

SOCIETY FOR AMERICAN ARCHAEOLOGY



ABSTRACTS
of the
58th Annual Meeting

April 14–18, 1993
Adam's Mark Hotel—St. Louis, Missouri

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Cover: Bird Man Tablet, Cahokia Site, American Bottom, Illinois.

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SOCIETY FOR AMERICAN ARCHAEOLOGY Fifty-Eighth Annual Meeting

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ABSTRACTS OF SYMPOSIA

[0] THE CROSS-IN-CIRCLE: QUARTERING CAHOKIA'S CONTACTS

Many misconceptions have resulted in the last two decades regarding Cahokia and its relationship to other societies. Within the last three years two major publications (Stoltman, and Emerson and Lewis) have produced the evidence necessary for understanding Cahokia's contact and interaction with its external world. A symbolic embodiment of this "world" is evident in the cross-in-circle motif, often found in Mississippian contexts. This symposium will attempt to provide a perspective on the relationships Cahokia maintained with its different quarters in terms of the timing, location, intensity, and roles of the various prehistoric participants.

[1] THE BANDELIER ARCHAEOLOGICAL PROJECT: COLONIZATION, AGGREGATION AND ABANDONMENT ON THE PREHISTORIC PAJARITO PLATEAU, NEW MEXICO

The Pajarito Plateau of North-central New Mexico was colonized by agriculturists in about A.D. 1150. Substantial villages appeared ca. A.D. 1275; much of the plateau was abandoned around 1500. We describe and attempt to explain these processes from the perspective of a long-term survey and excavation project within Bandelier National Monument. Special attention is paid to examining and revising a model for aggregation in which subsistence intensification, driven by increasing population, forces increased agricultural specialization and provides selective advantages for larger villages in dealing with agricultural risk, and in defending claims to choice agricultural land.

[2] ARCHAEOLOGICAL RESEARCH THROUGH VOLUNTEERISM: THE PASSPORT IN TIME EXPERIENCE

Most archaeological work in the USDA Forest Service has been confined to NHPA 106 and 110 compliance activities with minimal public involvement. Four years ago, the Forest Service developed "PassPort in Time" as part of the evolving "Windows on the Past" Initiative. The intent was to involve the recreating public with heritage research/conservation activities as an option for complying with the 1988 ARPA "Public education" amendment. This symposium will sample a variety of projects conducted with the help of "PIT" volunteers. These projects will demonstrate that recreating volunteers and archaeologists can be partners in fulfilling archaeological objectives.

[3] VANISHING SPACES: NATIVE AMERICAN SACRED PLACES

Enhanced conservation of Native American sacred places is of increasing concern to many North Americans. With the passage of legislation and directives in the U.S. and Canada, archaeologists have been drawn into debate over preservation of Native American sacred and traditional lands. Archaeologists, in general, have not been prepared for this debate, and there is no consensus on this issue. This symposium provides for consideration of sacred lands issues through examination of case studies from the western U.S. and Canada. Additionally, Native and non-Native presenters and discussants will address general concerns about sacred sites from the various perspectives represented.

[4] STUDIES OF SUBSISTENCE AND SETTLEMENTS DURING THE JOMON PERIOD (10,000—300 B.C.) IN JAPAN

The prehistoric hunters-gatherers-fishers of the Jomon Period are among the best known examples of non-agriculturalists who maintained "complex" socio-cultural systems. This symposium brings together American, Canadian, and Japanese researchers working on the subsistence practices and settlement systems during the Jomon period. It will present a variety of methodologies, techniques, and perspectives, as well as the considerable temporal and geographical variability in the Jomon subsistence-settlement systems.

[5] INTERPRETING THE EVIDENCE FOR INTENSIVE AGRICULTURAL TECHNOLOGIES IN THE MAYA LOWLANDS

This Symposium addresses some questions which plague archaeologists, and others, concerning the relationship between raw data and the interpretation of these data with reference to intensive agricultural technologies. Participant papers cover a variety of technologies and locales in the Maya Lowlands. It is hoped that a focus on the bases of interpretation will help to clarify and perhaps resolve differences in a field important to the understanding of ancient Maya economies. Due to the number of researchers participating, papers will be restricted to 15 minutes in length.

[7] ETHNOARCHAEOLOGY AND SITE STRUCTURE: THE ORGANIZATION OF DOMESTIC SPACE

The analysis of site structure has been the focus of much recent archaeological investigation. All too often, interpretations of site structure are founded on patterns of artifact/ecofact distributions

revealed through mathematically based pattern identification procedures. Such procedures do not explain how these observable patterns came into being. Ethnoarchaeology is a powerful approach for understanding the human behavioral dynamics that created patterns in the spatial distribution of archaeological materials. This symposium interweaves ethnoarchaeological studies of hunter-gatherers, pastoralists and agricultural societies with archaeological case studies that together present a diversity of approaches for interpreting material patterning.

[8] PALEONUTRITION: SELECTED PAPERS ON THE DIET AND HEALTH OF PREHISTORIC AMERICANS

Rapid recent advances in paleonutrition research threaten to fragment this already diverse field into a variety of vital, but disjoint subdisciplines. Yet archaeological inference relies heavily on such evidence. This symposium presents recent research that has focussed on defining paleonutrition as a discipline and how researchers have used such studies in advancing our knowledge of the diet, health, and nutrition of prehistoric Americans. The research provides examples of how integrative work is necessary to determine paleonutrition, and the problems inherent in such analyses.

[9] THE CENTRALITY OF BIOARCHAEOLOGY: ANDEAN INSTANCES

We present Andean case studies that illustrate the centrality of bioarchaeology. Ecologically framed studies of adaptation are validated by investigation of paleodemography and skeletal and dental indicators of diet and stress. Example studies present hypotheses concerning trade, tribute, pilgrimage, warfare, and the limits of contemporaneous occupations. Analyses of the skeleto-muscular system substantiate posited differences in activities and diet between sexes, time periods, and social classes or ethnic groups. To ignore bioarchaeological interpretation would be to imperil the intellectual promise of archaeological study. Andean studies present a model to be followed.

[16] COMPARING CAPITALS

The great capitals of pre-Columbian America seem to be literally mind-boggling to many archaeologists. Both Tiwanaku and Cahokia, for example, have been described respectively as "pilgrimage shrine" and "low-level chiefdom," as if their stupendous dominance could not be seen. To amend such bias, we compare a series of American capitals in the light of recent research, both empirical and interpretive. The concept of "capital" involves questions of identifying polities, their probable political economies, trade systems, and ideologies - and the fundamental question of what constitutes warranted inference in archaeology.

[17] RECENT INVESTIGATIONS ALONG THE UPPER MAIN BRANCH OF THE SUSQUEHANNA RIVER BASIN

Archaeological investigations sponsored by the Pennsylvania Department of Transportation have contributed a substantial amount of new data along the upper Main Branch of the Susquehanna River basin. Archaeologists from Louis Berger and Associates and from Archaeological and Historical Consultants Inc. are involved in all phases of this work. This symposium provides the vehicle for the presentation of this research which spans the Early Archaic through the Late Woodland. Contributions include new insights into the use and procurement of lithic materials, a much clearer understanding of the depositional history along this section of the river, and new data on subsistence and settlement.

[18] THE PRE-CLOVIS PROOF FROM PENDEJO CAVE, OROGRANDE, NEW MEXICO

This careful excavation of the beautifully stratified, well-dated zones of Pendejo Cave, Near Orogande, New Mexico, has yielded considerable evidence of Pre-Clovis (pre 12,000 BP) paleo-indians. Further, 40 or more radio-carbon determinations from 20 sequential strata from 12,900 to more than 38,100 years (maybe 50,000 BP) indicate these remains are well before Clovis times. The evidence for this besides crude tools (often made from lithics foreign to cave) are manmade hearths, bones worked by man, human hair, human palm and fingerprints, as well as non-random concentrations of ecofacts and artifacts. The participants of the symposium shall give details of each of the above-mentioned proofs and will be available to discuss such with one and all.

[19] RECENT CONTRIBUTIONS TO THE ARCHAEOLOGY OF NORTHERN NORTH AMERICA

Over the enormous area of the American arctic and subarctic recent archaeological and palaeoecological research has changed our conceptions of the earliest penetrations of the hemisphere, of the forms of native culture that developed, and of the first European contacts. The papers here discuss these matters from Alaska in the west across the expanse of the Canadian North to the Eastern Maritime region.

[20] ANDEAN-AMAZON LINKAGES IN PREHISTORY

While the importance of ties between coastal and highland populations has long been recognized, connections to peoples and resources east of the Andes have often been downplayed or ignored. Archaeological and ethnobotanical evidence indicates a long history of contact between the sierra and the eastern lowlands, yet the significance of this relationship to the cultural trajectories of societies in both regions has rarely been discussed. This symposium provides a forum for discussion of recent archaeological and ethnohistoric investigations into the nature of highland-lowland interaction. The data presented offer new insights into the historical significance of the relationship between these two zones.

[21] THE FOUNDATIONS OF SOCIAL INEQUALITY

Diverse perspectives and information on the beginnings and nature of social inequality in past human society are presented in a forum designed to encourage discussion, the evaluation of differing viewpoints, and the exchange of ideas. This focus is intended to investigate the role of social differentiation in traditional archaeological debates and major societal transitions. A variety of theoretical perspectives and specific case studies from the Old and New World, from the origins of agriculture to complex states, are included.

[22] NEW DEVELOPMENT IN CENTRAL MISSISSIPPI VALLEY ARCHAEOLOGY

The central Mississippi valley has been the scene of much recent research, particularly on Mississippian materials. As a result, radically new views of the history of settlement, subsistence, and organization are beginning to emerge for this important area. This symposium attempts to synthesize these new data and the emerging understandings from the Late Archaic onward.

[23] TAKE ME TO YOUR LEADER: ARCHAEOLOGISTS AND CONSULTATION WITH NATIVE AMERICAN AND OTHER TRADITIONAL COMMUNITIES

Recent changes in federal and state laws and regulations have led to an exponential increase in the need for consultations with Native American and other traditional communities about identification and protection of historic properties, disposition of human burials removed from areas impacted by development, and other issues. Because these new consultations are additions to the existing CRM structure, archaeologists in state and federal agencies and in private practice are often the only anthropologists available to meet these requirements. In this symposium, archaeologists and Native Americans discuss the issues and challenges of this expanding consultation process.

[25] WHAT MEANS THIS ART?—LATE PLEISTOCENE “CREATIVE EXPLOSION” IN THE OLD WORLD

This symposium brings together archaeologists from Africa, Australia, Europe, and North America to debate the comparative issues about “why art?” in certain prehistoric and ethno-historical situations of hunter-gatherers. Although inspired by the recent trend to recognize the differential patterns of the appearance and development of image-making among many late Pleistocene peoples - there is no one ‘Paleolithic Art’. The symposium will address the more general questions of why some peoples engage with and elaborate material culture and art making, and what is the archaeological evidence for the reasons and contexts in which this happens.

[32] ARCHAEOLOGICAL SURVEY AND AERIAL PHOTOGRAPHY IN THE UNITED KINGDOM

The Royal Commission on the Historical Monuments of England has been the national body of survey and record since 1908. Its function is to create and promote a National Monuments Record, now a computerized database, for use in planning survey work, understanding archaeological landscapes, and providing information to national and local bodies for conservation purposes.

The symposium will be addressing the approaches, methodologies and processes that are involved in surveying, recording and preserving archaeological sites and monuments in England.

The proposal for this symposium arose from discussions with the SAA's Professional Relations Committee and it is hoped that it will provide a link between the professional, historic and academic interests on both sides of the Atlantic.

[33] THE NATURE OF MISSISSIPPIAN TOWNS AND CENTRAL PLACES

Much has been written about the spatial patterning of Mississippian towns and the polities that built them. Much less is known about these towns as communities. Our purpose is to describe and interpret the functional characteristics of Mississippian towns and central places; in other words, to identify the basic rules of a functional grammar of these places.

[34] EXPLAINING LONG-TERM CHANGES IN POSTGLACIAL FORAGING TECHNOLOGIES: OLD AND NEW WORLD PERSPECTIVES

This symposium will present a series of papers on current perspectives for explaining long-term changes in Postglacial foraging technology. Participants will discuss the general explanations or

specific hypotheses which are being used to elucidate this process, the archaeological implications of these arguments, and the specific nature of technological change. Discussions will focus on the Mesolithic of Western Europe, and the Paleoindian/Archaic of North America. In doing so, they will provide a review of how Old and New World archaeologists are dealing with these difficult issues.

[40] RECENT RESEARCH ON THE PREHISTORY OF THE DELAWARE VALLEY

This symposium highlights recent research into the prehistory of the Delaware Valley. A wide variety of themes are represented by the 12 papers to be presented: 1) bedrock geology and raw material catchments; 2) regional geomorphology and landform use; 3) faunal resource exploitation and subsistence strategies; 4) site locational parameters; 5) in-depth site specific studies based on recent excavations; 6) functional analyses of lithic artifacts related to specific cultural groups; and 7) a view of recent archaeological work in the Delaware Valley as seen by a private funding agency. Taken as a whole, these presentations provide a balanced assessment of current research in a major prehistoric occupation zone of the northeastern United States.

[41] THE CURRENT STATUS OF RESEARCH IN THE AMERICAN SOUTHWEST

As in many other regions in the Americas, the last several decades have witnessed an explosion in research in the Southwestern US and adjacent areas. The aim of this symposium is to take stock of the "state of the art" of major topical and regional issues. This serves both to make the results of this work more readily available to those specializing in other geographic areas, and to provide an opportunity for workers within the region to consider the directions in which future research should proceed.

[42] TRACKING POLITICAL CHANGE AND SOCIAL STRATIFICATION AT CAHOKIA

Theoretical developments in conjunction with an expanded data base are enabling researchers to plot the short-term political changes at Cahokia as related to longer-term processes of social stratification and hierarchization. Participants' measures of community-organizational change, population centralization, social differentiation, and material-goods mobilization and distribution provide a composite picture of the mechanisms whereby the rulers of Cahokia maintained regional political cohesion and interregional prominence. This symposium both defines new parameters for viewing the scale and configuration of Cahokia's relations with other midcontinental groups and advances our perceptions of chiefdoms, Mississippianism, and Native-American civilization.

[43] GEOARCHEOLOGICAL METHODOLOGIES FOR INTERPRETING PREHISTORIC LANDSCAPES

New or innovative geoarchaeological methodologies and approaches to interpret paleolandscapes, processes, and environments, or to locate, identify and distinguish cultural deposits have been developed and tested over the last several years. These methodologies and approaches are designed to more selectively and efficiently deal with an array of archaeological problems, particularly within the realm of CRM. Experience suggests the broad archaeological public, representing large geographic regions, are either unaware of these methodologies or have not seen their usefulness demonstrated. Participants (geologists, archaeologists, geographers) in this interdisciplinary symposium will present examples of these methodologies, discuss results and identify future prospects.

[44] TOWARD SENSITIVE INTERPRETATION OF CULTURAL RESOURCES IN A MULTICULTURAL SOCIETY

Presentations address topics on sensitive interpretation that effectively communicate the actual experiences and perspectives of defined ethnic/cultural groups relating to archeological, ethnographic, and historical materials and subjects. Presentations represent experiences relating to a diversity of ethnic or minority groups, including blacks, Hispanics, American Indians, and others. A major goal of the session is to identify common denominators associated with the problems and challenges of developing ethnically sensitive public interpretation programs in multicultural societies. Consistent with past policy, NPS plans to publish the results of the session.

[45] INTERPRETING SMALL TO MEDIUM-SIZED ARCHAEOFAUNAL REMAINS

Many archaeological sites contain a large number of bones from animals that weigh less than 22,000 grams (coyote-sized or smaller). This symposium presents recent taphonomic research on raptors, leporids, rodents, small carnivores, reptiles, and fish. This research is designed to shed light on the prehistoric human exploitation of small to medium-sized animals, and to discuss the role that nonhuman agents play in depositing these bones in archaeological sites.

[46] AFTER THE LAND BRIDGE: CLIMATE, BIOMES, AND CULTURAL INTERACTION IN NORTHEASTERN BERINGIA

This symposium examines the current state of inquiries, and honors the contributions of Edwin S. Hall, Jr. to the anthropology of northern Alaska. In accord with the breadth of Professor Hall's

own interests, the contributions range in scope from the earliest cultures of the region to the ethnographic record of the recent past. The papers include accounts of the initial human occupations of northern Alaska, the interaction of environmental and cultural change, arctic site formation processes, questions regarding obsidian and chert procurement, utilization and trade, and contact period interactions of native peoples with themselves and with Euroamericans.

[47] ARCHAEOLOGICAL CERAMIC INVESTIGATIONS IN MID-CONTINENTAL NORTH AMERICA

Recent ceramic investigations in midcontinental North America encompass a range of technical approaches matched in few other world regions. While investigations of paste composition are yielding surprising new information about group interaction, engineering studies are providing baseline data for assessing the performance of different ceramic fabrics. At the same time, existing typological frameworks are being questioned and new theoretical perspectives on ceramic change are being proposed. These investigations have set the stage for major advances in the study of Woodland and Mississippian pottery.

[48] "CHULLPA" BURIAL HOUSES AND "AYLLU" ORGANIZATION IN THE ANDES

Andean social organization was based on the "ayllu," a kin-based group focused on an *apical* ancestor—a mummy who was venerated in rituals that periodically restructured the power of ancestors and descendants relative to one another. To the extent that the ancestral mummy embodied the "ayllu," and its entitlements, appropriate tomb accommodations were a prerequisite for "ayllu" organization. This symposium examines formal variation in tombs and their probable relations to "ayllu" organization, as well as temporal/spatial distribution tombs appropriate for "ayllu" ancestors.

[49] NEW PERSPECTIVES ON THE GULF COAST OF MESOAMERICA

Exciting new discoveries and interpretations have emerged concerning the Gulf Coast of Mesoamerica during recent years. New research has affected our views about the Olmecs in the Preclassic period, Classic period societies and their relations to Teotihuacan, changing social and political organization along the Gulf Coast, and alterations of land use under Spanish rule. These studies include both household and regional scale investigations. The symposium is an effort to introduce some of the key new findings and relate new information to established understandings of ancient Mesoamerica.

[55] LATE QUATERNARY PALEOENVIRONMENTS AND HUMAN SUBSISTENCE IN THE CENTRAL MISSISSIPPI RIVER VALLEY

The Central Mississippi River Valley (CMRV) has served as an important source of natural resources for human populations since the late Pleistocene. However, the distributions and abundances of these resources have fluctuated through time in response to dynamic changes in late Quaternary environments. To understand the evolution to establish baseline data on biotic resources and landscapes which formed the environments humans inhabited and exploited. To this end, participants in this interdisciplinary symposium synthesize available data on the response of landscapes and biotic communities to paleoenvironmental changes. Attention is focused on the potential causes of differences in the paleoenvironmental signals derived from the various proxies. This information is integrated with analyses of human subsistence strategies.

[56] THE ETHNOARCHAEOLOGY OF SETTLEMENT PATTERN: PASTORAL SOCIETIES

Ethnoarchaeological studies are a powerful middle range research tactic for linking the archaeological record with land use strategies of the past. In this symposium, ethnoarchaeological approaches are used to investigate pastoral organization at the intersite or settlement pattern scale. Contemporary ecological, social and ideological factors are used to relate the spatial distribution of material remains with pastoral land use strategies of the past. Theoretical discussions on the issue of scale and the use of ecological variables are complimented by approaches focusing on mobility, occupational intensity, the variable effect of ecological context, location, and place.

[57] ANCESTORS, AGRICULTURE, AND THE ARCHAEOLOGY OF PLACE AT K'AXOB, BELIZE

The K'axob Project is a multi-faceted research endeavor in which the genesis of ancestor veneration in the Maya lowlands is investigated in its agrarian, Formative context. This site provides a case study of the poorly documented agrarian, kin-organized component of Maya society. K'axob exhibits an occupational history of pronounced continuity over two millennia. Research papers presented in this symposium focus on this continuity of place by addressing the following topics: the significance of ancestral interments within residences; the age, sex, nutritional status and genetic affiliations of these interments; the ritual sanctification of Formative burial locales through dedicatory caches with explicit iconographic content; transformation of the physical, agrarian environment around K'axob;

changes and continuities in the local acquisition of clay for vessel construction, and the assertion of community identity through the customization of generalized canons of ceramic form and decoration.

[58] ARCHAEOLOGY AND PREHISTORY OF WESTERN NORTH AMERICA

The papers of this symposium address problems of cultural evolution, adaptation and change in the ecologically and culturally diverse areas of western North America. The affluent hunter-gathers of the Northwest coast and California contrast with the collectors and marginal agriculturalists of the Great Basin, and Colorado deserts. The scale of the problems addressed range from the evolution of cultural systems to shifting subsistence strategies to recent approaches and discoveries in regional prehistory.

