high population levels with population concentrated in villages of 100 to 600 rooms. In both periods abandonment is rapid and regional in scale. Recent syntheses of data for all known Pueblo I and Pueblo III villages are used to compare settlement patterns, economic risks, and behavioral responses for the two abandonments.

*Wing, E. (see Reitz, E.)* [65]

*Winslow, Diane Lynne (Desert Research Institute) and Susan R. Edwards (Desert Research Institute)*

[37] CORDAGE AND CERAMICS FROM PAHUTE MESA: EXAMINING PREHISTORIC TECHNOLOGY IN THE SOUTHERN GREAT BASIN

Recent research at Pahute Mesa on the Nevada Test Site has produced new knowledge about prehistoric cordage and ceramic technology. Cordage fragments, a rarity in the southern Great Basin, were discovered during the excavation of a small rockshelter. Also, brownware ceramics from within the shelter and adjacent occupation areas, have revealed vessel forms previously unknown for this region. This poster will summarize and illustrate these recent discoveries.

*Winter, M. (see Peeler, D.)* [55]

*Winzler, Susan (California-RiverSide)*

[5] WATER RESOURCES AND ANCIENT MAYA WELLS OF NORTHERN QUINTANA ROO

Water resources are recognized as a major factor in the pattern of settlement within the northern Maya lowlands. The Holbox Fracture Zone of Quintana Roo represents a water-rich environment within the generally arid northern lowlands. Investigations at the site of Naranjal and the surrounding local area revealed numerous ancient wells which apparently provided for domestic water needs. The distribution and characteristics of these wells are discussed in relation to the local terrain and settlement pattern. The potential regional significance of hand-excavated wells is explored through the use of computer modeling of water-table accessibility in the northern lowlands.

*Wise, Alicia L. (North Carolina)*

[13] INTRODUCTION TO DARE TO DOMINATE A DOMINEERING DISSERTATION

*Wise, Karen (Natural History Museum of Los Angeles County)*

[22] CHINCHORRO MORTUARY PRACTICES AND SETTLEMENT IN SOUTH COASTAL PERU

Ongoing research in the Ilo region of Peru demonstrates the presence of Chinchorro tradition extended burials in haphazardly laid out cemeteries at sites dating to the Middle to Late Archaic Period. These sites contain domestic and midden areas as well as cemeteries, and appear to represent sedentary or semi-sedentary coastal villages near sources of fresh water. It is suggested that Chinchorro mortuary practices represent ritual aspects of territorial behavior of small groups tied to certain choice locations with access to both marine resources and fresh water along the desert coast of the south-central Andes.

*Wobst, H. (see Brennan, S.)* [34]

*Wobst, H. Martin (Massachusetts-Amherst)*

[96] ANTI-PARADIGMATIC TYPOLOGY, OR THE REPRESSION OF VARIATION IN ARCHAEOLOGY

Regardless of paradigm, archaeological typology and classification have proceeded as if they did not matter. When it comes to typology and classification, modernist and post-modern archaeologists tend to

contradict their most basic assumptions. Much of the variation which they want to account for gets inadvertently classified away. The paper illustrates that, in ethnographic contexts, typologies and classifications are highly variable, multi-dimensional, multi-logical, contradictory, and contested. We need the archaeological record to increase our appreciation of typological and classificatory dynamics and to broaden our ethnographically limited knowledge of this important arena for human action.

*Woodward, M. (see Bruchez, M.)* [10]

*Woody, Alanab J. (Nevada-Reno)*

[19] ROCK ART AND THE SOCIAL ORDER: EXAMPLES FROM THE GREAT BASIN

Rock art is an important part of the archaeological record. Aspects of the social order that can add to our understanding of the interactions of prehistoric peoples and their environment may be contained in these motifs. Hypotheses have been presented that describe both the structure and the function of this art as relating to hunting magic. This poster will present data from diverse sites in the northern Great Basin, which confirm this hypothesis. Additional data will also be presented, however, that suggest a relationship to other activities associated with gathering pursuits, fertility rites, puberty rites and other aspects of female behavior.