[59] EXPLORING CULTURAL PROCESSES IN COMPLEX MIDDLE-RANGE SOCIETIES: OHIO HOPEWELL AND THE NORTHERN AND NORTHWESTERN EUROPEAN BRONZE AGE

Efforts to place cultures within the band-tribe-chiefdom-state evolutionary sequence can limit our analyses of cultural variability to a restricted set of cultural processes. This symposium explores diverse cultural processes in the archeological records of two seemingly complex middle-range societies—Ohio Hopewell and the Northern and Northwestern European Bronze Age. Discussions of symboling and ritual, the use of earthworks, exchange processes, boundaries, and social organization in these two different regions will point to commonalities and differences, which can enhance our interpretations of these archeological phenomena and our understanding of complexity in middle range societies.

[60] 25 YEARS OF VIEWING LOWLAND SOUTH AMERICAN PREHISTORY: RETROSPECT AND PROSPECT

This session summarizes advances in the archaeology of the South American lowlands from a culture historical perspective during the last 25 years. It addresses what we have learned and where we are going from both topical and specific culture-area perspectives. The session begins with four topical overviews in settlement patterns, paleo-subsistence, the contributions of rock art and ethnoarchaeology. It then turns to three regional summations from affiliated lower Central America (Costa Rica-Panama), and the Caribbean (Greater-Lesser Antilles), emphasizing connections. Next, four papers on lowland Colombia, Venezuela and Ecuador complete the western arc, with the lower Amazon in Brazil supplying the eastern arc. Substantive contributions reflect vastly altered views of the lowland role in South American prehistory during this period.

[61] FRONTIERS IN PHYTOLITH RESEARCH

Progress in archaeological applications of phytolith analysis continues to accelerate. Increases in reference data bases and improved methods for identifying taxa have been achieved. Geographic gaps closing and phytolith analysis is increasingly global in application. New approaches for interpreting archaeological phytolith assemblages have improved the utility of phytolith data. In addition to general paleoclimatic and paleoethnobotany applications, phytolith data is increasingly applied as well to more specific questions in both historic and prehistoric contexts.

[62] RECENT RESEARCH ON THE INCA

The tempo of research on the Inca empire of the Andes has been steadily increasing over the last few decades. New archival, and above all archaeological projects are providing data on the Inca and their subjects throughout the region, not just in the Cuzco heartland. This symposium will bring scholars up to date on the latest work in areas from Ecuador to Lake Titicaca in southern Peru, and in ecological zones ranging from tropical coast to desert coast, sierra, altiplano, and cloud forest. Papers will address the social, political, and economic organization of the indigenous cultures and the impact of Inca conquest, occupation, and expansion.

[63] ARCHAEOLOGY IN MUSEUMS: DYNAMIC INTERACTIONS AND MUTUAL CONSTRAINTS

The history of archaeology has long been intertwined with that of museums. As the cabinets of curios displaying archaeological artifacts gave way to the larger, more formalized institution we know today, archaeology found an operational home. Museums provided a professional habitat and material resources to archaeologists, who in turn generated fresh collections of ancient items for their sponsors. They also fired public imagination with tales of their exploits, thereby helping to fill museum coffers. The symposium will explore this symbiotic relationship and its lasting impact on the development of both the discipline and the harboring institution. Individual papers will examine different facets of their complex association to create a dynamic, diachronic picture of a still-evolving interaction.

[69] U.S. FOREST SERVICE HERITAGE RESOURCES PROGRAM

An array of Forest Service Heritage Resource projects and programs will be represented in this thematic Poster session.

[70] HOLOCENE ENVIRONMENTAL TRANSFORMATIONS IN OCEANIA: MICROCO_SMS OF "GLOBAL CHANGE"

Oceanic islands, noted for their isolation and high levels of biotic endemism, were among the last places on earth to be colonized by humans. Such islands, with short Holocene cultural sequences, provide microcosms for examining the human dimensions of so-called "global change." Recent inter-disciplinary research in central Polynesia provides abundant evidence for assessing the role of prehistoric humans in changing island ecosystems, as well as the reciprocal effects of environmental change on indigenous economic, social, and political structures. This symposium brings together the results of collaborative research in geomorphology, palynology, zooarchaeology, and archaeology to examine these issues.

[71] SOCIAL PERSPECTIVES ON EAST AND SOUTHEAST ASIAN PREHISTORY

Recent archaeological research in East and Southeast Asia is represented by the growth in, and innovative uses of, social perspectives as frameworks to examine and interpret this area's prehistory and early history. Several important theoretical issues are examined in this session, including: the spatial expression of segmentation, the development of ritual and its sociopolitical uses, the development of craft specialization, the context of interpolity interaction, and the development of complex societies. This symposium highlights the contributions the East and Southeast Asian archaeological record can make to our anthropological understanding of the complex nature of social processes.

[72] ARCHAEOLOGICAL SCIENCE: PAST ACHIEVEMENTS/FUTURE DIRECTIONS

This symposium will present reviews of major accomplishments of the various segments of archaeological science fields since the appearance of *Science and Archaeology* (2nd edition 1969) in terms of how interdisciplinary data generated as a result of natural science/archaeology interface have influenced current archaeological views and research agendas. Contributors will project the course of archaeological science studies over the next decade and offer predictions of how these studies will influence future archaeological investigations both in the field and in the laboratory.

[73] INTERREGIONAL PROCESSES AND INTERPRETATIVE MODELS IN THE SOUTHERN CONE OF SOUTH AMERICA

The purpose of this symposium is to synthesize critically some recent literature and investigations in different regions of the Southern Cone of South America. The coverage by participants focuses on cultural historical and/or cultural processual models of local development and interregional interaction for different cultural developmental periods and/or specific topics of investigation.

[74] STUDENT AFFAIRS COMMITTEE WORKSHOP "IS THERE A FUTURE IN ARCHAEOLOGY?"

The future of Archaeology is of critical importance to students. Upon graduating, students will encounter a diverse array of career opportunities: from academia to CRM, museums, state and federal agencies, and, increasingly, private or corporate employers. Workshop participants will discuss these options in terms of educational background and preparation, historical and demographic trends, and additional factors such as gender and minority representation and opportunities. Particular emphasis will be given to the relationships between alternative career paths and how students can best prepare for their professional life. Following the presentations, an open forum question-and-answer session will conclude with informal, small group discussions on topics such as vitae, cover letters, and interviews.

[75] RECENT DEVELOPMENTS IN THE ARCHAEOLOGY OF THE BELIZE VALLEY

During recent years, archaeological investigation of the Belize Valley has intensified as marked by the initiation of several new projects. The area had been the focus of earlier investigations, the most notable being the pioneering settlement survey directed by Gordon Willey. The cumulative data base from the various projects makes the Belize Valley one of the most intensively examined regions of the Maya Lowlands. Recently collected survey and excavation data have enabled researchers to refine existing models and provide new insights relevant to the reconstruction of the sociopolitical system of the Valley.

[76] THE ETHNOARCHAEOLOGY OF SETTLEMENT PATTERN: AGRICULTURAL SOCIETIES

Actualistic studies - historical, ethnoarchaeological and ethnoecological approaches to the archaeological record - are a powerful middle range research tactic for linking the structure of the archaeologi-

cal record at the regional scale with past systems of organized land use. The land use strategies of agricultural societies, deployed over complex ecological and social landscapes, present problems of scale for the ethnoarchaeologist: This symposium presents several theoretical orientations and methodological approaches to the problem of multi-scalar spatial organization. Theoretical topics include settlement ecology, risk reduction, decision-making, economic rationality and non-linear thermodynamics; methodological approaches address the use of landscape classification systems and the problem of controlled inference.

[77] TRADE AND SETTLEMENT GROWTH IN EARLY EUROPE

From the earliest appearance of permanent villages in Europe, trade between communities and between regions is evident in the archaeological records. From the Early Iron Age on, trade was extensive, and commerce played a major role in the development and growth of many communities. Papers in this symposium present a series of case studies, from the Early Iron Age into the medieval period, that examine the role of trade in the establishment and expansion of settlements in early Europe.

[78] THIRD MILLENIUM COLLAPSE IN WEST ASIA: CAUSES AND CONSEQUENCES

The late third millennium collapse of settlement systems and political structures in West Asia is redefined by three new data sets: 1. fine scale radiocarbon dates for the Aegean and northern Mesopotamia, 2. micromorphological and climatic data for Palestine and northern Mesopotamia, and 3. new settlement and political structure data for the Aegean, Palestine and northern Mesopotamia. Indus Valley collapse data may conform to those from adjacent regions. A new paradigm for third millennium collapse is emerging: synchronous, abrupt climatic change, settlement system collapse, demographic displacement, from the Aegean to the Indus, ca. 2200-1900 B.C.

[79] EARLY SALAOID PERIOD SETTLEMENT OF THE LESSER ANTILLES: IMPLICATIONS FROM THE TRANTS SITE, MONTSERRAT

Research in 1978-79 and 1990 at Trants confirmed a total site area of at least 0.6 square kilometers, a "core area" of 9 hectares, and an occupation spanning some 800 years, from ca. 500 B.C. to A.D. 320. This symposium explores field methods used, the ongoing analyses of artifactual and ecological data, and a statistical study of a museum collection of beads from Trants. Trants is one of the oldest, largest, and best preserved Salaooid sites in the Caribbean, and its location on Montserrat in the northern Lesser Antilles, far removed from the Salaooid homeland in South America, raises important issues about initial Ceramic Age settlement in the West Indies.

[85] CONTEMPLATING A QUARTER CENTURY OF ARCHAEOLOGY IN THE CENTRAL ANDES

This session will provide a broad overview of the progress that has been made over the last 25 years by archaeologists working in the Central Andes. The focus will be on investigations carried out in the highlands and on the coast of Peru. The session begins with a consideration of advances in paleobotany and zoarchaeology, and follows with a discussion of our changing understanding of prehistoric Andean technology and its implications for a better comprehension of Andean culture. The following seven papers are organized as a series of region overviews as follows: northern highlands, north coast, central coast, central highlands, south coast, southern highlands, and far south coast. The papers will consider substantive breakthroughs in Central Andean prehistory as well as the changing methodologies and theoretical perspectives of the archaeologists working there.

[86] TWO YEARS AFTER: REPATRIATION AND ITS IMPLEMENTATION

Two years after the enactment of the Native American Graves Protection and Repatriation Act archaeologists and museum personnel are confronted with the task of distinguishing the cultural affiliation of human remains and associated funerary objects from a variety of contexts. In addition, sacred objects and items of cultural patrimony are being identified in consultation with Native American groups. This symposium brings together an array of individuals who are charged with developing the regulations and guidelines to enact this procedure as well as others who are directly affected by the evolving interpretations and practical implementation of these laws.

The evaluation of existing programs in archaeology designed to meet the needs of the educator and student is critical to the improvement of these programs and the development of new programs in the future.

[88] SAA PUBLIC SESSION "MYSTERIES IN ARCHAEOLOGY: HOW ARCHAEOLOGISTS SEPARATE FACT FROM FICTION"

The 1993 SAA Public Session focuses on the processes archaeologists use to learn about the past. The speakers will discuss the ways frauds, misconceptions, and naive theories differ from archaeological conclusions. They will describe current scientific ideas about the peopling of the New

World and will tell how archaeologists determine if similarities between groups are the result of coincidence or direct contact. The SAA Committee on Public Education sponsors the Public Session to provide an opportunity for residents in the region of the annual meeting to learn more about archaeology.

[89] PATTERNING IN FAUNAL ASSEMBLAGES: NEW APPROACHES TO THE STUDY OF BUTCHERY AND TAPHONOMY

Archaeological faunal assemblages are products of both human behavior and non-human bone modification processes. The papers in this session describe a range of methods that have been developed to identify and interpret the natural and cultural processes that produce specific patterns in archaeological faunal assemblages. These methodological case studies reveal how historical evidence, ethnoarchaeological data, body part distributions, bone and shell fragmentation, and the distribution of cut marks on bones can be used to reconstruct past human behavior and to identify non-human assemblage formation processes.

[90] SEEDS TO GARDENS: TOPICS IN PLAINS ETHNOBOTANY

Great Plains subsistence studies have traditionally focused on hunting and, in particular, the procurement of bison. Despite historic records and eyewitness accounts of the importance of wild and domesticated plants in the diets of Plains peoples, ethnobotany is a poorly appreciated study in the Plains. This symposium attempts to bring to the attention of the profession the extent and the diversity of current research in Plains ethnobotany. Topics discussed include subsistence change, the development of agriculture, the importance of wild plants and domesticates, the reconstruction of diet through isotopic analysis, phytolith research, and experiments in Native American gardening.

[91] COBWEBS, BACKDIRT, AND PAYDIRT: RECENT RESEARCH AT THE MADISONVILLE SITE

The Madisonville site in Hamilton County, Ohio, is arguably one of the best known archaeological sites in eastern North America. First as the training ground for a generation of anthropologists, and later as the foundation for an archaeological culture, Madisonville has been a focus of attention for 115 years. Recent studies of museum collections, coupled with excavations at the site itself, have produced significant new information about the protohistoric and early historic occupation of the central Ohio Valley.

[92] CONTRIBUTIONS OF THE U.S. ARMY CORPS OF ENGINEERS TO NORTH AMERICAN ARCHAEOLOGY

The Corps of Engineers has played an active and extensive role in the identification, evaluation, and management of our nation's archaeological resources. Considerable archaeological work has been completed in support of Corps projects nationwide. This symposium examines the extensive range of archaeological work completed by the Corps and demonstrates through presentations by Corps archaeologists, contract archaeologists, and academics the contributions the Corps of Engineers had made to the science of archaeology. Particular focus is given to contributions in the following areas: geoarchaeology; GIS applications; regional archaeological contexts; and archaeological curation.

[93] TROPICAL COASTAL SUBSISTENCE

Coastal and estuarine environments in the humid tropical regions of Central and South America and the Caribbean offer human populations a wide range of subsistence opportunities. The relationship between environment and resource exploitation is often an unpredictable one. This symposium examines human diet, seasonal patterns of subsistence, resource procurement, and food preparation technologies at tropical coastal and estuarine sites in the circum-Caribbean and intermediate areas from 7000 BP to the present.

[94] ROCKS AND SALT: ECONOMIC VARIABILITY IN THE SOUTHERN MAYA LOWLANDS FROM HELLHOLES TO SKY PALACES

The five centuries between AD 500 and 1000 encompasses a complex pattern of regional development and denouement in the Maya lowlands. These patterns, whose decipherment is still illusory, are complicated by the syncopated and synecdochic nature of archaeology. The aim of this symposium is to cut into this Gordian conundrum, exploring the parallels and contrasts between particular communities or sub-communities, each representing a distinctive economic niche. The papers of this symposium offer a view of the broad range of variation that existed in the Southern Lowlands. In the discussion following the presentation, the discussant will compare these cases from the Southern Lowlands with his own work in the state of Yucatan, Mexico.

[95] EMERGING COMPLEXITY AT THE MAYA SITE OF KICHPANHA, BELIZE

The excavations conducted at Kichpanha since 1985 have helped define the presence and influence of an elite class at this site by the end of the Late Preclassic Period and continuing through the Early Classic. The style and symbolism associated with these occupations are consistent with those noted for many of the dominant sites in the Maya Lowlands. The papers presented in this symposium will evaluate, using different data sets, the role of Kichpanha within the context of emerging social and economic complexity. The further evaluation of Kichpanha will clarify how moderate-sized communities participated and affected the development of complexity in the region.

[96] CURRENT PERSPECTIVES ON ILLINOIS ARCHAEOLOGY: THE NORTH SPEAKS FOR ITSELF

Recent and extensive survey, in-depth testing, and full scale excavation of sites performed by a number of universities and independent contractors in northern Illinois enable archaeologists to generate a picture of prehistoric and protohistoric lifeways independent of culture histories built upon research in central and southern Illinois. Research presented in these papers can now be used in comparison with data from the other regions to address such questions as subsistence practices, settlement location, and the role of material culture in the maintenance of social boundaries, as well as to provide definition and clarification of temporal phases within the region.

[102] MOUNDVILLE REVISITED: A ROUNDTABLE DISCUSSION

The Moundville site in west-central Alabama—already one of the best known Mississippian centers—has been the focus of much additional research over the past decade. New information provokes us to refine, to re-think, and in some cases to challenge previous interpretations concerning this center and its satellite communities. Participants in this roundtable session will jointly take stock of certain recent developments, will provide a mutual critique, and, looking ahead, will reflect on the possibility of a revised synthesis.

[103] CHANGING PERSPECTIVES OF NAVAJO CULTURE: RECENT RESEARCH ON NAVAJO ARCHAEOLOGICAL SITES

Navajo adaptation and culture history have been defined by anthropological-linguistic models, limited historic documents, and sparse archaeological research for much of this century. Recent research on Navajo sites, both inside and outside the current Navajo Nation boundaries, is changing longheld assumptions about Navajo culture, history and adaptation. These new data are forcing us to change our views of Navajo origins, interaction, land-use, and adaptation during the last five centuries. The papers in this symposium discuss the material correlates of the changing role of the Navajo in the Southwest f153, during the protohistoric, historic, and modern periods.

[104] THE EMERGENCE OF POTTERY

This symposium brings together recent world-wide research on the appearance of pottery as a craft and provides new perspectives on the nature of invention and adoption of pottery and ceramics manufacturing. Potting is closely tied to important developments in past societies. The local emergence of potting, in many cases rapid, was dynamic and followed different trajectories. Models of pottery invention and adoption are now increasingly testable, particularly through technological and archaeometric research. These papers present a fresh set of individual perspectives on the central phenomenon of the emergence of pottery from the Old and New Worlds.

[105] THE INKA EXPANSION INTO THE SOUTHERN ANDES: THE VIEW FROM THE CALCHAQUI VALLEY, ARGENTINA

This symposium presents the 1990–92 Proyecto Arqueológico Calchaquí's research into the effects of Inka rule in the Calchaqui Valley, northwest Argentina. Participants discuss study of political economy and settlement at Inka, Santamariana (local), and Inka-Santamariana settlements. Topics include settlement patterns; site planning; architecture; production and use of botanical, ceramic, metal, and wealth materials in residential and ceremonial contexts. This region exhibited two patterns of state-subject relations: segregated imperial occupation in the north and integrated state-local settlement to the south. Patterning in material remains further reflects differential access to foods and finished goods and segregated production activities at state and subject settlements.

[106] NEW DIRECTIONS IN AMERICAN BOTTOM ARCHAEOLOGY

Since the publication of the American Bottom Summary volume nearly a decade ago, additional investigations have been undertaken in the American Bottom. This work has greatly expanded the data base with respect to the environmental setting and the cultural sequence. While it is imperative that a viable sequence be established, the ultimate goal is to delineate the dynamics that occur across space and through time within the region known as the American Bottom. The various papers will

highlight the regional scope and implications of the work with continued refinement and clarification of the culture-historical sequence.

[107] MICRO-ECONOMY, MIDDLE RANGE THEORY, AND THE HOHOKAM

Recent work in Arizona has produced valuable data on the micro-economy of Hohokam settlements. Micro-economy here refers to the procurement and allocation of resources and the distribution of activities within a site. Synthesis of these findings has lagged in relation to the formulation of higher order interpretations dealing with relationships among Hohokam communities. This symposium redresses this imbalance by presenting new interpretations from structures, activity areas, botanical remains, and other artifacts. It does so in the context of middle range theory, that is, with reference to rigorous frameworks for determining "what happened" at the site level.

[108] FINS, FEATHERS, FUR AND FIRE: NEW ALLIANCES IN THE U.S. FOREST SERVICE HERITAGE RESOURCES PROGRAM

In response to public demand for sustainable land and resource management, the U.S. Forest Service has established an ecologically-based, integrated resource policy. The heritage initiative, in implementing the principles and aims of ecosystems management, is basically an effort to apply the archeological and historical principles of the discipline to practical purposes that are not in themselves pure heritage resource research or compliance oriented. This symposium presents a variety of examples where archeological and historical data are being studied in an attempt to help resolve contemporary natural resource issues facing National Forests.

[109] GOVERNMENT RELATIONS AND THE ARCHAEOLOGIST: MAKING A DIFFERENCE IN PUBLIC POLICY

Government policies at the federal, state, local and tribal level make a significant impact on the way archaeology is or is not done. Individuals, including archaeologists, have an important role to play in effecting the outcome of public policy. Based on first hand experience, professionals will discuss the trials, tribulations, and sometimes exultation of being directly involved in the lobbying process. Experts will present case studies from local government, state government, tribal government and federal government of how an archaeologist worked either to affect legislation or change government regulations and policy. In addition several discussants will provide their perspective on the effectiveness of such work.

[110] OLD WORLD TRADE AND INTERACTION IN THE FOURTH AND EARLY THIRD MILLENNIA B.C.

In this symposium participants will discuss theoretical models and empirical data that have been used to explain regional interaction in the Old World in the fourth and early third millennia B.C. The areas under consideration will include Arabia, Egypt, Sinai, Palestine, Transjordan, Transcaucasia, Mesopotamia and Elam. This symposium is intended to be interdisciplinary drawing on scholarship from many fields including Anthropology, Egyptology, Near Eastern Languages and Civilizations and Syro-Palestinian Archaeology.

ABSTRACTS OF PAPERS

Abbott, David (Arizona)

[100] DIFFERENTIAL PARTICIPATION IN LOCAL EXCHANGE NETWORKS: EVIDENCE FOR INCIPIENT SOCIAL STRATIFICATION AMONG THE CLASSIC PERIOD HOHOKAM

The exchanges of utilitarian pottery between Hohokam villages in the Phoenix area, Arizona, during the Classic period were typically restricted to villages that cooperated in the operation of irrigation canals. An exception is Pueblo Grande, perhaps the largest and most influential settlement in the Phoenix Basin, which regularly received plainware pottery from beyond its canal system. Only segments of the inhabitants at Pueblo Grande, however, participated in that exchange. These same segments also had greater access to imported products made by specialists, suggesting status differentials within the community that are consistent with incipient social stratification.

Ackert, Lawrence (New South Associates)

[98] THE PRODUCTION, USE, AND DISTRIBUTION OF METAVOLCANIC RAW MATERIAL FROM THE SLATE BELT: AN EXAMPLE FROM CENTRAL NORTH CAROLINA

The Slate Belt is a group of fine-grained metavolcanic and sedimentary rocks of Precambrian to Paleozoic age outcropping mainly from Virginia to Georgia. This area was utilized during prehistory as a source of lithic raw material. Due to its geological complexity, little research has been directed toward the identification of raw material types at individual lithic sources or the distribution of these materials from their respective sources. This paper presents results of research regarding the documentation and distribution of source-specific raw materials from a Slate Belt quarry in central North Carolina, using an expedient, easily replicated methodology involving macroscopic variables.

Ackerman, Robert (Washington) [Discussant 19]

Ackerman, Robert (Washington)

[19] PROJECTILE POINTS AND MICROBLADES IN SOUTHWEST ALASKA

The early human occupation of Alaska between 11,000 and 10,000 years ago appears to be represented by (1) two separate cultural assemblages, the Nenana, the earliest complex, with a bifacial industry, but without microblades and the somewhat later Denali complex with microblades and with-without an associated bifacial industry, or (2) a single cultural complex with the variation due to seasonal or site specific variation. Data from artifact assemblages recovered from sites excavated in non-glaciated areas of the central Kuskokwim River region during summer 1992 will be presented as a further discussion of this question.

Ackerman, Robert (Washington)

[88] BY SEA OR BY LAND? THE EARLIEST IMMIGRANTS TO NORTH AMERICA

Speculations as to the origin and antiquity of the Native Peoples of North America prior to archeological investigations in Alaska and North Asia were limited only by the imagination of a particular author. Claims for the landfall of ancient Middle Eastern, African, European or mythic Atlantean/Muvian mariners and their establishment of civilizations in the New World have long been advanced. Against this mythic backdrop, the equally amazing, but factual, story of the ancient movement of peoples out of the vastness of Asia, across the Bering Land Bridge and into North America will be explored.

Adair, Mary (Kansas)

[90] PRE-MAIZE GARDENING IN THE CENTRAL PLAINS

Archaeobotanical data and bone isotopic studies combine to demonstrate that maize consumption dominated the subsistence economies of Village period populations in the Central Plains. During the preceding Woodland period, however, domesticates such as *Helianthus annuus* (sunflower), *Iva annua* (marshelder), and *Cucurbita pepo* (squash) as well as wild plants and nuts, such as *Chenopodium sp.* (goosefoot) and *Juglans nigra* (black walnut) are well represented in archaeobotanical samples. These plant remains suggest a mixed gardening and plant collecting economy which contributed to the development of a sedentary village lifestyle.

Adler, Michael (Southern Methodist)

[100] WHY IS A KIVA? PREHISTORIC PITSTRUCTURES IN THE TAOS REGION, NORTHERN NEW MEXICO

Building upon Watson Smith's (1952) well-known article that asks "when is a kiva?", this paper utilizes both published and unpublished archaeological data from the northern Rio Grande region

to investigate the roles played by socially integrative structures (kivas) between A.D. 900-1500. Traditionally, the dichotomy between pithouse and kiva has rested upon temporal and architectural criteria. Functional implications of structure use (i.e., domestic vs. religious) are then determined based upon the architectural pedigree assigned to the structure. An alternative approach is proposed that recognizes a continuum between "domestic" and "ritual" uses of pitstructures, avoiding many of the typological pitfalls that continue to cloud the pithouse-kiva debate.

Adovasio, J. (see Dirkmaat, D.) [80]

Adovasio, James (Mercyhurst) *Olga Soffer (Illinois)* and *Dennis Dirkmaat (Mercyhurst)*

[64] TRASH PITS AND MIDDENS: ANOTHER LOOK AT DIFFERENTIAL SITE-USE PATTERNS AT MEZHIRICH

Analyses of newly collected flotation samples from the ca. 15,000 B.P. Upper Paleolithic site of Mezhirich in the Ukraine are focussed on identifying and characterizing differential site-use and occupancy patterns. Samples collected from extramural trash pits are compared to materials extracted from intact midden areas surrounding Dwelling 4. Differences in the kind and frequency of faunal, floral, and artifactual materials are quantified and assessed in terms of on-site activities and behaviors.

Ahler, Stanley (North Dakota) and *Matthew Root (Washington)*

[113] FOLSOM MOBILITY STRATEGIES VIEWED FROM WITHIN AND NEAR THE KNIFE RIVER FLINT SOURCE AREA, NORTH DAKOTA

The Jensen Site at Lake Ilo, North Dakota, contains new data on the complete sequence of Folsom bifaces manufacture in Knife River flint, from cobble quarrying to final fluting processes. Despite an abundance of local high-quality flint, Folsom inhabitants also imported non-local lithic materials in the form of early stage bifacial preforms. When augmented by lithic production data from locations more distantly removed from the Knife River flint source area, a model positing high Folsom group mobility with limited production for inter-group lithic exchange is supported.

Ahler, Steven (Illinois State)

[106] EARLY, MIDDLE, AND LATE ARCHAIC SETTLEMENT SYSTEMS IN THE AMERICAN BOTTOM AND CENTRAL ILLINOIS

Archaic site distributions are examined from three survey projects—the Modoc locality (American Bottom), Hunter Lake (upland central Illinois), and Panther Creek [near the confluence of the Illinois and Sangamon Rivers]. Environmental variables that may affect Archaic settlement patterns are analyzed, and potential changes in environmental parameters are explored. Changes in Archaic settlement patterns and potential environmental changes are examined to assess differential effects of the Hypsithermal climatic episode. Environmental changes partially explain the settlement pattern changes; cultural factors such as horticultural experimentation or population increases may also affect both site location (settlement pattern) and organization of populations (settlement system).

Ahlstrom, Richard (SWCA)

[83] DIMENSIONS OF CHANGE IN PREHISTORIC PUEBLO RELIGION

Recent studies of prehistoric Pueblo religion have approached the subject as architectural history, relating particularly to kivas, and as social history, relating particularly to social integration. This paper returns to a more basic approach, one concerned with the "history of religion." It discusses dimensions of change in Pueblo religion and their potential archaeological correlates, including patterning in kiva morphology. The paper begins, conceptually, with Lamphere's statement that "Pueblo religion seems to be based on an essentially shamanistic world view adapted to the needs of an agricultural people," and it ends, chronologically, with the advent of the kachinas, ca. A.D. 1400.

Aimers, Jim (Tulane) and *Jaime Awe (London)*

[53] AN EARLY CIRCULAR PLATFORM FROM CAHAL PECH, BELIZE

Round structures in Mesoamerica are relatively rare and have been interpreted in a variety of ways. A round platform excavated at Cahal Pech appears to be one of the earliest of its type yet recorded in the Maya lowlands, with a long sequence of use and modification. Artifacts and human remains from the structure suggest that it served as a performative platform, likely in relation to ancestor worship. From a broader perspective, the location, date, and formal qualities of this platform raise important questions about the nature of early Maya monumentality.

Albarracin-Jordan, Juan (Instituto Nacional De Arqueología De Bolivia)

[48] AYLLU AND THE PACAJES "CHULLPA"

The Pacajes Señorío, a post-Tiwanaku polity that flourished between A.D. 1100 and ca. 1540 in the south Central Andes, utilized diverse funerary structures. These differences appear to be related

to the dual partitioning of the polity into complementary segments, namely Uma-Pacajes and Urgu Pacajes. This paper examines this variability and its implications for interpretations on the ayllu. The ayllu is primarily evaluated in terms of its economic strategies and its political organization, as inferred from the archaeological record and ethnohistoric as well as ethnographic documents, rather than tracing it only through ancestor worship.

Alexander, Rani (New Mexico)

[76] THE POLITICAL LANDSCAPE AND SETTLEMENT ARCHAEOLOGY IN COLONIAL PERIOD YAXCABA PARISH, YUCATAN, MEXICO

Colonial period settlement patterns in the Parish of Yaxcaba, Yucatan, Mexico are examined in light of late eighteenth and early nineteenth century historic information in order to link Spanish colonial economic organization to specific archaeological patterns. The dual colonial economy manifests itself in the archaeological record at two levels: regional settlement organization and community site structure. The organization of the settlement hierarchy and differences in site structural patterns among communities are related to variation in the strategies of risk reduction conditioned by a settlement's position, within the political landscape and its articulation with the larger colonial economic system.

Allen, Kathleen (Pittsburgh)

[80] FORM AND FUNCTION IN IROQUOIAN CERAMICS

Late Woodland ceramics in the eastern Great Lakes area are predominately a homogeneous group of utilitarian earthenware with few overt (formal) indications of functional differences. Approximately 200 whole vessels from two contact period (ca AD 1610-1625) Seneca sites are analyzed. Variability in form, volume, and evidence for use are examined for insight into functional differences in Iroquoian ceramics.

Allen, Melinda and Kevin Johnson (Bishop Museum)

[70] PATTERNS OF INTERACTION IN THE SOUTHERN COOK ISLANDS

The southern Cook Islands are a widely separated chain of eight islands covering 700 km in the southeast Pacific. Recent archaeological research on Aitutaki and other islands in the group indicate that despite significant inter-island distances, communication was maintained between island communities over a roughly five hundred year period (1000 to 1500 BP). Subsequently, interaction networks appear to have deteriorated. This paper considers the extent, direction, and timing of these patterns of interaction based on the distribution of two unevenly distributed raw materials, pearl-shell (*Pinctada margarifera*) and basalts. Conditions fostering early interaction and subsequent isolation are also explored.

Allen, T. (see Saunders, J.) [67]

Allen, W. (see Griffin, K.) [2]

Ambos, E. (see Johnson, R.) [35]

Ambrose, Stanley (Illinois-Urbana) and Lynette Norr (Illinois)

[28] RELATIONSHIP OF CARBON ISOTOPE RATIOS OF DIETARY PROTEIN AND ENERGY TO THOSE OF BONE COLLAGEN AND APATITE

Dietary interpretation of stable carbon isotope ratios of prehistoric human bones is ambiguous. Do carbon isotopes of bone collagen reflect the whole diet or dietary protein? Do those of bone apatite reflect mainly energy (carbohydrates, fats) or the whole diet? Results of seven controlled diet experiments, with protein and energy of different carbon isotope ratios, show that collagen mainly reflects the isotopic composition of dietary protein but carbonate accurately reflects that of, the whole diet. Collagen carbon isotopes substantially underestimate the isotopic composition of the non-protein component of diets when protein and energy have different carbon isotope ratios.

Ambrosino, James (Southern Methodist)

[37] KATUN HISTORY IN THE CLASSIC MAYA LOWLANDS: EVIDENCE AND IMPLICATIONS

Recently a number of authors have made reference to the Maya conception of history in an attempt to understand the rituals and actions of Colonial Period and modern Mayas. They have focused on the concept of katun history which embodies both ideas of history and prophecy. Hieroglyphic and iconographic sources from the Classic Period suggest that this concept was not an invention of the post-conquest Maya, but is part of a longer tradition. This paper will examine the Classic Period evidence for katun history and explore its implications for the study of the archaeological and epigraphic records of the Maya.

Ames, Kenneth (Portland)

[21] PATHWAYS TO INEQUALITY IN NORTHWESTERN NORTH AMERICA

Current problems in explaining the evolution of social inequality on the Northwest Coast include the causal relationships between stratification and 1) control of natural and social resources; 2) control of labor (including institutionalized slavery, and the development of specialization; 3) warfare; 4) sedentism and the formation of coresidential corporate groups; 5) storage; 6) population growth; 7) regional dynamics; and 8) human nature. Disentangling these causal links is confounded by an archaeological record which suggests both impressive cultural and social continuity and stability on the one hand, and considerable social and economic change on the other.

Ames, Kenneth (Portland)

[58] PALEOETHNOARCHAEOLOGY ON THE SOUTHERN NORTHWEST COAST

Recent research at two archaeological sites allows for the careful integration of archaeological, ethnohistoric and ethnographic data in the exploration of a set of distinct yet related problems of sedentary complex hunter-gatherers. These include: a) the household ecology; b) economic, settlement and land use patterns and c) the local effects of the European presence in the hemisphere prior to the first documented impact of first direct contact. The two archaeological sites: Cathlapottel, a Chinooken town described by Lewis and Clark, and the Meier site which contains a large single plankhouse erected ca. AD 1400 and abandoned sometime after 1800.

Ammerman, Albert [Discussant 76]

Anderson, K. (see Chenuault, M.) [107]

Anderson, L. (see Dore, C.) [37]

Anderson, Lora (Cincinnati)

[112] ROCK ART AND LAND-USE PATTERNS IN THE ARCHAIC SOUTHWEST: A CASE STUDY IN THE UPPER BASIN, COCONINO COUNTY, ARIZONA

Little Archaic material culture has been recovered in the Upper Basin, an area just south of Grand Canyon National Park in Arizona. A single rock-art site, however, provides some evidence concerning Archaic occupation of the area. The site, MU 1000, is a small rock shelter containing 19 pictographs. This paper employs stylistic, locational, and ethnographic data to interpret MU 1000's function and the site's role in Archaic land-use patterns. Results indicate the pictographs record the population's movements through the Upper Basin in relation to their subsistence strategy.

Anderson, Pia (California-Berkeley) and Susan Anton (California-Berkeley)

[70] HUMAN BONE MODIFICATION?: AN ISLAND EXAMPLE AND ITS IMPLICATIONS

Because of the presence of burial caves on Mangaia (Cook Islands, Polynesia) and the prevalence of ethnohistoric accounts of cannibalism, the human (n = 47) and large mammal (n = 397) fauna recovered by the Mangaia project were examined for signs of human intervention. All remains were highly fragmented; most pieces were smaller than 5cm. The largest site (Man-44) produced 22 human bone fragments representing a minimum of 8 individuals (4 adult and 4 juvenile). All fauna exhibited similar patterns of human modification (burning, peeling/fracturing and working) and were frequently found in association. Only nonhuman bone exhibited rodent gnawing (12%) or cutmarks (0.02%). Human bone was concentrated in younger levels (68%). The assemblages show clear evidence of human modification, however, the sample and fragment sizes preclude suppositions as to the ultimate goal of such intervention.

Anderton, J. (see Martin, T.) [108]

Angelini, Mary Lee (Boston)

[57] CLAY SOURCING AT K'AXOB BELIZE

Sherds from the Middle and Late Preclassic period from K'axob Belize are compared to clays from the region using petrographic analysis as the primary investigative tool. The findings give evidence of change over time both in technology and in the clay sources being exploited. Additional variation in the appearance of clays and sherds seems to be related to variation in firing temperatures. These findings suggest very localized production of Preclassic vessels which were shaped and decorated in a manner consonant with the Lowland tradition of Lopez Mamom and Cocos Chicanel ceramic complexes.

Anton, S. (see Anderson, P.) [70]

Anyon, R. (see Othole, A.) [23]

Anyon, Roger (Zuni Archaeology Program) and T. J. Ferguson (Institute of North American West)
[86] REPATRIATION AT ZUNI: A CASE STUDY

In 1978 the Pueblo of Zuni embarked on a long term campaign to repatriate its War Gods. Several key elements of the Zuni War God repatriation position were incorporated into the Native American Graves Protection and Repatriation Act. This paper details the diverse positions developed by the Zuni Tribe on the proper care and treatment of a range of cultural property and ancestral human remains. The complexity of Zuni positions and the process by which tribal policies are developed provide a cogent example of why repatriation issues should be resolved on a case by case basis.

Arnold, Battina (Minnesota)

[77] IN VINO VERITAS: PERISHABLE EXOTICA IN EARLY IRON AGE TRADE BETWEEN THE WEST HALLSTATT ZONE AND THE MEDITERRANEAN

Discussions of prestige good economies tend to focus on the role of nonperishable exotic imports. Perishable exotica are a less well understood vehicle of intercultural exchange, of significant value in understanding the transformative nature of trade on partners at both ends of the trade network. Sumptuary restrictions played a significant role in early Iron Age society in west-central Europe. Wine seems to have been one of the most important of the perishable exotica involved in the exchange between the West Hallstatt area and the Mediterranean, and this paper will examine the role it played in the socio-economic life of the early Iron Age.

Arnold, Charles (see Morrison, D.) [19]

Arnold, Jeanne (UCLA)

[21] INEQUALITY, MARGINALIZATION, AND ECONOMICS

Emerging elites may guide economic developments in various ways. For instance, while some elites accrue information, privileges, and status markers for themselves, they bring economically dependent sectors of the population-such as craft or subsistence specialists-into core spheres of production activity while simultaneously marginalizing them from positions of real political/economic influence. If elites control information or technology critical to economic success and they orchestrate networks of interdependencies which limit individual power, they effectively perpetuate inequality. Common sources of power include control over labor, information, resources, and transportation.

Arnold, P. (see Santley, R.) [49]

Arnold, Philip (Chicago)

[7] DOMESTIC ACTIVITIES AND HOUSELOT ORGANIZATION IN THE SIERRA DE LOS TUXTLAS, VERACRUZ, MEXICO

The remains of sedentary, agricultural communities constitute the majority of the Mesoamerican archaeological record. Establishing dependable links between the organization of such domestic spaces and their resultant material patterns is thus crucial. This paper presents site structural data collected from a sample of residential houselots in southern Veracruz, Mexico. Surface artifact distributions are used to explore the effects of activity organization on the spatial and compositional character of the material record. The results underscore how the nature of the task and the available area within the houselot serve to structure domestic activities and influence material deposition.

Arnold III, Barto (Texas Historical Commission)

[109] HOW RALLYING THE GRASSROOTS HELPED TO SWING THE SHIPWRECK ACT

Sustained pressure from the grassroots level of the archaeological and historic preservation communities was one of the key factors in the successful campaign for a shipwreck law. The elements required to organize and carry out this effort will be discussed.

Arriaza, Bernardo (Nevada)

[9] A SYNTHESIS OF THE CHINCHORRO CULTURE

The Chinchorro were fishermen who inhabited the coast of southern Peru and northern Chile and had the oldest system of artificial mummification in the world (6,000-2,000 B.C.). Red, Black, Bandage, Mud-coated, and Natural mummies were the main mummy styles, which correlated to changes through time. These mortuary practices implied they were deeply concerned with the afterlife and ancestral worship. Their subsistence led to many health problems such as spondylolysis and auditory exostosis. Treponematosis lesions observed on their tibias were probably related to their mummification practices.

Artz, Joe (Iowa) and E. Arthur Bettis III (Iowa Department of Natural Resources)

[36] HOLOCENE GEOLOGY AS AN AID IN ARCHAEOLOGICAL SURVEY: AN EXAMPLE FROM THE UPPER MISSISSIPPI VALLEY

Geological study can be an indispensable first step in archaeological survey. The study need not be exhaustive, provided the archaeologist continues the task of stratigraphic recording begun by the

geologist. In a recent survey of an alluvial fan in eastern Iowa, a geological coring program provided stratigraphic descriptions that were both used and expanded upon during subsequent archaeological testing. The geoarchaeological survey resulted in a detailed illustration of alluvial fan aggradation, and established a stratigraphic framework for the site's Late Woodland through Middle Archaic cultural record.