*Woollett, J. (see Amorosi, T.)* [79]

*Wright, E. (see Clark, J.)* [6]

*Wright, Henry (Michigan)* [Discussant 79]

*Wright, Katherine I. (University of London)*

[33] GROUND STONE ASSEMBLAGE VARIATIONS AND THE ORIGINS OF AGRICULTURE IN THE NEAR EAST

The role of ground stone technology in the origins of agriculture in the Near East is reviewed. Data were collected from 22 Jordanian sites dating to 22,000 to 5,500 B.P. The sites include hunter-gatherer campsites, farming villages, and herding camps. The significance of ground stone assemblages is investigated using ethnographic and experimental data on plant-food processing. The transition to agriculture may have had consequences for women. Mesopotamian texts indicate that grain milling is associated with adult women in household economies. Analysis of grave goods suggests that this pattern may not have existed before the development of agriculture.

*Wright, Lori (Chicago)*

[106] ANCIENT DIET AND SOCIAL EVOLUTION IN THE PASION MAYA LOWLANDS: INSIGHT FROM BONE CHEMISTRY

Stable isotopic and trace element data are presented for 5 sites in the Pasion river region: Altar de Sacrificios, Seibal, Dos Pilas, Aguateca and Itzan. Ancient diet was largely similar across the region, but individual sites show distinct chronological and social patterning. Together with stability in skeletal indicators of health stress, chronological trends in maize and animal protein consumption do not conform with the expectations of an ecological model for the collapse of this region. Instead, changes in the nature of inter- and intra-site diversity in dietary partitioning suggest that social factors may have been involved in this transition.

*Wright, Rita P. (New York University)*

[12] TECHNOLOGY AND DIFFUSION: PROBLEMS ENCOUNTERED BY AN AMERICAN NEAR PARIS

The apparent failure of Euro-Disney at a site near Paris raises questions about the neutral nature of technology and diffusion that are relevant in archaeological contexts. This paper reframes current discourses on technology and diffusion by refocusing on them as integrated phenomena and reframing assumptions about them. The main thrust of the argument is that by returning to a methodology in which diffusion and technology are viewed as interdependent and by extending their definitions beyond current narrow limits, their importance as social activities will be better understood.

*Wurst, LouAnn (Syracuse University)*

[93] COLONIZING OURSELVES: THE LAST FRONTIER?

Archaeologists are aware that colonialism has impacted the way we study the pasts of conquered peoples. However, we rarely recognize that colonialism extends further than the "other" to influence our own historic past. This paper will examine the effects of colonialism on the practice of historic archaeology in the United States by confronting the assumptions, expectations, and explanatory models we use for interpreting the behavior of diverse groups and peoples. American historical archaeology seldom challenges common misconceptions such as the "vanished" Native Americans, the "melting-pot" of immigrant groups, and traditional or "primitive" behavior ascribed to Afro-Americans.

*Wylie, A. (see Lynott, M.)* [38]

Yates, R. (see Mitchell, P.) [45]

Yellow Kidney, Buster (Blackfeet Tribe) [Forum Participant 95]

Yener, Asliban (Smithsonian Institution)

[24] METALLURGICAL INNOVATION AND TRANSFORMATION IN HIGHLAND ANATOLIA (4500-3000 B.C.): A VIEW FROM THE FRONTIER

The metallurgical transformation of the Chalcolithic is part of the wider phenomenon occurring throughout the highland resource areas of Anatolia. A basic trinket technology for fabricating metal ornaments changes in this region to one for the manufacture of functionally and technologically superior tools and weapons. A whole range of metallurgical techniques, metals, and skills appear in close proximity to mining areas and quantities of metal finds are greatly increased. These changes coincide with the socio-political transformation evident in the Ubaid and subsequent Uruk periods in Mesopotamia.

Yerkes, R. (see Kardullas, P.) [73]

Yesner, David (Alaska)

[56] ENVIRONMENTAL CHANGE AND SUBSISTENCE DIVERSITY IN THE LATE PLEISTOCENE/EARLY HOLOCENE OF ALASKA

The earliest occupation of Alaska occurred during the "Birch Period," dating from 14,000 to 9,000 B.P., when rapid environmental changes, leading to a post-glacial thermal maximum, radically transformed the landscape. The clearest patterns of occupation are seen in basins north of the Alaska Range, where loess deposits have sealed occupations in well-defined paleosols dating to 11,800 B.P. To date, well-preserved faunal remains are known only from the central Tanana Valley, where they suggest a wide subsistence diversity, including large and small game, birds, and fish. Maritime adaptations are exclusively Holocene in date, and begin ca. 9,000 B.P., as in arcas to the south.