Arzigian, C. (see Moffat, C.) [98]

Asch, David (Iowa)

[43] ARCHAEOLOGICAL PLANT REMAINS AND STRATIGRAPHIC INTERPRETATION

In the organization of archaeological research projects, paleoentomologists have largely been consumers of stratigraphic interpretations. But if carbonized plant remains have been collected systematically by flotation, they are potentially sensitive indicators of stratigraphy. Attributes of the botanical record that make it especially well suited for this type of analysis are discussed. Examples of botanical stratigraphies are given from archaeological sites in the midwestern U.S.

Asch, David

[90] EVOLUTION AND DOMESTICATION OF THE COMMON SUNFLOWER (*HELIANTHUS ANNUUS*)

Forty years ago, Charles B. Heiser, Jr. proposed a scenario for evolution and domestication of common sunflower (*Helianthus annuus*). Before humans arrived, its wild range was restricted to the West. Subsequently, it became a weedy campfollower and expanded into the East. There a more robust weed form evolved, which was taken into cultivation and gradually domesticated. This paper reviews Heiser's model from phytogeographical and archaeological perspectives. Common sunflower, it is concluded, was native to natural disturbances on the Plains. East of Kansas and Nebraska, it would not have persisted prehistorically without occasional saving and sowing of seed by humans.

Ashmore, W. (see Yaeger, J.) [75]

Austin, R. (see Johnson, R.) [103]

Awe, J. (see Healy, P.) [37]

Awe, J. (see Aimers, J.) [53]

Awe, Jaime (London)

[75] THE FORMATIVE PREHISTORY OF THE BELIZE VALLEY: RECENT EVIDENCE FROM CAHAL PECH

Investigations at the upper Belize River Valley site of Cahal Pech have recorded a stratified sequence of occupation that spans from the early Middle Formative (1000 B.C.) to the Late Classic period (900 A.D.). This paper describes the morphology of Formative occupation at the site, and it discusses the regional and interregional implications of this data.

Ayers, D. (see Wheeler, C.) [103]

Bacus, Elisabeth (Michigan)

[71] THE CONTEXT OF INTERACTION AMONG LATE PREHISTORIC CHIEFDOMS IN THE CENTRAL PHILIPPINES

Current models of chiefly political economy point to inter-polity interactions as important to the development and support of elite political power. Research at late prehistoric chiefly centers in the central Philippines indicates that their political economies evidenced internal intensification and increased involvement in inter-polity competition for foreign prestige goods. Earthenware data from these sites, and from a recently excavated chiefly center in SE Negros, allow investigation of the types and contexts of interactions among these polities. This paper presents results from stylistic and technological analyses of the decorated earthenwares, and discusses the implications for understanding the dynamic context of inter-chiefly interactions.

Bade, Mary and Rhonda Lueck (US Army Corps of Engineers)

[92] CURATORIAL NEEDS ASSESSMENT AT DEPARTMENT OF DEFENSE INSTALLATIONS

In 1992, the Army Corps of Engineers, St. Louis District, initiated a comprehensive evaluation of archaeological collections curated at military installations as mandated by federal law. An important element of this needs assessment program involved recognizing and inventorying human skeletal remains according to NAGPRA. Over 40 repositories were inspected. The majority of curation facilities housing military collections are substandard, evidenced by improper cleaning, cataloging, and general deterioration of collections. This paper describes the current status of human skeletal and archaeological collections, examines major collections deficiencies, and presents a strategy for the correction of these deficiencies.

Baker, Joseph (PA SHPO) [Discussant 17]

Ball, Terry (Brigham Young)

[61] PHYTOLITH MORPHOMETRICS: THE USE IMAGE ANALYSIS FOR MORPHOLOGIC AND SYSTEMATIC STUDY OF WHEAT PHYTOLITHS

The use of Computer-Assisted Image Analysis Systems (IAS) and morphometrics has the potential to become a new paradigm for phytolith systematics. This paper presents two studies which incorporate IAS and morphometrics. The first study evaluates the morphometric and typological differences between phytoliths extracted from the culms, laminae, and inflorescence bracts of *Triticum monococcum*. Results indicate that some unique types of phytoliths are produced in lamina and inflorescence tissue. Moreover, silica cell phytoliths produced in lamina tissue are significantly larger ($p < 0.05$). The second study presents two taxonomic tools developed for identification of three neolithic wheat cultivars based on the morphometries of their respective phytoliths. The first tool is a key which uses the means of phytolith morphometries as discriminators between the taxa. The second tool is a set of discriminant functions based on several phytolith morphometries.

Bamforth, Douglas (Colorado)

[113] SPATIAL AND TEMPORAL VARIABILITY IN PALEOINDIAN LANDUSE IN THE MEDICINE CREEK DRAINAGE, SOUTHWESTERN NEBRASKA

This paper compares the assemblages from the Allen, Lime Creek, and Red Smoke sites, all dated between 10,800 and 8000 BP and all located within a mile of one another. Lithic and faunal assemblages vary greatly among these three sites: the Allen site seems to have been a residential location but Lime Creek and Red Smoke produced more specialized assemblages tied to stone tool production, suggesting very local variation in site use. Over time the Allen site comes more and more to resemble Lime Creek and Red Smoke. This trend probably reflects a trend towards increasing residential mobility over time.

Bard, Kathryn (Boston University)

[78] STATE COLLAPSE IN EGYPT IN THE LATE THIRD MILLENIUM B.C.

During the last two dynasties of Egypt's Old Kingdom sociopolitical "pathologies" are seen which caused major economic problems for the centralized state. The state finally collapsed at the end of Dyn. 6, ca. 2181 B.C., followed by a period of political fragmentation known as the First Intermediate Period. Climatic change during the late 3rd millennium B.C. may have exacerbated the socio-political pathologies that led to the collapse of the Old Kingdom. Given a greatly increased population during the Old Kingdom, lower agricultural productivity as a result of disastrously low Nile floods and less floodplain land under cultivation caused widespread famine and anarchy.

Barker, Alex (Michigan)

[16] SETTLED ON COMPLEXITY: CENTERS AND THE DEFINITION OF SOCIAL COMPLEXITY IN THE LOWER MISSISSIPPI VALLEY

Coles Creek polities have been interpreted in a variety of ways by different researchers, each informed by a different set of theories and assumptions regarding the nature of social complexity. Ways in which these constructs have influenced interpretations of the complexity of Coles Creek society are discussed, with the suggestion that application of cultural taxonomies and stage sequences to marginal cases often not only suppresses significant variation within stages, but masks commonalities between them as well. One such commonality, the role played by political centers in the production and reproduction of social asymmetries in the Lower Mississippi Valley, is examined.

Barnes, Gina (Cambridge) [Discussant 4]

Barnes, Monica (Cornell)

[62] INCA SORAS

Soras, a district capital of Lucanas, Ayacucho, Peru incorporates Inca features including Cusco-style ashlar masonry and an orthogonal plan. Roads, including monumental stairways, connect Soras to modern, LH, LIP, and MH sites. Soras ceramics appear unique. Many published and unpublished ethnohistorical accounts mention Soras and shed light upon its colonial and incacite occupations, and on the Soras ethnic group of the LIP. In spite of Soras' importance, it usually does not figure in studies of the Inca or on maps of Tawantinsuyu. This paper discusses survey and ethnographic data allowing us to form an archaeological and historical picture of Inca Soras.

Barnett, William (American Museum of Natural History)

[104] EARLY POTTERY AND THE NEOLITHIC TRANSITION IN THE CENTRAL AND WESTERN MEDITERRANEAN

The first pottery in the Mediterranean is notable in its rapid spread and broad stylistic and technological uniformity. Whereas these Early Neolithic wares are associated with a transition to agricultural societies, they are found in contexts that demonstrate the persistence of Mesolithic hunting and

gathering economies. Multi-scale exchange mechanisms that can be documented for Early Neolithic pottery may have also served indigenous adoption of domesticates. Causal models of the agricultural transition in the Mediterranean may therefore lie more in exchange of surplus goods than in environmental or demographic stress.

Barr, K. (see Wiant, M.) [92]

Barse, W. (see Lothrop, J.) [40]

Bar-Yosef, Ofer (Harvard)

[25] LATE PLEISTOCENE ART IN THE NEAR EAST—WHY SO LITTLE?

The archaeological sequence of late Pleistocene industries in the Near East is quite well known. In spite of the relatively small number of excavated sites, art objects are scarce. The number increases at the closing millennia (e.g., in the Natufian culture). The use of the 'stress model' that was documented for South Africa by Lewis-Williams, does not explain the current situation either in the Near East or North Africa. Recorded periods of harsh climatic and social conditions during the 45-13 k BP time-span indicate that a different model should be developed.

Bates, J. (see Morgan, R.) [2]

Bauer, Brian and Wilton Orosco

[62] THE SHRINES OF ANTA

Systems of shrines, organized along lines (or pathways), radiating out from village centers may have been common, if not universal, features of pre-Hispanic communities in the Andes. One such system was located in Cuzco and it has received extensive attention by a number of ethnohistorians and archaeologists. Other pre-Hispanic system in the Andean highlands have not, however, been clearly identified. In this report, we analysis the distribution of some 22 shrines in the Province of Anta, Department of Cuzco, to determine whether evidence for a pre-Hispanic shrine system can be detected in this region of the Andean highlands.

Baugh, Timothy and Thomas Killion (Smithsonian Institution)

[86] THE RESPONSE TO REPATRIATION: A LOOK AT MUSEUM APPROACHES IN THE UNITED STATES

The repatriation provisions of two recent laws (the Native American Graves Protection and Repatriation Act and the National Museum of the American Indian Act) have already set in motion major and sometimes daunting changes in curation and research practices at many of the nation's major museums. This paper presents an overview of differences in basic repatriation policy and procedure at the National Museum of Natural History, the National Museum of the American Indian, The Peabody Museum, the Field Museum, and the Museum of New Mexico based on staff interviews at each institution.

Bawden, G. (see Trask, L.) [38]

Bayham, F. (see Broughton) [58]

Bayman, J. (see Fish, P.) [107]

Beaudry-Corbett, Marilyn (Institute of Archaeology, UCLA)

[53] HIERARCHICAL COMMUNITY ORGANIZATION, LATE FORMATIVE PACIFIC COASTAL GUATEMALA

Field investigations in the Tiquisate Archaeological Zone have expanded beyond the primary center of San Cabezas to incorporate excavations at a secondary center. Work in residential and public architecture at the two sites as well as survey between them provide data for developing a model of regional organization. Functional variations and differing construction histories (within each site; between the sites) are reviewed and integrated into the model. On-going analyses of food resource utilization provide another dimension for evaluating regional well being.

Beck, L. (see Sievert, A.) [37]

Beck, L. (see Schoeninger, M.) [102]

Beekman, Christopher and Stephen Houston (Vanderbilt)

[53] POLITICAL BOUNDARIES IN ANCIENT MESOAMERICA

The nature and detection of archaeological boundaries has long been a source of debate, related in part to interest in frontiers as zones of contention, interaction, and avoidance, or as regions of relative permeability. Political boundaries in particular reflect the internal structure of polities as well as the nature of external relations. This essay reviews political boundaries in Mesoamerica as these are

attested epigraphically, archaeologically, and ethnohistorically. We contrast the boundaries of "weak states", such as Maya kingdoms, with those of "strong states," including the Tarascan polity, showing how each leaves its signature on the landscape.

Begay, Richard and Alexa Roberts (Navajo Nation)

[103] EARLY NAVAJO OCCUPATION OF THE GRAND CANYON REGION

It is often assumed that Navajos moved into the western margins of Navajo land during the 19th century and used the Grand Canyon to escape from the United States Army during its campaign against Navajos in the 1860s. Archaeological data collected during investigations for the Navajo land claims before the Indian Claims Commission in the 1950s and 1960s, and oral history collected during the ongoing Glen Canyon Environmental Studies/Navajo Cultural Resources Project indicate that the Navajos' Athabaskan ancestors were using the Grand Canyon and surrounding region by the late 1600s. This paper summarizes the archaeological and ethnohistorical data supporting an early Navajo occupation of the Grand Canyon region and discusses implications for early Navajo migrations.

Bellelli, C. (see Klingman, D.) [36]

Benally, Larry and Alan Downer (Navajo Nation)

[86] THE TROUBLE WITH TRADITIONAL CULTURAL PROPERTIES: PRACTICAL CONSIDERATIONS OF MANAGING THE NAVAJO NATION'S MOST IMPORTANT CULTURAL RESOURCES

The Navajo Nation has been actively involved in managing and protecting "Traditional Cultural Properties" (TCP) since 1988. The publication of National Register Bulletin 38 has made consideration of TCPs a general issue in cultural resource management. Many archaeologists and cultural resource managers are deeply perplexed about how to deal with TCPs. The Navajo Nation's experience demonstrates that TCPs are not the PROBLEM. To demonstrate this, the policy issues pertaining to identification, evaluation and management of TCPs are examined from the perspective of the Navajo Nation. The practical concerns with applying these policies are detailed.

Benfer Jr., Robert (Missouri-Columbia)

[9] BIOARCHAEOLOGICAL TEST OF THE SELECTIONIST HYPOTHESES

The Darwinian concept of selection has been extended to artifactual variation, where changes in frequencies are explained as changes of an "extended" phenotype. Changes in skeletal health over time measure results of possible selective forces. Changes in life expectancies and population size alone can track absolute selection. Arguments must link indicators of health and population structure with changes in artifactual variation if selection is to be a useful tool for describing human adaptation from material remains. Temporal changes in ceremony, activity, and technology are linked to changes in health, fertility, and life expectancy among successive populations at the Preceramic site of Paloma, Perú.

Bengtsson, Lisbet (Illinois)

[48] CH'ULLPAS AT KACHIQHATA AND MARKAQOCHA, DISTRICT OF OLLANTAYTAMBO IN SOUTHERN PERU

A survey of ch'ullpas on the Kachiqhata slope in the vicinity of Ollantaytambo in the Cusco department was complemented by a survey of ch'ullpas by Markaqocha in the Patakancha gorge in the same district. Architectonical features such as shape, size, building materials and orientation were studied and surface finds such as bones and ceramics recorded. From the Kachiqhata chambers, samples were collected for dating purposes. The Kachiqhata ch'ullpas' relationship with the prehistoric stonework on that slope is also discussed. The results help to clarify characteristics and cultural belonging of a type of ch'ulla in the Central Andes.

Benn, David (Bear Creek Archaeology) [Discussant 43]

Bennett, Jack (Archaeological Assessments)

[92] A DECADE OF CONTRACT ARCHAEOLOGY FOR THE U.S. ARMY ENGINEER DISTRICT, LITTLE ROCK: A CONTRACTOR'S PERSPECTIVE

This video presentation chronicles the development and application of new technologies, methods, and theories from 1982-1992, a period when Archeological Assessments, Inc. served as the major provider of cultural resource management services to the Army Engineer District, Little Rock. During this period a new cultural resource management paradigm emerged. This shift from a "site-based" archaeology to a paradigm in which the archaeological record is understood as the sum total of human alterations to the landscape has important consequences for the ways in which researchers and federal land managers collect, interpret, and disseminate archaeological data.

Bense, Judith (West Florida)

[109] GAINING AND MAINTAINING LOCAL GOVERNMENT ARCHAEOLOGICAL POLICY IN PENSACOLA, FLORIDA

Pensacola is the oldest settlement in the U.S., but until 1981, its archaeological deposits were being destroyed at an alarming rate. In 1985, under public pressure, the city passed a local version of NHPA Section 106. Maintaining and enforcing this public policy has been surprisingly difficult. In general, elected officials and outside contractors support and comply with the ordinance. However, city management and staff constantly try to ignore the ordinance by planning construction and maintenance projects without going through the compliance process. Advocates of archaeology must continue to be "watch dogs" and force enforcement of the ordinance.

Berenguer, José (see Dillehay, T.) [73]

Bergman, Christopher (Northern Kentucky) John Doershuk and David Rue (3D/Environmental Services Inc.)

[40] THE PADULA SITE (36NM15): A MULTICOMPONENT LOCALITY IN THE MIDDLE DELAWARE RIVER VALLEY

The Padula site is a prehistoric multicomponent locality situated north of Easton, Pennsylvania. In 1991, Phase III excavations uncovered a series of occupations spanning the Late Paleo-Indian to Protohistoric Periods. The various cultural components represented are superimposed in a stratigraphically compressed, plowzone setting. The artifacts have been subjected to a variety of analytical techniques: 1) raw material sourcing; 2) examination of lithic reduction systems; 3) microwear analysis; 4) spatial analysis; and 5) regional inter-site comparisons. These techniques have allowed some components to be examined in isolation, thus, meaningful have been made regarding the activities undertaken during discrete occupational episodes.

Bernard-Shaw, M. (see Johnson, R.) [103]

Bettinger, Robert (California-Davis) [Discussant 58]

Bettinger, Robert (California-Davis)

[34] MEASURING HOLOCENE ADAPTIVE CHANGE IN THE WESTERN GREAT BASIN

Evidence for local prehistoric adaptive change is commonplace in the western Great Basin. In many localities, the long-term trend is toward systems that are spatially less extensive and economically more diverse and intensive. In subsistence, this is expressed more by change in mode and context of procurement and processing (i.e., subsistence technology) than in range of resources used, which remained relatively stable. Evolutionary ecology, via foraging theory, offers a rudimentary interpretive framework for understanding these large-scale, directional trends in subsistence technology. Culture transmission theory explicates in more detail the mechanisms through change was accomplished.

Bettis III, E. A. (see Mandel, R.) [43]

Bettis III, E. Arthur (Iowa Dept of Natural Resources)

[43] BURIED SITE POTENTIAL: DETERMINATION, EVALUATION, AND SUGGESTIONS FOR SAMPLING 108 CUBIC METERS

Landform-sediment assemblages (LSA) are associations of modern landforms and underlying sedimentary sequences that have predictable age relationships. LSA maps have been used in several archaeological geology studies to help explain the distribution of known archaeological deposits and to evaluate the potential for buried archaeological deposits. These studies have shown that enormous volumes of alluvium have potential to contain buried archaeological deposits. Examples from the Upper Midwest and Kentucky illustrate several factors important in evaluating the potential of alluvium to contain in situ archaeological deposits, and provide suggestions for reasoned approaches to sampling the deep surface.

Bettis III, E. A. (see Artz, J.) [36]

Bewley, Robert (Royal Commission on the Historical Monuments of England)

[32] AERIAL PHOTOGRAPHY AND ARCHAEOLOGICAL SURVEY IN BRITAIN

Aerial photography has been a powerful tool in archaeological survey and site identification for over fifty years in Britain and Europe. The Royal Commission has played a key role in aerial photography in the past twenty-five years and has now embarked on a program to create archaeological maps of the whole country using aerial photographs. This paper will explain the reasons behind this, the methodology to be used and the resources required to achieve it.

Bibb, Lisa (Southern Methodist)

[83] SOME THOUGHTS ON THEORETICAL CONTRIBUTIONS OF ARCHAEOLOGY IN THE SOUTHWESTERN U.S.

It is recognized that North American archaeology as a discipline has strong origins in the Southwest United States, but recent publications suggest that research in this area has stagnated as our

theoretical orientations have been unable to accommodate the large amounts of data being recovered. This claim will be investigated, beginning with the goals of the early SW archaeologists, through the most recent research projects. An attempt to identify both the recent theoretical and practical contributions will be made, as well as the Southwest's contribution to North American archaeology as a whole.

Bicho, Nuno (Museu Nacional De Arqueologia)

[111] HOW TWO KILOMETERS CAN MAKE A DIFFERENCE: A RAW MATERIAL STUDY OF EPIPALEOLITHIC ASSEMBLAGES FROM CENTRAL PORTUGAL

Raw material economy has been increasingly one of the research foci of the European Paleolithic. These studies, however tend to center around large scale movements of high quality chert. This study, on the contrary focuses on very small scale movements of chert quartz and quartzite and how only 2 kilometers can make a difference in raw material selection, acquisition and economy. The research is based on lithic assemblages dated to the Early Holocene from the Rio Maior area, central Portugal.

Bigelow, N. (see Hoffecker, J.) [19]

Bird, M. Catherine (Wisconsin-Milwaukee)

[96] CURRENT PERSPECTIVES: MISSISSIPPIAN RESEARCH IN NORTHERN ILLINOIS

The research presented attempts to resolve a longstanding culture history problem in northern Illinois, and examines the role of material culture in the maintenance of social boundaries. Previous research focused on mounds and centered on the Illinois River valley, rendering the data inadequate to explain the regional settlement system and social interactions. New data significantly expands the geographical extent of the Langford Tradition, adds upland settlements, increases the duration of the tradition, and facilitates the reconstruction of subsistence practices. The paper presented will evaluate Langford settlement system models and will attempt to discern the "rules" that generated the regional pattern.

Bishop, Jennifer and Marie Selvaggio (Rutgers)

[51] THE EFFECTS OF HAMMERSTONE AND ANVIL MATERIAL ON PERCUSSION MARK MORPHOLOGY

Percussion marks are pits and grooves inflicted on bone by a hammerstone and anvil. Percussion marks produced by a granitic hammerstone and anvil were described by Blumenschine and Selvaggio in 1988. Here we present the first description of the morphology of percussion marks produced experimentally by different lithic and non-lithic materials. Establishing the range of variation among percussion marks can expand the number of archaeological bone specimens directly attributable to hominid carcass processing.

Blades, Brooke (New York)

[65] LITHIC UTILIZATION AND THE ORGANIZATION OF MOBILITY IN EARLY UPPER PALEOLITHIC MORAVIA

Procurement distances for lithic raw materials in the Eastern Gravettian prior to the Last Glacial Maximum are often lengthy. Some Aurignacian sites in Moravia also contain assemblages largely composed of "exotic" lithics. Raw material proportions at the Aurignacian site of Tvarozna will be analyzed, and compared with summary data from Dolni Vestonice. Mobility strategies are inferred from the dominance of "exotic" materials and the extent to which those materials are utilized.

Blake, Michael, Brian Thom (British Columbia) and Gary Coupland (Toronto)

[11] BURIAL MOUND EXCAVATIONS AT THE SCOWLITZ SITE, BRITISH COLUMBIA

Excavations of two prehistoric earthen burial mounds at the Scowlitz site, located on the Fraser River in southwestern British Columbia, are reported. Few such mortuary sites remain in the Northwest Coast culture area and no definite burial mounds have been excavated by archaeologists in the past 50 years. We describe the Scowlitz site focusing on the 1992 excavations of two of the largest mounds at the site. The size of the mounds, their elaborate construction, and the rich offerings of copper and marine shell ornament with one of the individuals lead us to suggest that the site may have served as a chiefly center in prehistoric times.

Blanton, Richard (Purdue)

[21] SOCIAL INEQUALITY WITHIN HOUSEHOLDS

Based on cross-cultural data from peasant community studies, I identify the recurring dimensions of intra-household social inequality, and discuss the concomitant material variation, looking particularly at houses. I then relate variation in household social inequality to variation in the complexity

of symbol production (canonical communication). I conclude with comments about the nature of household inequality in the evolution of complex societies.

Bleed, Peter (Nebraska) and John Weymouth (Nebraska)

[4] A NICE PLACE TO LIVE AND WORK: COMMUNITY STRUCTURE AT YAGI

The Early Jomon community that was based at Yagi on the Pacific shores of the southwestern Hokkaido had access to a wide array of rich natural resources, but a limited number of spaces suitable for habitation. In addition to a distinctive cultural and ecofactual assemblages, these conditions impacted the distribution of features across the Yagi site. This paper discusses the structure of the Yagi site in light of the community's reconstructed subsistence technology and the results of both excavation and magnetic surveys.

Blitz, Jennifer (Wisconsin)

[81] SHIFTING DIETARY PATTERNS AT MONTE ALBAN: A PERSPECTIVE FROM BONE CHEMISTRY ANALYSES

Skeletal materials from the site of Monte Alban in the Valley of Oaxaca, Mexico, were analyzed for trace elements and stable isotopes to elucidate patterns of diet and social stratification of its population from BC500-1000AD. The data illustrate a shift in dietary variability over time reaching a peak of differentiation during the Classic Period. This peak is associated with a heightened degree of social stratification, whereby higher status individuals had more access to meat and other food resources than lower status individuals who had relatively restricted vegetarian diets.

Bluemker, James (Transco Energy)

[40] ARCHAEOLOGICAL RESEARCH IN THE DELAWARE RIVER VALLEY—A CONSUMER'S REPORT

A majority of the research presented in this session's papers has been funded by Transcontinental Gas Pipe Line Corporation, a natural gas transmission company. Like a majority of American consumers, Transco management has certain expectations about the product they are buying. These expectations are concerned primarily with how it affects the business operations of the company. Any other expectations are secondary. This paper will discuss these expectations and how they have, or have not been met by current research in the Delaware River Valley, and if not, how they might be improved.

Bock, J. (see Juell, K.) [7]

Boden, M. (see Juell, K.) [7]

Boisvert, Richard (New Hampshire) and Anthony Costine (Beloit)

[29] A GOOD DAY AT BLACK ROCK—RESOLVING THE SOURCE AND DISTRIBUTION OF SO-CALLED "ARGILLITE" IN NORTHERN NEW ENGLAND

Argillite is the term used for over two decades in northern New England to describe a fine grained, homogeneous, black material common to sites of nearly all eras. Detailed X-Ray Diffraction and X-Ray Fluorescence analysis has demonstrated the material is not argillite, but rather a volcanic stone from the Ossipee Mountains of central New Hampshire. The distribution of the material, temporally and spatially, is presented with a discussion of the implications for a re-evaluation of settlement and exchange systems of the region.

Bomba, P. (see Carstens, K.) [82]

Bonnichsen, Rob (Center for the Study of the First Americans)

[18] A 40,000-YEAR OLD HUMAN WORKED BISON BONE

In zone M, 40,000 BP, two fragments of a left humerus of Bison antiquus in association with four probable stove artifacts were uncovered in square S2E2, Pendejo Cave, New Mexico. Taphonomic study suggested the hypothesis that the bone was hammered, turned, and split by paleo-indians. This hypothesis was tested by comparing fresh bovine humeri similarly worked by hand-held hammer, split by rocks dropped three meters, and humeri stomped on and also with deer and elk humeri split by wolves. Examination and CAT-scan X-rays revealed the 40,000 BP specimen bore significant similarity only to the one worked by our technician and tends to confirm human modification.

Bonnier, Elisabeth (Rhode Island School of Design)

[48] ARCHITECTURE OF THE LIVING AND THE DEAD IN TANTAMAYO, PERU

The Late Intermediate Period architecture of Tantamayo is analyzed formally, functionally, and compared with that found at contemporary sites in the central Andes. Categories of construction: "domestic, mortuary, fortification, etc." are examined both in terms of regional morphologies and spatial distributions. It is postulated that a specific stratified social organization accounts for the

distinct urban planning and unique "skyscraper" buildings that characterize the Tantamayo zone and distinguish it from its neighbors.

Bonzani, R. (see Oyuela-Caycedo, A.) [104]

Bonzani, Renée, Augusto Oyeula-Caycedo (Pittsburg) and Jaime Castro (Universidad de Los Angeles, Bogotá, Colombia)

[93] TECHNOLOGY AND SUBSISTENCE: THE CASE OF A COLLECTOR POPULATION IN NORTHERN SOUTH AMERICA

This paper examines the subsistence activities of early formative populations in the north of Colombia from the perspective of lithic technology. As a case study the technologies associated with shell middens (Puerto Hormiga, Canapote, Barlovento) and the river delta site of Monsu are compared with the material recovered from the inland settlement of San Jacinto 1. San Jacinto 1 is the first archaic/formative site excavated systematically in this part of the continent. It dates between 5700-6000 B.P. A preliminary revision of early models of subsistence is presented.

Booth, D. (see Holley, G.) [106]

Borrero, L. (Connecticut) and Jose-Luis Lamata (Texas)

[27] RESOURCES EXPLOITATION IN SOUTH PATAGONIA DURING THE PLEISTOCENE-HOLOCENE TRANSITION

Traditional interpretations characterized of Late Pleistocene hunter-gatherer from South Patagonia as specialized megafaunal hunters. These were contrasted to the modern game hunters of the Holocene. This simplistic equation does not consider the diversity of ecosystems, chronological change and the biased sample of known archaeological sites. Recent research at new sites and the analysis from faunal collections of previous excavations, shows a distinct framework for resource exploitation during the Late Pleistocene-Early Holocene period.

Bostwick, Todd (Pueblo Grande Museum-Phoenix)

[107] AN EXAMINATION OF CRAFT PRODUCTION AT PUEBLA GRANDE, A HOHOKAM PLATFORM MOUND VILLAGE IN PHOENIX, ARIZONA

In the Phoenix Basin of Arizona, Hohokam platform mound villages are typically spaced about 5 km apart along the irrigation canals that allowed the Hohokam to farm vast amounts of agricultural land. The platform mound villages appear to have played a central role in the production and distribution of various craft goods, including textiles, ceramics, certain stone tools, and other items. This paper examines the evidence for craft production at the site of Pueblo Grande, which is located at the head of a major irrigation system and contains one of the largest platform mounds built by the Hohokam.

Botwick, Bradford and Robert Wall (Louis Berger Associates)

[40] PREHISTORIC SETTLEMENT IN THE UPPER DELAWARE VALLEY HIGHLANDS

A multi-year archaeological survey of selected portions of the Delaware Water Gap National Recreation Area has been partially completed. The survey focussed on upland locations. Settings predicted to be attractive locales for aboriginal settlement/land use included: swamp edges, ridgetops/overlooks, glacial till positions such as kame terraces, floodplain margins and footslopes, outcrops providing shelter or lithic raw material, pond/swamps, and stream-side environments. Thus far, sites have been located near swamps, headwater flats, mid-slope benches, high order stream settings and kame terraces.

Boucher, S. (see Kepecs, S.) [66]

Bove, Frederick (Calif-Santa Barbara)

[66] OBJECTIVES AND PRELIMINARY RESULTS OF THE LOS CHATOS-MANANTIAL PROJECT, ESCUINTLA, GUATEMALA

A debate continues in modern anthropology regarding early state evolution. Yet it is generally conceded that high quality relevant data pertaining to the emergence of early states in specific areas is scarce. A new exploratory project was begun in the 1991-92 field season to examine the origins of state evolution at the Los Chatos-Manantial nuclear zone. Objectives and preliminary results are presented.

Boyle, Katherine (Cambridge)

[89] RECOGNIZING DIFFERENCES IN ELEMENT REPRESENTATION PATTERNING

For some years now patterning in element representation has formed an important and growing part of faunal studies. Since the 1978 publication of Binford's 'Nunamuit Ethnoarchaeology', the methods of data calculation and presentation have remained much the same. Recent work on faunal

assemblages from Middle and Upper Paleolithic sites in Western Europe has used three methods and extensions thereof. In this paper an attempt is made to show that simple, alternative methods of result/data presentation can shed further light on such phenomena as (a) the existence of absence of chronological change in assemblage structure, (b) possible distinction between formation processes, and (c) differences in human activity associated patterning. All of these become clearer as more assemblages are considered simultaneously.

Boynner, Ran (UCLA) and Mathilde Temme (Ecuador)

[50] TEXTILE IMPRESSION FROM POTUSHIO, SOUTHERN ECUADOR: CULTURAL CONTINUITY?

The site of Potushio, in the southern Ecuadorian sierra, is located on a strategical hilltop overlooking the river fork of Rio Leon and Rio Ona. The site contains evidences mainly from the Formative, but also from the earlier Valdivia and the later Regional Developmental periods. Recent analysis of 56 ceramic pieces with textile impression from all periods in the site contributed to the formation of hypothesis regarding cultural change and continuity in Potushio. The results indicated similar production process in technique, material components and thread ratios throughout time; only decoration changed, hence it seems that only cultural affiliations might shifted while the local population remained the same.

Braun, D. (see Coppock, G.) [17]

Bray, Tamara (Smithsonian)

[20] ANDEAN-AMAZONIAN LINKAGES IN ECUADORIAN PREHISTORY: THE PIMAMPIRO CONNECTION

Located near one of a limited number of passes through the eastern cordillera of Ecuador, the Pimampiro district is described in sixteenth century sources as a gateway to the Oriente and an important multi-ethnic trade center. Pimampiro was also a renowned center of coca production during the late prehistoric period. The goal of the first season's fieldwork in this region was to archaeologically define the ethnohistorically described Pimampiro district. One of the most interesting finds of the season was a series of previously unrecorded stone-faced terraces located in the valley bottom. Pottery and carved motifs from one site in particular offer preliminary evidence of trans-oceanic contacts.

Brinker, Ruth (Monongahela National Forest)

[2] ROCKSHELTER SURVEY ON THE HOOSIER NATIONAL FOREST

In the summer of 1991, the Hoosier National Forest sponsored a Passport in Time project to assess an area geographically and geologically optimal for the formation of rock overhangs. Two National Register listed rockshelters are in the vicinity. Project goals were to locate and document important sites and to bring public attention to the need to protect the resources in the area. Nine volunteers spent a week of training and surveying approximately 200 acres of rugged terrain. The results added significant data to our knowledge of the area and are discussed in this paper.

Brockington, Donald (North Carolina) and David Pereira (Universidad Mayor de San Simón)

[73] RECENT RESEARCH IN CENTRAL, SOUTHERN AND TROPICAL BOLIVIA

Exclusive of the Lake Titicaca region, archaeological research in Bolivia over the last ten years has concentrated in the high valleys, Andean eastern slopes and eastern lowlands of the Department of Cochabamba. Most research focused on Formative Period traditions although advances were made in the study of later traditions. Almost all research had a culture history orientation. Recent findings will be summarized, some tentative hypotheses offered, and an assessment of the state of archaeological knowledge of southern Bolivia will be presented.

Brodebeck, Mark (Arizona)

[53] THE ECONOMIC VALUE OF PRISMATIC BLADES AND THE SOCIAL IMPORTANCE OF LITHIC ECONOMIES: A CASE STUDY FROM LA MIXTEQUILLA, VERACRUZ, MEXICO

The significance of lithic economies in subregional and regional social development in Mesoamerica has been the focus of considerable debate. In this paper, usewear data, sensitive to variable economizing use behavior, are used to assess the economic value of prismatic blades, and, in turn, the importance of lithic economies in regional social development. This study is focused on groups of households in La Mixtequilla, geographically and culturally defined Gulf Coast subregion in the modern state of Veracruz, Mexico.

Brooks, Robert (Oklahoma Archaeological Survey)

[112] "AIN'T NO PLACE QUITE LIKE THIS PLACE": THE CASE FOR SEDENTISM AMONG SOUTHERN PLAINS VILLAGERS

Conventional wisdom has Plains Village societies living in semisedentary communities with horticultural pursuits supplemented by communal bison hunting. However, correlates between historic

and prehistoric Plains societies have a number of problems. It is argued that prehistoric Plains peoples were more sedentary than previously realized. Six characteristic signatures of sedentism are used to examine this issue. Archaeological and bioarchaeological data are used to substantiate a case for an intensive sedentary way-of-life.

Broughton, Jack and Frank Bayham (Washington)

[58] RESOURCE INTENSIFICATION IN NORTHERN CALIFORNIA: PATTERNS IN ARCHAEOLOGICAL VERTEBRATE EVIDENCE

Analysis of archeofaunal assemblages from three environmentally distinct areas of northern California allows for an empirical determination of foraging efficiencies as a measure of resource intensification. Diachronic changes are monitored through the proportionate representation of large and small-sized taxa. The abundance of medium and large mammals decrease through time relative to small taxa. When seasonal and spatial variability are held constant, significant decreases also exist in the abundances of large anadromous fish relative to small resident fish and mollusks. These patterns tend to support models of resource intensification which posit a decline in foraging efficiency during the late Holocene.

Brown, Gary (Mariah Associates)

[103] CULTURAL AND TEMPORAL VARIABILITY DURING THE PROTOHISTORIC TRANSITION IN THE NORTHERN SAN JUAN REGION

Recent data have demonstrated considerable time depth and geographic variability in the protohistoric occupation of the northern San Juan region. Protohistoric time/space parameters need to be revised in order to incorporate new information on the early Athapaskan occupation. This paper indicates some directions that revisions can take to make the archaeological data more amenable to understanding the cultural affinity, origins, and dynamics of protohistoric populations in the northern San Juan region. The pivotal role of the Pueblo Revolt and subsequent Spanish Reconquest in Navajo cultural history is critically examined.

Brown, James (Northwestern)

[0] IS SPIRO CAHOKIA'S CADDOAN CONNECTION?

The Caddoan Area once was thought to be the bridgehead of Mesoamerican contact into the American Bottom. Recent work at Spiro and many other sites in the area have indicated a radically different relationship instead. Far from being a source of innovation, the culturally conservative peoples of the Caddoan Area (and the Arkansas River Basin in particular) mainly took their cultural cues from Cahokia and allied centers in the Mississippi Valley. The picture of subsistence, settlement and socio-political organization that is emerging from the various parts of the Caddoan Area underscores the uniqueness of developments toward complex society in the American Bottom.

Brown, James (Northwestern)

[59] FEASTS AND FAIRS: THOUGHTS ON THE ECONOMICS OF HOPEWELLIAN INTERACTION

The spectacle of widespread trade is commonly conjured up by the lists of farflung sources for exotic artifacts found in Hopewellian graves, deposits and certain structures. Although down-the-line trade is widely thought to be responsible for exotic assemblages, the time has come to review alternative models and to assess their relative explanatory power. Principal among these alternatives is the movement of people rather than objects to locations. This and other alternative models for the transport of exotics have strong implications about the relative complexity involved in the Hopewellian "earthwork culture."

Brown, James (Northwestern) [Discussant 43]

Brown, K. (see Carstens, K.) [82]

Bruhns, Karen (San Francisco) and James Burton (Wisconsin-Madison)

[20] HIGHLAND-LOWLAND LINKAGES IN FIRST MILLENIUM BC ECUADOR

Archaeological investigations in the southern highlands of Ecuador have revealed a 1000 year history of exchange between the inhabitants of the highland valleys and the adjacent montana. Petrographic analyses of ceramics show a complex web of interaction between different communities as well as providing a much needed check on interpretive schemes based solely upon stylistic features.

Bruhy, Mark (USDA Forest Serv-Nicolet Nat Forest)

[2] COPPER USE AMONG WOODLAND TRADITION PEOPLE AS EVIDENCED THROUGH EXCAVATIONS AT THE HEMLOCK CATHEDRAL SITE, FOREST COUNTY, WISCONSIN

The northern shore of Butternut Lake was the focus of an archaeological study conducted in 1991 and 1992. Initially, research was directed at determining spatial distribution, temporal provenience

and site function through examination of archaeological deposits first discovered through the recovery of a small amount of lithic debitage. Excavation resumed in 1992 to clarify the cultural affiliation and temporal parameters of a copper tool industry discovered here the previous year. This study serves to support the supposition that northern Wisconsin's Initial Woodland populations practiced a copper tool technology almost indistinguishable from that of earlier Archaic Tradition peoples.

Brunson, Judy (Salt River Project)

[23] TRADITIONAL CULTURAL PROPERTIES: COPING MECHANISMS FOR THE PRIVATE DEVELOPER

Traditional cultural properties are a hot topic among agencies and tribes. Opinions abound on how TCPs fit within the compliance process, or if they even need to be done. Private firms are having to produce their own strategies for working with tribes on TCP matters and are handicapped by confusing guidelines and no existing regulations. Strategies from the proposed Salt River Project Fence Lake Coal Mine project are offered as a possible model for large-scale projects, followed by a discussion of one utility's viewpoint on what the federal agencies and tribes should be doing to help with TCP issues.

Bryant, Jr., Vaughn (Texas A&M)

[8] CALLEN'S LEGACY

The study of human coprolites, as a recognized subdiscipline of science, is barely more than 30 years old. Its founder, Dr. Eric O. Callen, died more than 20 years ago yet he worked with an almost missionary zeal to convince archaeologists, botanists, zooarchaeologists, and anyone else who would listen, of the importance of prehistoric human fecal research. Thus, it is fitting to look back at the Callen Era and to try to unravel how the discipline began, how it progressed during Callen's lifetime, and what advances have been made in coprolite research during the more than two decades since his death. Even more important, perhaps, is a look into the future to see where coprolite research seems to be headed.

Bulkstra, J. (see Lozada, M.) [9]

Burch Jr., Ernest

[46] THE DIHAI KUTCHIN: MYSTERY PEOPLE OF NORTHERN ALASKA

The Dihai were a Kutchin-speaking people who inhabited the central Brooks Range in northern Alaska in the early 1800s. They were defeated and nearly exterminated by Inupiat Eskimos in a series of battles around mid-century. The survivors fled and merged with the Chandalar Kutchin. The Dihai were never seen in their homeland by a single Euroamerican, and information about them is fragmentary. In this paper I integrate new data with what was previously reported. The result may be the final chapter in the ethnography of this mysterious people.