Yoffee, Norman (Michigan) [Discussant 99]

Young, Bailey K. (Assumption College)

[64] MIGRATIONS AND INVASIONS? OR HOSTILE TAKEOVERS AND RESTRUCTURING? THE FALL OF ROME REVISITED

Did the Roman Empire in the West actually "fall" during the Fifth Century to migrating barbarian invaders? This notion, derived from contemporary written sources, underlay the archaeology of this period in France until recently. A re-examination of the evidence concerning the three major groups to "invade" Gaul and establish "successor states" there suggests that "restructuring" offers a better metaphor for a long and complex process, with episodes comparable to hostile takeovers in the corporate world.

Young, D. Craig, Jr. (Nevada-Reno)

[36] LOCATIONAL MODELS: SETTLEMENT PATTERN CHANGE IN WARNER VALLEY, OREGON

Warner Valley, Oregon, provides a case study for modelling prehistoric adaptation to the varied resource mosaics of the northern Great Basin. A locational model based on local geomorphology and resource productivity may clarify our understanding of the variation visible in the archaeological record. A model of settlement patterns has been developed using fluctuations in recent lake levels and marsh productivity. Landsat images and aerial photos are used to show landform response to climatic variation. This poster shows model development and results of initial testing against the local record. An understanding of possible settlement regimes, and their expression in the archaeological record, may provide a better understanding of levels of sedentism in the Great Basin.

Zedeno, M. Nieves (Arizona)

[42] A RETURN TO THE GIFT: PREHISTORIC RECIPROCITY IN THE NORTHERN SOUTHWEST

The study of circulation of goods is crucial for understanding economic, social, and political relationships among neolithic-level societies; unfortunately, archaeological research has been largely limited to the reconstruction of long-distance trade of exotic or scarce commodities. At present, increasing access to sophisticated methods of physico-chemical characterization opens new possibilities for investing the circulation of goods at a fine scale. This paper uses ceramic data from east-central Arizona to explore social and ritual aspects of reciprocity and discusses the archaeological correlates of reciprocal exchange among prehistoric communities of the northern Southwest.

Zeidler, James (Illinois-Urbana/Champaign)

[59] POPULATION DYNAMICS AND DOMESTIC LABOR ORGANIZATION IN THE EARLY SEDENTARY VILLAGE: A VIEW FROM REAL ALTO (ECUADOR)

This paper examines emergent social complexity in the Early Formative Period of coastal Ecuador by focusing on habitation space and paleodemography at the Valdivia site of Real Alto. Between Phases 1 and 3 (ca. 3500-2500 B.C.), changes in village size, configuration, and domestic architecture correlate with

changes in population structure inferred from life table analysis. Archaeological evidence from both data sets indicates a strong trend toward increasing social differentiation, household size variability, and status inequality. The implications of these trends are explored with regard to models of household competition, domestic labor control, and the rise of "big-man" leadership.

Zeller, Anne C. (Waterloo)

[34] PRIMATE CHILDREN AS MODELS FOR ARCHAEOLOGICAL INVESTIGATIONS

Anthropologists study Primates as models to help understand early hominid social behavior and ecological adaptations. Most field research has been focused on the requirements and contributions of adult group members to the virtual exclusion of young, except in their roles as a focus of mate selection or social buffering. Specifically considering the needs of primate "children" alters projections of ecological parameters such as food procurement patterns, home range size, and adult tasks. The nature and scope of changes in accepted models of social organization and energy budgets when the requirements of young are considered could provide useful parallels when studying populations archaeologically.

Zhao, Zbijun (Missouri-Columbia) and Deborah M. Pearsall (Missouri-Columbia)

[25] USING MULTIVARIATE ANALYSIS TECHNIQUES TO SEARCH FOR DIAGNOSTIC PHYTOLITHS

Phytoliths are silica bodies produced in plant cells. In some taxa, phytoliths are highly variable in their characters. Recognizing the patterns of variability of diagnostic phytolith types is the key for identifying plant taxa from archaeological soil samples. In this paper, we explore multivariate approaches to study phytolith shape and size for developing species-level diagnostics. We use *Oryza* and *Setaria* as our examples, and illustrate how species-level diagnostics can be identified using discriminant analysis and other multivariate analysis techniques.