Burger, Richard (Yale) [Discussant 9]

Burton, J. (see Bruhns, K.) [20]

Burton, J. (see Duff, A.) [83]

Butler, Virginia (Colorado)

[70] THE EFFECTS OF PREHISTORIC HUMAN PREDATION AND HABITAT ALTERATION ON FISH POPULATIONS IN MANGAIA, COOK ISLANDS, POLYNESIA

Although it is generally accepted that humans colonizing South Pacific islands profoundly affected vegetation, avifauna, and invertebrates, the case for human-induced effects on fishes is less clear. Fish remains from Tangatatau Rockshelter [MAN-44], Mangaia, Cook Islands, were analyzed in order to track direct and indirect effects of human predation and environmental degradation on nearshore marine and freshwater fish populations. Temporal changes in reconstructed body size of three taxa (labrids, cirrhitids, eleotrids) suggests variable responses to predation pressure. Effects of agricultural intensification on sedimentation of freshwater habitats are reviewed.

Byers, A. Martin (Vanier)

[59] THE PURSUIT OF REPUTATION AND THE ARCHAEOLOGY OF THE HEROIC: THE HOPEWELL AS HISTORIC EPISODE

A symbolic interpretation of the archaeological record based on an action-constitutive view of material cultural meaning is applied to the Ohio Hopewell embankment earthworks and their associated civic-cult constructions. A theoretical contrast, the heroic/mundane duality, is used to interpret the archaeological record of interaction spheres in terms of the intersection of the pursuits of reputation and survival. Interpretive focus is given to the role of the material media of the heroic pursuit

of reputation and honor, e.g., monumental structures and ceremonial contexts, which ground the historical aspect of the interaction sphere.

Calderari, Milena (Universidad de Buenos Aires)

[105] INKA PERIOD CERAMIC STYLES OF THE CALCHAQUI VALLEY

Easily recognized, Inka ceramic styles have generally been a good indicator of Inka occupation. Problems arose in northwest Argentina when archaeologists realized the Cisco-manufactured or imitation styles were present in low probability in comparison to local styles. This led to establishment of four pottery categories differing in production, morphology, design repertoire, and iconography: Imperial or Caman Inka, Provincial Inka, Wari Inka, and Inka Plain. These provide information on their manufacturer's ethnic affiliation. The co-existence of several ceramic styles in the Calchaquí Valley sheds light on production, exchange, and consumption patterns of the archaeological sites' temporary and permanent inhabitants.

Cameron, Catherine (Advisory Council on Historic Preservation)

[83] THE COLLAPSE OF THE CHACOAN SYSTEM: FRAGMENTATION AND SOCIAL REORGANIZATION IN THE AMERICAN SOUTHWEST

From the 10th to the 12th centuries A.D., Chaco Canyon in northwest New Mexico, was the center of a regional system that covered a large portion of the Colorado Plateau. The system came to an end by about A.D. 1150, but before it collapsed, during the late 11th and early 12th centuries, there appears to have been dramatic changes in the use of structures in Chaco Canyon and a major reorganization of the regional system. Examination of these changes, set against current theories of how the system functioned, shed light on the process of fragmentation in this non-state society.

Carpagne, C. (see Carpenter, M.) [94]

Campana, Douglas (New York)

[89] MIDDLE PALEOLITHIC BUTCHERY AT SHANIDAR CAVE

The Middle Paleolithic levels of Shanidar Cave (Layer D), excavated by Ralph S. Solecki, contained the skeletons of nine Neanderthal individuals, a large Mousterian lithic assemblage, and a substantial collection of animal bones. Although the animal bones were identified, the butchery had not been studied in detail. An examination of the cut-marks suggests that the lower limb elements of wild goat (*Capra aegagrus*), the most commonly found species, served either as a source of tendons or carefully skinned pelts. These possibilities suggest that the Shanidar Neanderthals possessed a more complex material culture than that indicated by the lithics alone.

Cande, Kathleen (Arkansas Archaeological Survey)

[10] THE MENARD-HODGES SITE, ARKANSAS REVISITED: CERAMICS FROM THE VILLAGE OF OSOTOUY

Collections made at the Menard-Hodges Site, Arkansas (a National Historic Landmark) and related sites by Preston Holder of Washington University in 1956 and 1957 have been inventoried and catalogued with funding from the National Park Service. The results of this study, along with examination of field notes and photographs add to the growing database on the Menard complex and to the debate as to the ethnic affiliation of the inhabitants of the village of Osotouy.

Canouts, Veletta (National Park Service) [Discussant 44]

Canouts, Veletta (National Park Service)

[80] STYLISTIC INDICATORS OF SOCIAL DIFFERENTIATION: WHOLE VESSEL ANALYSIS OF RITUAL WARE FROM WESTERN NEW YORK

Excavations conducted at the Ripley site between 1904 and the mid 1960s yielded over 150 whole ceramic vessels. This site is one of the remaining earthwork sites in western New York, and recent re-excavation and re-evaluation of the site suggests that it may have been a mortuary encampment rather than a fortified village with a resident cemetery. The rim band designs which may indicate intersite interaction, while diverse, do show structural similarities. The discussion focuses on the interrelationship of the pottery types, structural similarities, and variable design configurations which may reflect formal technical and conceptual differences between social groups.

Cantley, Gary (Bureau of Indian Affairs)

[35] ARCHAEOLOGY AT A ROCKPILE FIELD IN CENTRAL ARIZONA

This paper proposes a model of rockpile construction in the Hohokam culture area. A rockpile field in the Santan Mountains of central Arizona was the focus of an investigation that lead to creation of the model. A major feature of the model is that rockpiles were built for purposes of plant cultivation.

Carlson, Roy (Simon Fraser)

[58] EVOLUTION OF THE NORTHWEST COAST CULTURAL SYSTEM

Affluent collectors of the Northwest Coast evolved from a foraging pattern of sub-arctic colonizers. This evolution appears in the following sequence (early to late): 1. Adaptation to salt water and lower river valleys. 2. local trade: spirit power beliefs. 3. intensification of fishing. 4. preservation, storage and dependency on salmon; population growth. 5. Social differentiation; interregional trade; paleo-potlatch; craft specialization in wood working and sculpture; shamanism; 6. social ranking; potlatch. 7. Raiding and slavery; population stabilization; and 8. 1492-1792, introduced diseases and population decline.

Carmichael, David (Texas—El Paso)

[3] DESECRATION OF HOPI SACRED SITES IN NAVAJO-PARTITIONED LANDS

There has been increasing interest in involving Native Americans in the identification and management of traditional cultural properties such as sacred sites. Threats to such sites are usually viewed as coming from development projects; it has generally not been recognized that Native American sacred sites can be threatened by the actions of other tribal groups. This paper discusses several Hopi sacred sites that have been desecrated by ongoing activities in Navajo-partitioned lands near the Hopi reservation in northeastern Arizona. Implications of these cases for the preservation ethic and for implementation of federal preservation laws are considered.

Carpenter, Maureen (Sonoma State) and Curtis Campagne (Denver)

[94] MAYA ELITE USE OF OBSIDIAN AT CARACOL

During the 1992 season, several tombs of differing economic status were excavated. The resulting data shows an extensive use of prismatic blades and an exceptional assortment of eccentrics and exotics. These burials provide an excellent illustration of the variable access to wealth and resources. The obsidian mortuary goods are making a clear statement of conspicuous consumption, revealing through such 'waste of wealth', the socioeconomic 'wealth of waste'.

Carr, Philip and Walter Klippel (Tennessee)

[112] FORAGERS AND COLLECTORS AS TWO EXTREMES: WHAT LIES BETWEEN THE CONTINUUM?

The Forager-Collector Model is commonly used in the reconstruction of prehistoric hunter-gatherer land-use. It is often noted that foragers and collectors represent two extremes on a continuum. However, what lies between these two extremes has seldom been explored. In this paper, the middle ground between foragers and collectors is investigated. In many prehistoric environments, this middle ground may represent a more common set of strategies than generally recognized by archaeologists. The Middle Archaic occupation of the Hayes Site (40ML139) is offered as one possible example of a prehistoric group employing a middle strategy as opposed to one of the two extremes.

Carroll, Charles (Bureau of Land Management)

[23] PRACTICAL PROCESSES AND PARADOXES IN ADMINISTERING FEDERAL LAWS AND REGULATIONS RELATING TO NATIVE AMERICANS

Recent federal laws and regulations concerning Native American issues have vastly increased demands upon tribal infrastructures, federal agencies, private industry, and archeologists. Independent federal laws with the same general goal—consideration of Native American concerns are triggered at successive and not always compatible points in federal undertakings. This results in a complex matrix of consultations which are sometimes redundant, involving meetings, field surveys, review of extensive technical documents, and detailed written communication between tribes and agencies, which is rapidly overwhelming the administrative capabilities of all parties. An integrated approach is suggested.

Carstens, Kenneth (Murray) Pat Bomba and Kristen Brown

[82] A CARTOGRAPHIC GISFOR THE FORT JEFFERSON ARCHAEOLOGICAL RESEARCH AREA

Through interdisciplinary efforts, a Geographic Information System (GIS) was established for the Fort Jefferson archeological research area. The study area is located in extreme western Kentucky and represents the presumed location of a late 18th century military and civilian occupation. The GIS consists primarily of a cartographic sequence all sharing the same scale and orientation. The results of this cartographic GIS indicates new areas for archaeological testing in an attempt to locate this very significant site.

Carucci, James (Southern Illinois)

[39] NONCULTURAL SHELLS IN CULTURAL MIDDENS: PROCESS AND INTERPRETATION

Marine shellfish remains generally comprise the most common component of archaeological midden deposits in Micronesia. Analyses of these faunal shell assemblages usually ignore important

signature patterns which derive from natural, noncultural, marine processes. Evidence of crab predation, especially, affects the overall characterization of a shell assemblage; not all mollusks represent human food refuse.

This paper considers three common causes of shell biomodification: predatory crabs, predatory gastropods, and hermit crabs. The identification and interpretation of natural signature patterns associated with these organisms is illustrated using shell data from Palau and the Mariana Islands. The consequences of ignoring these signatures is discussed.

Castillo, A. (see Kepcs, S.) [66]

Castro, J. (see Bonzani, R.) [93]

Castro, J. (see Oyvella-Caycedo, A.J) [104]

Cavallo, John (Rutgers)

[40] ANIMAL BIOLOGY AND BEHAVIOR AS INDICATORS OF ARCHAEOLOGICAL SITE FUNCTION

Many studies of prehistoric Native American hunters and fishers in the Northeast have focused on the cultural geography of these peoples to the exclusion of the niche geography of their prey. Local edaphic factors and inventories of preserved faunal remains are frequently used to generate models of resource scheduling and A5 indicators of archaeological site function without consideration for the behavior and ecology of these species nor the taphonomy of their remains. This paper discusses how biologically-based studies of the behavior and ecology of deer and anadromous fish, in conjunction with taphonomic and archaeological data, were used to understand the placement and function of two archaeological site complexes in the Delaware River Valley and generate more realistic models of prehistoric human subsistence and settlement in the Delaware River Valley.

Champion, Timothy (Southampton)

[59] FOOD AND METAL: SOCIAL COMPLEXITY IN SOUTHEASTERN ENGLAND 1000-700 B.C.

The Late Bronze Age of western Europe (1200-700 BC) is generally presented as a period of increasing social complexity, with particular emphasis on agricultural intensification and the production and circulation of prestige goods. Despite widespread homogeneity of material culture and technology, there was considerable regional variation in social organization. Recent excavations of settlements in southeastern England have produced the first good evidence for domestic architecture and the patterning of material culture deposition. This evidence suggests that the relationship between material culture and social organization is more complicated than hitherto appreciated, and makes problematic the ascription of degrees of social complexity.

Chang, Claudia (Sweet Briar)

[56] NEW DIRECTIONS IN SETTLEMENT PATTERN STUDIES: AN ETHNOARCHAEOLOGICAL PERSPECTIVE

Settlement pattern studies in archaeology are based on geographical and ecological models. In the 1960s settlement archaeology often relied upon taxonomies of ideal site types which represented behavioral units of human spatial organization. The distribution of archaeological places in pastoral and agricultural systems across contemporary landscapes do not conform to site type taxonomies nor can they be explained only through traditional models of settlement. Ethnoarchaeology provides some new directions for examining different scales of spatial distributions across landscapes.

Chase, Arlen (Central Florida)

[75] POLITIES, POLITICS, AND SOCIAL DYNAMICS: THE BELIZE VALLEY AND CARACOL

Considerations of Classic Maya polities are often limited to epigraphic studies or settlement hierarchies that apply models borrowed from geography or based on volumetrics. Yet, other kinds of archaeological data can be used to answer questions of political hierarchy, polity size, and social dynamics. The conjunction of archaeological data from the Belize Valley and Caracol (its powerful neighbor to the south) permit both the generation of alternative archaeological models for the interpretation of polities and political boundaries and a consideration of the changing nature of these units over time.

Chase, Diane [Discussant 75]

Chatters, James

[58] BISON, SALMON, PRODUCTIVITY, AND THE DEVELOPMENT OF SOUTHERN PLATEAU SETTLEMENT SYSTEMS

Expansion of bunchgrass steppes and associated increase in bison and elk populations triggered an increase in upland activity in the Southern Plateau ca. 2500 B.P. Archaeological, paleohydrological

and paleoecological data show the expansion of grassland would have resulted in higher ungulate biomass, and paleohydrological indicators for the same period show conditions detrimental to salmon productivity. Between 2500 and 1800 B.P. the river resources were reduced while the upland resources increased supporting an increased use of uplands. These changes were partially reversed after 1900 B.P. but use of the uplands continued until historical times as part of Kroeber's "Plateau Culture".

Chenault, Mark (SWCA) and Kirk Anderson

[107] THE MICROARCHAEOLOGY OF HOHOKAM FLOORS

Two pre-Classic Hohokam pit house floors are systematically sampled for the recovery of embedded microartifacts. This technique circumvents many of the adverse effects of formation processes. Distributions and types of microartifacts indicate the presence of activity areas, with substantial overlap in different activities. Also, analysis of petrographic thin sections of the plastered floors provides information on floor construction and use-life. Interpretations of structure function are made based on the results of this sampling program.

Chippindale, Christopher [Discussant 16]

Chisolm, Brian (British Columbia)

[4] INLAND/COASTAL LINKS AS SEEN FROM ISOTOPIC ANALYSIS OF JAPANESE PREHISTORIC HUMAN BURIALS

Isotopic data obtained from Jomon Period human burials reveal diet differences between populations living in coastal and inland locales near each other, and indicate differences in resource exploitation. In some cases people who live in coastal sites appear to have relied more heavily on inland resources than was previously presumed. Differing isotope ratios for males and females in some sites indicate possible differences in subsistence role. Yayoi Period burial results indicate that the differences in diet, and hence in resource exploitation, had disappeared, and that diet had become more homogeneous throughout much of Japan.

Chrisman, Donald (Andover Foundation for Archaeological Research)

[18] PENDEJO CAVE PRE-CLOVIS WORKED BONE AND TOOLS—MAKE NO BONES ABOUT IT!

We found a fractured first phalanx of an extinct horse (zone K, carbon-dated 36,000 BP). X-rays showed a dense pointed object buried in the bone. Using computerized tomography (CAT-scans), a very accurate non-invasive technique, we found the object was not stone, but a 4.5 cm segment of a round medium-sized mammalian long bone, beveled to a point and exhibiting many superficial grooves directed toward the point. No evidence of intrinsic bone pathology (excepting fractures) was seen. After much consulting, we concluded that the inner bone was the broken tip of a humanly modified bone tool, such as a spear or awl, which had been sharpened to a point.

Church, Warren (Yale)

[20] EVIDENCE FOR PREHISTORIC HIGHLAND-TROPICAL FOREST INTERACTION FROM MANACHAQUI CAVE IN THE NORTHEASTERN ANDES OF PERU: PRELIMINARY REPORT

Recent excavations at Manachaqui Cave (3,650 m) located beside a prehispanic road at the highland-tropical forest ecotone rendered a ceramic sequence beginning with the Initial Period. Ceramic remains include previously undocumented styles developed locally within the montane forest, and non-local styles intrusive from the highlands, eastern lowlands and southern Ecuador. The quality of sherds of non-local origin increases through time and peaks during the Early Intermediate Period and Late Horizon when it is likely that upper montane forest populations systematically mediated long-distance exchange between Andean and Amazonian societies.

Ciolek-Torrello, R. (see Homburg, J.) [107]

Claassen, Cheryl (Appalachian State)

[89] USING SHELL FRAGMENTATION TO IDENTIFY SURFACES FROM DOGAN POINT

Shell fragmentation is high in paths and other areas of traffic. At the Dogan Point oyster shell midden shell from 16 column sample levels was passed through $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{8}$ " mesh screens with the contents of each screen weighed. These proportions are being treated as potentially useful for assigning a level to and origin either "inside shell deposit" or "surface of shell deposit." Levels designed as potential surfaces are then examined for fragmentation in other classes of remains.

Clark, Donald (Canadian Museum of Civilization)

[46] ARCHAEOLOGY OF THE BATZA TÉNA OBSIDIAN SOURCE, ALASKA

A major obsidian source is located adjacent to the Koyukuk River, NW Alaska, in an area known to local Athabaskans as Batza Tena (Obsidian Trail). At numerous flaking stations, found within a

few km of the geologic source, obsidian was reduced to biface roughouts and made into other tools. Several sites have yielded assemblages representing a broader range of activity than lithic reduction and may be regarded as camp sites. The tentative sequence, based primarily on typological comparisons, includes an apparent fluted-point Paleoindian occupation.

Clark, J. (see Craig, D.J.) [83]

Clark, John (Bringham Young) and Dennis Gosser

[104] REINVENTING MESOAMERICA'S FIRST POTTERY

The first ceramics in Mesoamerica have been explained in terms of local ecological processes of adaptation, with ceramics becoming increasingly sophisticated through time. The earliest ceramics from the southern coast of Mexico and Guatemala, however, are highly sophisticated, suggesting that the ecological model may be untenable for some regions of Mesoamerica. We address at least two models for the spread of ceramic technology in Mesoamerica. Adoption of ceramic technology in the highlands may have been motivated by utilitarian considerations. Ceramic technology in the coastal lowlands appears to have been adopted for political and social reasons.

Clothes, Jean (Min De L'Education National et de la Culture)

[25] ART OF THE LIGHT AND ART OF THE DEPTHS

Only in Western Europe during the Late Pleistocene is there a number of caves with rock art very far from the cave entrances. This art of the depths coexists with shelters decorated in the daylight and inhabited. This paper will explore the particularities of both sorts of locations and the assumptions that can be made about their role (s).

Cobb, C. (see Stephens, J.) [82]

Cogswell, James (Missouri)

[47] AN ANALYSIS OF SHELL-TEMPERED POTTERY REPLICATES: IMPLICATIONS FOR PROVENIENCE STUDIES

Element-based provenience studies of Mississippian pottery are complicated by the fact that the pottery was tempered with crushed shell in variable amounts. Differential post-depositional leaching of the shell further compounds the problem. Experiments conducted at the University of Missouri Research Reactor document the elemental dilution and enhancement effects of adding shell temper to clay. Results of physical, chemical, and mathematical attempts to eliminate the effects of shell tempering will be presented.

Collins, James (Iowa Office of the State Archaeologist)

[42] CAHOKIA SETTLEMENT AND SOCIAL STRUCTURES AS VIEWED FROM THE ICT-II

Excavation of .52 ha immediately outside the Cahokia Central Ceremonial Precinct in the mid-1980s provides abundant information relevant to the settlement and social dynamics that mark the rise and fall of the Cahokia polity. The way the Lohmann, Stirling, and Moorehead phase inhabitants of the ICT-II arranged themselves on the landscape reflects varying degrees of bureaucratic control and social distance between the Cahokia elite and the local community. A discussion of household management, demographic trends, and social constructs is based on data from over 500 features, including more than 70 domestic structures inferred to represent 18 individual households.

Collins, M. (see Takac, P.) [28]

Condon, Peter (Berger Associates)

[17] TECHNOLOGICAL ANALYSIS OF LITHIC ASSEMBLAGES AT TWO EARLY WOODLAND SITES IN THE SUSQUEHANNA RIVER VALLEY

The Meadowood Phase of the early Woodland in the Central Susquehanna River Valley can be viewed as representing a transitional period between the previous Broadspear Phase and the latter Woodland periods. The Early Woodland lithic assemblages at two Meadowood Phase sites along the Susquehanna River are analyzed within this framework. Production technology and material preferences are investigated and compared with earlier and later trends. The role of lithic technology in the overall subsistence strategy of the Early Woodland is explored.

Conkey, Margaret (California-Berkeley)

[25] ON DEFINING "CONTEXT": INTERPRETING THE MAGDALENIAN ART OF THE FRENCH PYRENEES

If the questions about "why art" are now more local, historical, and contextual, then we need to be explicit about what we mean by each term. Most archaeologists claim that they always consider the "context", but this is not a fixed concept- rather the contexts we assume to be relevant are constructed and variable. This paper explores the multiple significations of the term "context" in

particular reference to the art of the Magdalenian period in the French Midi-Pyrenees, which exhibit distinct regionalism, is abundant, and associated with sites dating after 15,000 B. P.

Conlon, James (London)

[75] THE EVOLUTION OF THE BEDRAN GROUP: A CLASSIC PERIOD SETTLEMENT CLUSTER AT BAKING POT

A brief overview of previous settlement research in the Belize Valley provides the introduction to the objectives of recent excavations at a settlement cluster at Baking Pot, Belize. Data retrieved from these investigations are presented in order to examine group morphology with regards to chronological development. Community organization is discussed in terms of settlement hierarchy.

Connolly, Marjorie (Crow Canyon Archaeological Center) [Discussant 44]

Conrad, Geoffrey (Mathers Museum, Indiana)

[85] THE FAR SOUTH COAST OF PERU: LANNING PLUS 25

Twenty-five years ago the prehistory of the Far South Coast of Peru was poorly known and seemed to be of marginal significance in Andean civilization. In 1967-68, however, Edward Lanning's *Peru Before the Incas* and John Murra's "An Aymara Kingdom in 1567" identified two key issues in regional prehistory: the relationship between Wari and Tiwanaku and the question of colonization from the Titicaca Basin. This paper discusses the progress made in understanding these issues since 1967- and the importance of the Far South Coast in Andean prehistory.

Cook, John and Michael Kunz (Bureau of Land Management)

[46] BATZA TÉNA OBSIDIAN: ITS IDENTIFICATION AND DISTRIBUTION

Previous studies have shown that obsidian from this source has the widest distribution and was the most frequently used of the many kinds of obsidian found at archaeological sites in Alaska. Using Instrumental Neutron Activation Analysis (INAA), X-ray fluorescence (XRF), and microprobe analysis (EDS), more than 900 samples of obsidian have been analyzed for elemental composition. More than 100 of these are from the main Batza Tena source in west central Alaska. The statistical results of these analyses will be compared and the distinguishing signatures of the obsidians, particularly that of the Batza Tena material, will be identified.

Cooke, R. (see Ranere, A.) [93]

Cooke, Richard (Smithsonian Tropical Research Institute)

[93] ACTUALISTIC STUDIES OF FISH MOVEMENTS IN THE MIDDLE AND UPPER ESTUARIES OF A PANAMANIAN PACIFIC COAST EMBAYMENT: RELEVANCE TO PRECOLUMBIAN FISHING PRACTICES

Interpreting archaeichthyofaunas from tropical eastern Pacific estuaries is complicated by speciose and ecologically diverse families, deficient zoogeographical knowledge and few data on how individual fish taxa behave within the biome. In order to determine which marine fish species move into turbid inlets and freshwater "upper" estuaries, I am quantifying various kinds of artisanal and experimental capture methods. I present an evaluation of the first year' data and compare them with Panamanian and Costa Rican Pacific coast dietary fish faunas.

Coppock, Gary (Archaeology and History Consultants) Duane Braun (Bloomsburg) and Jonathon Pollack (Geo Decisions, Inc.)

[17] ISLAND GEOMORPHOLOGY WITHIN THE MAIN STEM SUSQUEHANNA RIVER AND ITS IMPLICATIONS FOR THE OCCURRENCE OF DEEPLY BURIED ARCHAEOLOGICAL SITES

Soils investigations conducted as part of a Phase I archaeological survey suggest that large islands within the Main Stem Susquehanna River are older than previously thought. This study found that a thin mantle of Holocene aged alluvium that contained stratified Late Archaic and Woodland components occurred over a core of ancient alluvium that was deposited more than 50,000 B.P. The antiquity of the island core limits the potential for large islands of the Main Stem Susquehanna River to contain deeply buried prehistoric archaeological sites.

Cordell, Linda (California Academy of Sciences) [Discussant 41]

Cornejo, L. (see Simonetti, J.) [45]

Corney, Mark (Royal Commission on Historical Monuments of England)

[32] SURVEY AND RECORDING OF ANCIENT LANDSCAPES: A BRITISH AND EUROPEAN PERSPECTIVE

Following an introduction outlining the development of field survey in Britain, this proposed paper will examine the wide range of methodologies employed by RCHME to record and analyze ancient

landscapes. Particular emphasis will be placed on the integrated approach adopted which demands close co-operation between ground and aerial survey techniques, [in particular the use of a Total Stations system and computer aided AP plotting methods]. Further consideration will be given to the contribution of geophysics to enhance the archaeological record and of geomorphological investigation to broaden the topographic base.

The prime example of this approach will be the current work on the Salisbury Plain Training Area, where all the methods outlined are being employed to map a relict prehistoric and later landscape covering an area of 95000 acres.

The experience of such approaches is being employed by some RCHME staff elsewhere in Europe and illustrations from Provence to Hungary by way of Crete will be given. The Mediterranean sites are of particular interest as it has been demonstrated that analytical earthwork survey can produce meaningful results in semi-arid regions.

Corona, R. (see Simmons, A.) [64]

Costine, A. (see Boisvert, R.) [29]

Cotter, John (Pennsylvania)

[63] ARCHAEOLOGY AND NATIONAL ICONS

Every country has its icons which embody national identity. The National Park Service has a number of sites which conserve and interpret aspects of national image designated worthy of preservation for U.S. citizens in perpetuity by act of Congress or presidential proclamation. Many of these icons are archaeological. With the rapidly evolving interpretation of archaeological evidence and the use of archaeological sites in the field and as museum displays, a new challenge is to make these icons more meaningful. Some concepts and ways are considered.

Coupland, G. (see Blake, M.) [11]

Courty, Marie-Agnès (C.N.R.S.)

[78] THE MICROMORPHOLOGY OF ABRUPT CLIMATIC CHANGE

Sequential pedostratigraphic deposits from archaeological sites in northern Mesopotamia, securely dated by ceramic relative chronology and AMS radiometry, provide for micromorphological analysis of abrupt wind, temperature and humidity alterations in association with abandonment of sedentary urban settlements. Micromorphological data from other contexts are contrasted with these data, and new agendas for climatological research are proposed.

Cowan, Frank (Buffalo)

[52] HOPEWELL 'TRANSACTION CENTERS' REVISITED: THE MOUND HOUSE CASE

Two decades ago, Struve and Houart hypothesized that large, mounded Middle Woodland sites located along major river corridors were used to facilitate regional and Inter-regional trade and to promote the ideological communication that characterized the 'Hopewell Interaction Sphere.' The Mound House site in the lower Illinois River valley played a key role in the formulation of this 'transaction center' hypothesis. Current investigations are aimed at elucidating the roles that Mound House played in regional Middle Woodland societies. Present research indicates that while Mound House contains a ritual component, intensive trade relationships are not evident.

Cowan, C. Wesley (Cincinnati Museum of Natural History)

[91] COBWEBS, BACKDIRT AND PAYDIRT: RECENT RESEARCH AT THE MADISONVILLE SITE

This paper provides a historical overview of the discovery, excavation, and recent research conducted at the Madisonville site in Hamilton County, Ohio. It summarizes current knowledge about the chronological placement of the site, its importance as a source of information about the protohistoric occupation of the Central Ohio Valley, and provides as basis for understanding, the remaining papers in the symposium.

Cowan, C. Wesley (Cincinnati Museum of Natural History) [Concluding Remarks 91]

Craig, Douglas (Desert Archaeology), James Holmlund (Geo-Map, Inc.) and Jeffrey Clark (Desert Archaeology)

[83] LABOR AND ORGANIZATIONAL CONSIDERATIONS IN PLATFORM MOUND CONSTRUCTION: A CASE STUDY FROM THE TONTO BASIN OF CENTRAL ARIZONA

Southwestern archaeologists have long recognized the considerable amount of labor and organizational skill that went into constructing platform mounds. But attempts to specify these behavioral dimensions have generally met with failure, either due to a lack of data or because researchers have been unable to place mound construction within a larger social context. Recent excavations at the

Meddler Point site provide important new data for addressing these issues. The results of the Meddler excavations are discussed, and a preliminary model of community growth and development is presented. Included within this model is a consideration of the labor requirements and the organizational responses involved in building the Meddler platform mound complex.

Crawford, Gary (Toronto) and Catherine D'Andrea (Simon Fraser)

[4] ZOKU-JOMON (EPI-JOMON) SETTLEMENT PATTERNS INFERRED FROM ARCHAEOBOTANICAL STUDIES

The Zoku-Jomon of northeastern Japan is notable for its lack of material complexity. Settlements are small and houses are rarely found, food production is a minor or non-existent component of subsistence, and occupations appear to be short-lived. Two types of sites (a site with scatters of hearths and pits, and a cemetery associated with scatters of hearths and pits) are studied: K-135 and Mochiyazawa. Both have been extensively flotation sampled. The structure of each site and intra-site variations of plant remains are examined. Clear patterning of remains is evident, and reasons for the patterns are explored.

Creamer, Winifred (Northern Illinois)

[83] RECONSTRUCTING PROTOHISTORIC DEMOGRAPHY IN THE NORTHERN RIO GRANDE VALLEY

Ways to ascertain the magnitude of protohistoric (A.D. 1450-1680) population in the northern Rio Grande Valley of New Mexico are discussed. Data from recent surface collections and excavations at Pueblo Blanco and San Marcos Pueblo are used to identify what appear to be contrasting types of site use. There appears to have been contemporaneous construction of roomblocks at some sites and sequential construction at others, implying different length of occupation components, size of population, duration of overall site use, and size of population. Reconstruction of demography based on these data impacts generalizations based on room count and surface collection data.

Crock, John (Maine)

[79] SALADOID PERIOD LITHIC TECHNOLOGY AS SEEN FROM THE TRANTS SITE, MONTSERRAT, WEST INDIES

Until recently, lithic assemblages from Ceramic-Age Caribbean sites received little attention. Attribute analysis of samples from the Trants site on Montserrat address this deficit and enable comparison with the few other such studies conducted in the West Indies. The Trants lithic industries included expedient production of flakes, with apparently little investment in tools with fixed morphologies, and more complicated stone bead manufacture, both employing exotic raw materials. These industries are compared to other Ceramic period assemblages in the region as well as collections from earlier Archaic period sites.

Cross, John (Public Archaeology Lab)

[95] A LITHIC WORKSHOP AT KICHPANHA: PRODUCTION AND CONSUMPTION WITHIN A LATE PRECLASSIC MAYA COMMUNITY

Excavations at a Late Preclassic lithic workshop at the site of Kichpanha in northern Belize raise questions about the nature of production, exchange, and consumption in Maya society. The analysis of artifacts and column samples reveals that large chert land-clearing or woodworking tools were finished, fitted to handles, reshaped, and replaced at the workshop. The interaction between producers and consumers provides a context within which to examine the interplay of regional- and community-level political and economic processes, the nature of exchange and distribution of utilitarian items, and the role of craft specialists in the community.

Cross, P. (see Johannessen, S.) [42]

Crossen, K. (see Holmes, C.) [19]

Calbert, T. Patrick (Arizona) and Laura Levi (Arizona)

[5] TESTING FOR WETLAND AGRICULTURE: THE PROBLEM OF METHODS

As the debate about the extent and nature of wetland agriculture in the Maya lowlands has intensified in recent years, there has been a surprising dearth of field exploration for new areas of possible wetland cultivation. This paper maintains that without a significant investment in archaeological field research, there can be no resolution to the questions now being raised. New methods, however, will be necessary for adequate investigation of such areas as large interior bajos. Some of the methods tested by the authors at Rio Azul, Guatemala, are introduced as examples.

Cummings, Linda Scott (Paleoresearch Lab)

[8] CORN AGAIN TONIGHT? A NUTRITIONAL ANALYSIS OF AN ANASAZI DIET

Coprolites from a Pueblo III occupation of Hoy House and Lion House in Johnson Canyon, Colorado immediately to the south of Mesa Verde were examined for pollen, macrofloral, and faunal remains.

A descriptive report of the pollen contents of these coprolites has been published previously (Scott 1979). Stiger (1977) describes the macrofloral and faunal contents of these same coprolites, as well as the parasite record. Common and occasional elements of the diet are identified. Diets, as represented by these data bases, are examined for nutritional completeness. Probable nutritional deficiencies, deficiency-related diseases, and strengths of the diet are noted and discussed. It addresses the nutritional consequences of both a hypothetical varied diet, as well as one heavily reliant on agricultural produce, to the local population.

Cummings, Linda Scott (Paleoresearch Labs)

[61] PHYTOLITHS AS INDICATORS OF SUBSISTENCE: COPROLITES AND FEATURES

Phytoliths recovered from coprolites and features may be used to interpret subsistence activities. Coprolites from Peru, Nubia, and the American Southwest are compared and contrasted for phytolith evidence of diet. All three sets of coprolites have companion pollen evidence of food and leave different staples. The phytolith record is examined for its unique contribution to dietary reconstruction. In addition, phytolith records from features and groundstone are reviewed for their ability to contribute to a reconstruction of diet and subsistence.

Cunnar, Geoffrey (Andover Foundation for Archaeological Research)

[18] THE EXCAVATION, STRATIGRAPHY, AND CHRONOMETRICS OF PENDEJO CAVE, NEW MEXICO

Pendejo Cave, in south-central New Mexico, has yielded stratified deposits approaching 3 meters in depth with at least 25 different strata. Excavation of 2/3 of the cave utilized the La Perra technique and spanned three seasons, 1990-1992. A solid continuum of chronometric dates has been established which demonstrate the integrity of the deposits. Dates below zone C2A to O are pre-Clovis in age. Chronological evaluation of the discrete cave data are based on C-14, TL, and faunal association. The conduct of the excavations, the integrity of the stratigraphy, the chronometrics, coupled with other analyses has substantially enhanced the understanding of pre-Clovis habitat.

Cunningham, Jeremy (Calgary) Lynn Malinowski (Argonne National Labs) and Shawn Haley (Red Deer College)

[83] ALPINE ARCHAIC LITHIC ASSEMBLAGES FROM THE WASTACH MOUNTAINS OF CENTRAL UTAH

Preliminary analysis of artifact assemblages from three sites in the Manti-LaSal National Forest of central Utah has provided the first glimpse of Archaic hunter-gatherer lifeways in two alpine valleys (9,000–10,000 amsl). This analysis, including a microwear sample study, has yielded evidence of prehistoric subsistence activities during the early and middle Archaic Period. A summary of the analytic techniques and the evidence is presented. These results represent the first stage of a five year long archaeological project in the Manti-LaSal National Forest.

Curet, L. Antonio, Barbara Stark (Arizona) and Sergio Vasquez (Universidad Veracruzana)

[49] INTERPRETATIONS OF POSTCLASSIC PERIOD CHANGES IN SOUTH-CENTRAL VERACRUZ, MEXICO

Two Postclassic complexes have been distinguished using systematic surface data from the Mixtequila region. The earlier of the two is assigned to the Middle Postclassic and exhibits characteristics of the "Mixteca-Puebla horizon." The second complex dates to the Late Postclassic when the region was affected by the imperial expansion of the Aztec Triple Alliance. Changes in trade, population movement, or stylistic emulation alone do not account for the evidence. Political realignment, coupled with other factors, is proposed as a more promising interpretation.

Cushman, David (New Mexico Historic Preservation Division)

[23] WHEN WORLDS COLLIDE: THE IDENTIFICATION AND PRESERVATION OF TRADITIONAL CULTURAL PROPERTIES ON INDIAN AND NON-INDIAN LANDS

In 1990 the National Park Service issued Bulletin 38 defining Traditional Cultural Properties (TCPs) as resources that may be listed on the National Register of Historic Places. Since that time, state and federal agencies have begun to work with native American peoples, and other traditional societies, to incorporate these resources into the historic preservation review process for federal undertakings. This paper explores some of the social, legal, and political problems in identifying and preserving TCPs on Indian and non-Indian lands and presents recommendations for addressing these problems.

Czaplicki, Jon (Bureau of Reclamation)

[26] THE CENTRAL ARIZONA PROJECT: CONTRACT ARCHAEOLOGY AND RESEARCH IN CENTRAL ARIZONA

Completion of the Central Arizona Project (CAP) will mark the end of one of the largest cultural resource projects ever funded by the federal government. Done entirely by contract, CAP research

has made significant contributions to prehistoric and historic archaeology in Arizona and the greater Southwestern United States, the full impact of which will not be fully appreciated by archaeologists for years to come. How research was integrated into CAP cultural resource planning and significant contributions to archaeology that resulted from this research are the focus of this paper.

D'Altroy, T. (see Lorandi, A.) [73]

D'Altroy, Terence (Columbia)

[105] THE FORMATION OF INKA RULE IN NORTHWEST ARGENTINA

The formation of the southern Inka empire combined military conquest and diplomatic relations, resettlement, and focused exploitation of natural resources. The Proyecto Arqueológico Calchaquí is studying the consequent nature of state/provincial relations in the Calchaquí Valley. This paper discusses Inka strategies of occupation in NW Argentina, tying them into broader processes of imperial development, to provide the context for detailed study of settlement organization and political economy. Documentary and archaeological evidence implies two distinct phases and selective use of direct and indirect modes of governance during the century-plus that radiocarbon dating now assigns Inka dominion in Argentina.

D'Andrea, C. (see Crawford, G.) [4]

Dalan, Rinita (Minnesota)

[42] LANDSCAPE MODIFICATION AND THE EMERGENT MISSISSIPPIAN- MISSISSIPPIAN TRANSITION

Data on the timing, character, and extent of landscape modification, placed within the context of a model linking agriculture, settled communities, and monumental construction, aids in understanding the rise of the Cahokia site. This information derives from geophysical surveys and laboratory magnetic studies, coupled with the results of soil-chemical analyses and archaeological excavations. Restructuring of the landscape, manifest as a burst in large-scale earthmoving activities within the central portion of the site, occurred simultaneously and was intertwined with restructuring of the socio-political and agricultural systems documented for the Emergent Mississippian-Mississippian transition.

Dalan, Rinita (Minnesota)

[72] YOU CAN'T RESIST THEM: ELECTRICAL AND ELECTROMAGNETIC SURVEYS

Although the first geophysical applications in archaeology were electrical surveys, magnetic surveys quickly surpassed them in frequency of application. Competition with the rapid and successful magnetic method has driven many of the subsequent developments in both electrical and electromagnetic applications.

Viewed in conjunction with other scientific methods, the impact of geophysical methods in areas such as preservation and research design is clear. Yet, perhaps a more interesting topic to consider is how archaeological research agendas have influenced the use of these methods, and what promise these methods hold for future archaeological studies.

Dandridge, Debra (USDA Forest Service) and Claire Dean (North Dakota)

[2] ROCK ART CONSERVATION IN SOUTHEASTERN COLORADO

A prehistoric rockshelter, 50T249, in southeastern Colorado, was vandalized with spray paint by juveniles. While an investigation resulted in fines and restitution to the Forest Service, the restitution was inadequate to cover the cost of rehabilitation since the vandalism was in close proximity to prehistoric rock art requiring the services of a professional conservator. In order to defray rehabilitation costs, Passport in Time volunteers were enlisted. This paper will discuss the conservation efforts at 50T249, the difficulty of removing old, weathered graffiti, and additional research into the problems of removing aged vandalism.

Daneels, Annick (Belgian Archaeological Mission)

[49] SETTLEMENT PATTERN IN THE LOWER JAMAPA-COTAXTLA BASIN, CENTRAL VERACRUZ, MEXICO

A macroscale survey of 480 sq. km. on the coast, south of Veracruz, revealed 132 sites, dating from 1000 B.C. to A.D. 1500. A cultural climax seems to have been reached regionally during Early and Middle Classic, as indicated by population growth, occupation of previously uninhabited areas, and introduction of hydraulic control systems. Sites show a standard layout around a main plaza, often with a ball court. Comparisons with adjacent areas show a definite trend towards regionalization during the Classic period.

Daniels, R. (see Sandefur, E.) [105]

*Danien, Elin (Pennsylvania)***[63] FROM TLINGITS IN PLAINS CLOTHING TO SMOKE SCREENS ON TV: PUBLIC PROGRAMMING AT PENN'S UNIVERSITY MUSEUM**

Films, novels, and popular texts have created a broad potential audience for archaeology museums, even while some curators fight to keep "the philistines" from the door. This conflict is examined through the experience of Penn's University Museum, which has had a commitment to public programming from the days of its first director at the beginning of this century. Some of the programming experiments, including wild failures and surprising successes, are discussed.