Zier, Christian J. (Centennial Archaeology, Inc.)

[66] HOLOCENE ADAPTATIONS AS EXHIBITED IN ROCK SHELTERS ALONG THE PLAINS—FOOTHILLS TRANSITION ZONE, SOUTHERN COLORADO

Seven rock shelters on Fort Carson Military Reservation provide a stratigraphic record of human occupation during the period 5700-770 B.P. Paleoclimatic data suggest rather subtle environmental variation during this span, with conditions never profoundly different from those at present. A stable hunter-gatherer economy oriented principally toward consumption of small mammals and *Chenopodium* is evident. Maize appears in the stratigraphic record around 2750 B.P. but in small quantities, with little obvious effect on the overall subsistence system. Lithic materials analysis suggests use of, or contact with, plains areas further east as well as high mountains to the west.

Zimmerman, Larry (South Dakota) [Discussant 38]

Zimmerman, Larry (South Dakota) and Leonard Bruguiere (South Dakota and Inbanktonwan Sioux Tribe)

[93] USURPING NATIVE AMERICAN VOICE

The use of "voice" is not often a matter of conscious choice for scholars. Archaeologists erroneously assume that they have the authority to speak for the human beings under archaeological investigation and that they have some understanding accessible only through archaeological reconstruction. Because archaeology is purported to be the only way that information about the past can be obtained, the archaeologist claims the voice of those studied and asks others to yield to that authority. For many Native Americans, archaeological usurpation of Native American voice must be challenged because to allow it threatens the power of the living cultural tradition to know the past. Application of "ethnocriticism" may allow legitimate archaeological use of Native American voice.

Zubrow, Ezra (SUNY-Buffalo and National Center for Geographic Information Analysis)

[96] ASSOCIATION, SPATIAL VARIATION, SPATIAL TAXONOMY AND GIS IN ARCHAEOLOGY

Underlying a considerable amount of analysis in archaeology is the concept of association, which suggests "like is near like" both spatially and temporally. On this premise various archaeological taxonomies are traditionally defined: the "horizon—phase" taxonomy, the "activity area—site—culture" taxonomy, and the "hamlet—village—town—city" taxonomy, to name a few. This paper considers the appropriateness of such theoretical and methodological concepts, and uses spatial semi-variance and spatial autocorrelation to illustrate their strengths and weaknesses. Examples use GIS for analytic and presentation purposes.

Zukosky, William (Dames & Moore, Inc.)

[37] ARCHAEOLOGY OF THE EASTERN GREAT BASIN: THE KERN RIVER GAS TRANSMISSION LINE PROJECT

The Kern River Gas Transmission Line project under the direction of Dames and Moore mitigated 140 prehistoric and historic cultural properties in the eastern Great Basin, western Utah. Site types consist of residential bases, short-term logistic or foraging camps, diurnal task sites, and extractive locations. Research



domains include chronology, paleoenvironments, lithic procurement and technology, subsistence and settlement patterns, and site structure and activity reconstruction. With the use of these research domains we seek to explain variation in human behavior throughout the eastern Great Basin from the perspective of evolutionary ecology.

*Zurita-Noguera, J. (see McClung de Tapia, E.) [8]*

*Zurita-Noguera, Judith (Instituto de Investigaciones Antropológicas UNAM) and Emily McClung de Tapia (Universidad Nacional Autónoma de México)*

[25] IDENTIFICATION OF CARBONIZED AND MINERALIZED AGAVE FIBER REMAINS FROM TERREMOTE-TLALTENCO, TEOTIHUACAN AND TLATTELCO

There is substantial information concerning the uses of Mexican *Agave* fibers to manufacture fabrics, sandals, cordage, rope, etc. Most of the archaeological remains of fibers are poorly preserved and, especially if carbonized or mineralized, do not respond to traditional laboratory treatments. The study of phytolith extractions of modern specimens revealed silicified structures that can be considered diagnostic of *Agave* fibers. Application of phytolith analysis was carried out with specimens from Terremote-Tlaltenco, Teotihuacan and Tlatelco. It was possible to identify which specimens were *Agave* fibers and to determine which corresponded to other plant families on the basis of diagnostic phytoliths.

*Zutter, C. (see McGovern, T.) [46]*