Dann, M. (see Karalias, N.) [64]

Davidson, Iain (New England)

[25] POWER OF PLEISTOCENE PICTURES

The paper starts from an argument previously developed that there is evidence from the Upper Paleolithic of western Europe for the early appearance of restriction of access to information conveyed through paintings and engravings. This may be the earliest evidence for the differential use of power in prehistory.

The paper then considers the archaeological record for changing roles of the phenomena sometimes lumped together as "prehistoric art" from the perspective of a late emergence of language. Examples are taken from western Europe and Australia.

Davis, C. (see Osborn, J.) [2]

Davis, Christine (Christine Davis Consultants)

[52] A UNIQUE 17TH CENTURY SETTLEMENT PATTERN AND EXCHANGE NETWORK IN WESTERN PENNSYLVANIA: THE SONY SITE

One of the largest and most complex Late Prehistoric villages in the Northeast was excavated by a multidisciplinary team during the 1992 field season. A charnel house with 24 adult burials was found on a mineral spring within the stockaded village. Circular "petal" houses surrounded by 7 to 22 storage structures were encircled by precincts of houses in the 8.5 acre village. The Protohistoric village was superimposed over an earlier Middle Woodland habitation site and a small Drew Phase village. The excavation challenged all previous models and provides a foundation for future research in Late Prehistoric archaeology.

Davis, Hester (Arkansas Archaeological Survey) [Discussant 109]

DeBlois, Evan (USDA Forest Service) [Discussant 2]

DeBoer, Warren (Queens) Leon Doyon (Yale) and Arthur Rostoker (CUNY Graduate Center)

[60] PROBLEMS AND PROSPECTS IN ECUADORIAN PREHISTORY

Although small in size, Ecuador has played a major part in continuing debates concerning the role of the humid tropics on the wider stage of New World culture history. In a review of the last quarter century of archaeological study, we argue that grand diffusionary schemes, over-arching constructs such as Tropical Forest Culture, and a periodization based on "evolutionary" stages rather than on correlations of sound local chronologies have all impeded genuine understanding. Once freed from these conceptual bedevils, Ecuador offers an excellent opportunity for dissolving false boundaries that misrepresent the linked histories of highland and lowland South America.

deFrance, Susan (Florida)

[12] SPANISH COLONIAL ADAPTATION TO SOUTHERN PERU: FAUNAL DATA FROM THE MOQUEGUA REGION

Spanish settlement of the southern Peruvian coastal river valleys and the introduction of new agricultural and industrial enterprises such as wineries and livestock haciendas altered indigenous systems of production and subsistence. A unique pattern of Spanish colonial animal use emerged as a result of introductions of Old World domesticates in combination with the faunal resources of the Central Andes. Zooarchaeological data from four Spanish colonial wineries located in the Moquegua valley and the late prehistoric/colonial site of Torata Alta provide insights into Spanish adaptation to the south Central Andes.

DeRoche, Carole (Cambridge)

[28] TEXTILE ECOLOGY: THE PRODUCTION PROCESS IN ITS ENVIRONMENT

Material culture is our chief source of information about the behavior of prehistoric peoples. Thus artifact analyses require careful planning and execution. The ecological approach, employed effectively in the ceramics field by Matson, Arnold, and Kolb, is now applied to archaeological textiles from later prehistoric Europe. Through a consideration of the physical, biological, and cultural

environments of this textile production, the mechanisms acting to restrict or promote it are assessed. By putting the textiles into their behavioral contexts, it becomes possible to make inferences about the technological, economic, and social processes involved in fabric manufacture.

de Selveira, Maura Imazio, Anna Roosevelt (Illinois) and Rupert Housley

[104] EIGHTH MILLENIUM POTTERY (UNCALIBRATED) IN THE AMAZON: EVOLUTIONARY IMPLICATIONS

Early models of the origins of pottery in the Americas assumed that the craft would arise with incipient agriculture in highland centers and spread to the tropical lowlands. In three decades, however, evidence has emerged that pottery in this hemisphere is earliest in tropical lowlands. First, estuarine sites in northern South America produced sixth millennium dates on charcoal and shell with pottery, and now Amazonian sites have produced eighth millennium dates (uncalibrated) on pottery from communities subsisting on fishing and shellfishing, not on agriculture. This presentation will illustrate Amazon sites and discuss evolutionary issues raised by the new finds.

Dean, C. (see Dandridge, D.) [2]

Dean, Jeffrey (Arizona)

[41] PALEOENVIRONMENT VARIABILITY IN THE AMERICAN SOUTHWEST DURING THE LAST 2,000 YEARS

Recent paleoenvironmental reconstructions based on geology, palynology, packrat midden analysis, and dendrochronology specify Southwestern environmental fluctuations at several different wavelengths during the last two millennia. Interactions between low and high frequency environmental variables identify periods when conditions favored or inhibited various subsistence strategies ranging from hunting and gathering to intensive agriculture. This knowledge allows the derivation of hypotheses relating to the probable success or failure of different adaptive responses. Archaeological tests of these propositions illuminate various aspects of sociocultural stability, variation, and change in the many different habitats of the Southwest.

Dean, Jeffrey (Arizona)

[72] RECENT ADVANCES IN ARCHAEOLOGICAL DENDROCHRONOLOGY

During the last 25 years archaeological dendrochronology has progressed on many fronts. Concern with the evaluation of tree-ring dates has furthered the development of archaeological dating theory. Methodological advancements include the refinement of statistical crossdating techniques, densitometric dating, and multivariate techniques for reconstructing paleoenvironmental variability. Growing interest in archaeological chronology and climate variability has stimulated the application of tree-ring dating throughout the world. This expansion has produced multimillennial ring chronologies from North America, Europe, Australia, and Asia that serve as standards for dating archaeological samples, as proxy climate records, and as references for the calibrating other chronometric systems.

Dean, Jeffrey (Arizona) [Discussant 103]

Deaver, Sherri (Ethnoscience) [Discussant 3]

Demarrais, Elizabeth (UCLA)

[105] REGIONAL SETTLEMENT ORGANIZATION IN THE CALCHAQUI VALLEY UNDER INKA RULE

This paper presents an analysis of the regional organization of Inka-period settlements in the Calchaqui Valley. The state infrastructure provided a network of facilities for activities related to Inka rule. These included fortresses, administrative settlements, residential sectors, storage facilities, and agricultural facilities, all joined by a road system. Analysis of their spatial distribution and the use of the space within them provides a means of assessing the strategies by which the Inkas secured the region, mobilized labor and resources, and integrated local populations through public ceremony and feasting.

Demel, Scott (Illinois) and Robert Hall (Illinois)

[33] BORROW PITS AND PONDS WITHIN MISSISSIPPIAN SITE PLANS

Mississippian borrow pits were used for sources of mound fill, pottery clay and daub and as ponds utilized as aquatic medicinal gardens and have been found as the terminus of "avenues or highways" leading from "pyramidal hills/artificial mounds." Those like that beneath Mound 51 at Cahokia are located above flood level and were refilled purposefully and quickly with refuse. By contrast, pit 5-IA at Cahokia originated in part in a lowland area and was refilled naturally. The location and reuse of these borrow pits and ponds within what was then "prime real estate" and within a "ritual precinct" sometimes involved "prehistoric urban renewal."

Derevyaniko, A. (see Nash, D.) [111]

*Diaz-Granados, Carol (Washington)***[10] A STYLISTIC, CONTEXTUAL, AND FUNCTIONAL ANALYSIS OF MISSOURI'S PETROGLYPHS AND PICTOGRAPHS**

The first statewide rock graphic survey was recently completed and produced a total of over one hundred sites. Analyses of the contents and contexts of these sites has allowed the identification of nine major styles. Iconography of the primary style grouping strongly correlates with the mythology of cultures linguistically connected to Missouri's historic Native American groups and offers new information on the possible function these sites may have served. Both newly discovered and previously reported rock graphics were scientifically recorded to produce a data bank of slides photograph, acetate tracings, and drawings to be used for this and subsequent studies.

*Dickson, D. Bruce (Texas A&M)***[51] AN ETHNOARCHAEOLOGICAL SITE SURVEY OF DRY ROCKSHELTERS FORMERLY OCCUPIED BY MUKOGODO MAASAI HUNTER-GATHERERS OF LAIKIPIA DISTRICT, KENYA, EAST AFRICA**

An archaeological site survey undertaken in the Mukogodo Forest in the eastern Laikipia District of Kenya during the summer of 1992 resulted in the location and mapping of 23 dry rockshelter sites. These shelters were occupied until the 1930s by Mukogodo Maasai hunter-gatherers. The rockshelters are located in a nonmarginal environment and some of their former residents are still alive and capable of shedding light on how they were used. The sites therefore represent a unique opportunity for ethnoarchaeological research. Future excavation of these sites will allow a comparison of archaeological evidence with informants' testimony.

*Dillehay, Tom (Kentucky) [Discussant 62]**Dillehay, Tom (Kentucky) and José Berenguer***[73] ZONAL COMPLEMENTARITY AND OTHER SOCIO-ECONOMIC STRATEGIES IN THE SOUTHERN ANDES: A CRITICAL REVIEW**

The modern history of Andean ethnographical and archaeological investigations is a succession of different interpretative models of socio-economic strategies (e.g., transhumance, verticality, zonal complementarity). These perennial models affect the conduct of archaeological inquiry, yet archaeologists reluctantly assess them critically. The use and implication of these models are explored and illustrated with examples drawn from several areas of the Andes. The strength of these models lies in their potential ability to explain the distribution of non-local resources and cultural traits. Their weakness lies in their neglect of local development and in their repetitive dependence on interpretative convention. To make more effective use of these (and other, as yet, formulated) models and to reduce their debilitating effects on the interpretation of archaeological variability, we encourage more critical self-reflection and more attention paid to the application of archaeological knowledge.

*Dirkmaat, D. (see Adovasio, J.) [64]**Dirkmaat, Dennis, James Adovasio and David Pedler (Mercyhurst)***[80] HUMAN REMAINS FROM ORTON QUARRY SITE, ERIE COUNTY, PENNSYLVANIA**

The large human skeletal assemblage from an ossuary at the Orton Quarry site (36ER243), a Proto-Erie Indian village radiocarbon-dated to A.D. 1215 ± 40 (Pitt-1130), offers a unique perspective on this little-known prehistoric group. Contextual and bioanthropological data from the site are compared to ethnographic accounts of contemporaneous regional burial practices, particularly the prehistoric Huron "Feast of the Dead." The mapping system employed during excavation—which involved in-situ documentation via pieceplotting and large-format photography, rapid extraction, and computer-assisted manipulation and storage of photographic data—is described and illustrated.

*Dobbs, Clark (Institute for Minnesota Archaeology)***[67] A PILOT STUDY OF HIGH PRECISION RADIOCARBON DATING AT THE RED WING LOCALITY**

Between A.D. 1000 and 1300, the Red Wing Locality emerged as a northern center of Mississippian influence and interaction. Poor chronological control has hindered understanding the interaction between Red Wing and southern Mississippian groups, as well as the emergence of Oneota culture in the region. New advances in radiocarbon dating allow more precise age determinations. Twelve high-precision radiocarbon dates have been obtained from the Bryan site. These calibrated dates suggest a maximum occupation period of A.D. 1150 to 1250, indicating that the site was occupied for only one or two generations and was contemporary with the Stirling Phase at Cahokia.

*Dobres, Marcia-Anne (California-Berkeley)***[65] SOCIAL AGENCY AND THE DYNAMICS OF MAGDALENIAN BONE AND ANTLER TECHNOLOGY**

Technology bears directly on issues of social organization, just as social organization bears on the facilitation and organization of technological activities. The processes by which techniques are

employed to modify natural resources into cultural objects are decidedly social and permit sustained inquiry into prehistoric social agency. The methodology and social theory required to achieve the goal of proposing testable models for the social organization of such activities are outlined, and preliminary findings for research investigating the complexity and intensity of concomitant osseous technological activities practiced during the late Magdalenian in the eastern French Pyrenees are presented.

*Dockall, H. (see Powell, L.) [28]**Dockall, John (Texas A&M)***[14] FUNCTIONAL VARIABILITY OF POINTED TOOLS FROM THE MIDDLE PALEOLITHIC AT SHANIDAR CAVE, IRAQ**

Use-wear analysis of a sample of pointed tools from Shanidar Cave indicates a similar pattern of tool usage that has been described for the Levantine Mousterian. This suggests basically similar patterns of behavior associated with tool use in the Zagros and the Levant. Tool usage included such inferred functions as cutting, scraping, awl/drill, engrave, wedge, and projectile impact. Hafting wear is also associated with implements with cutting wear and projectile impact. Correspondence between tool type and function is suggested for highly retouched tools.

*Dodge, G. (see Howe, K.) [66]**Doelle, W. (see Wallace, H.) [83]**Doelle, William [Discussant 107]**Doershuk, J. (see Bergman, C.) [40]**Dohm, Karen (Smithsonian Institution) and Daniel Rogers***[82] CERAMICS AND DOMESTIC ORGANIZATION: POST CONTACT COALESCENT ARIKARA**

The vessel size component of pottery assemblages from historic Arikara lodges may be regular. Pots of specific sizes may have a regular frequency relative to each other in Post Contact Coalescent lodges that cross-cuts historic period divisions and lodge sizes. Analysis uses River Basin Surveys collections from burned lodges. Preliminary findings offer some further understanding of social organization of Arikara within lodges in that the ceramic assemblage suggests that lodges either functioned as corporate units or that individual households contributed pots to lodge assemblages in a formal ratio.

*Dongoske, K. (see Ferguson, T.) [23]**Doolittle, W. (see Neely, J.) [100]**Doonan, William (Tulane) and John Hoopes (Kansas)***[93] OYSTERS, COCKLES, CLAMS & SNAILS: CHANGING PATTERNS OF PREHISTORIC SHELLFISH EXPLOITATION IN SOUTHERN COSTA RICA**

Excavations of coastal shell middens in Golfito, Costa Rica have provided a wealth of information on prehistoric strategies for the exploitation of rainforest and estuarine resources during the Aguas Buenas (AD 20.0-600) and Chiriquí (AD 700-1500) periods. Among the patterns noted were shifts in shellfish species that suggest anthropogenic alteration of estuarine habitats through increased sedimentation rates due to shifting agriculture. It is argued that even small-scale preindustrial societies can permanently degrade sensitive coastal ecosystems.

*Dore, Christopher (New Mexico), Michael Smyth and Lora Anderson (Cincinnati)***[37] MAYA COMMUNITY PATTERNS VIA "LA RUTA PUUC": THE 1992 SAYIL PROJECT**

The 1990 and 1992 Sayil Archaeological Project (Phase III) set out to intensively sample the surface of a large Terminal Classic center within the Puuc hills region of Northern Yucatan. The recently completed fieldwork stage of this site-scale investigation collected surface data to reconstruct past activities, relate them spatially to architectural remains, and reveal patterns of community organization. This paper reports preliminary results of the 1992 field season, discusses large site-scale methods, and proposes broader implications for identifying and understanding those major cultural components that formed Prehispanic Maya urban places.

*Downer, A. (see Benally, L.) [86]**Downer, Alan (Navajo Nation Historic Preservation Dept.)***[109] WORKING THE HILL: NAVAJO NATION EXPERIENCE LOBBYING CONGRESS AND FEDERAL AGENCIES FOR CULTURAL RESOURCE PRESERVATION**

Since its establishment in 1986, the Navajo Nation Historic Preservation Department has actively lobbied Congress supporting both substantive cultural resources protection legislation and funding

for cultural resources activities. The successes and failures experienced by the Navajo Nation are due to the nature of the lobbying effort, the "Capitol Hill" perspective on cultural resources issues, and the fact that the lobbying was being done by a tribal government. The Navajo Nation's experience in these activities provide insight into the lobbying process as a whole.

Downum, Chris (Northern Arizona)

[63] MUSEUMS AND THE INFLUENCE OF NATIVE AMERICANS ON SOUTHWESTERN ARCHAEOLOGY

Native Americans have shaped Southwestern archaeology in important but often unrecognized ways. Historically, many of the contributions of Native Americans have come in the context of museum-based anthropological and archaeological investigations. This paper identifies the various stages of Museum-Native American interactions in the U.S. Southwest, and considers the impacts of recent federal legislation and intervention on these relationships.

Doyel, David (San Juan County Museum)

[100] THE GATLIN SITE, GILA BEND, ARIZONA: SITE STRUCTURE AND ORGANIZATION

Gatlin Site National Landmark is a large Hohokam village located near the Phoenix Basin in southwestern Arizona that contained numerous mounds, plazas, ball courts, and an extensive irrigation system dating between A.D. 900 and 1200. Field and archival research suggests that the Gatlin site exhibits a structure similar to other Hohokam villages, and that the site played an important role in inter-regional exchange systems connecting the Phoenix Basin with the marine resources located in the Sea of Cortez.

Doyon, L. (see DeBoer, W.) [60]

Drass, Richard (Oklahoma)

[90] PLANT USE AND CHANGES IN SUBSISTENCE DURING THE PROTOHISTORIC PERIOD ON THE SOUTHERN PLAINS

Macrobotanical remains from three protohistoric sites in the mixed grass prairie of western Oklahoma are compared with plants from earlier Plains Village sites. The evidence supports some changes in subsistence and settlement practices, but it appears that horticulture remained an important activity. Comparisons of plant remains from a fortified camp, a small village, and a large camp indicate differences in the abundance of corn at the fortified site. The small quantity of corn at this fortified camp supports evidence that this may have been a seasonal bison processing site.

Drennan, Robert [Discussant 49]

Drennan, Robert and Dale Quatrin (Pittsburgh)

[21] SOCIAL INEQUALITY AND AGRICULTURAL RESOURCES IN THE VALLE DE LA PLATA, COLUMBIA

Several mechanisms involving the nature, distribution, and control of basic agricultural resources may drive or at least permit the development of social inequality. A GIS analysis of prehispanic settlement data, supplemented by information from recent excavations, identifies ways in which such mechanisms might have operated in the Valle de la Plata during the periods when chiefdoms developed, and evaluates the extent to which settlement distributions fit what might be expected if such mechanisms were an important part of the social dynamic of these early chiefdoms. Results are compared briefly to other New World chiefdoms.

Driver, D. (see Garber, J.) [75]

Drooker, Penelope (New York-Albany)

[19] EXTERNAL RELATIONS: EXOTIC MATERIALS AND ARTIFACTS AT MADISONVILLE

The Madisonville site has yielded over 350 brass, copper, and iron items and a small handful of glass beads, plus non-local pipes, shell ornaments, and other exotic items. Their likely sources range from Spanish incursions in the south to Basque fishing expeditions in the lower St. Lawrence, and from peoples of the western and eastern Great Lakes to peoples of the southeastern interior chiefdoms. Key artifact types, their quality and quantity, reworking/use wear patterns, and provenience (burial/non-burial) will be discussed, with implications for site occupation dates, social organization, and exchange relationships.

Duff, A. (see Kintigh, K.) [35]

Duff, Andrew (Arizona State) and James Burton

[83] INSIGHTS INTO POST-CHACOAN SOCIAL ORGANIZATION UTILIZING WEAK ACID-EXTRACTION ICP ANALYSIS OF CERAMICS

Weak acid-extraction ICP compositional analysis of utilitarian and decorated ceramics is used to examine the scope of post-Chacoan community (A.D. 1175-1275) in east-central Arizona. After briefly

outlining the procedure, we develop a theoretical basis for the study of intra-regional exchange. Exchange among settlements demonstrates that post-Chacoan organization incorporated an area larger than is traditionally defined by aggregated communities. We argue that it is misleading to view aggregated settlements in isolation, suggesting that dispersed roomblocks, often 5 kilometers distant, need to be incorporated into models of aggregated community behavior.

Dunavan, Sandra (Michigan)

[91] MADISONVILLE PALEOETHNOBOTANY: CHANGES IN LATE PREHISTORIC CROPS AND THE USE OF NATIVE PLANTS

Since the recovery of four or five bushels of burnt corn from a pit feature in 1879, it has been known that maize was important in the diet of the Madisonville inhabitants. The analysis of flotation samples from the excavations over a century after this find adds unforeseen insights to our understanding of the prehistoric use of plants in the middle Ohio valley, however. Crops, both native and introduced, and the collection and management of many other important plants are examined from the late 13th century and mid 17th century components at Madisonville.

Dunham, Gary (Virginia)

[36] SOLIDARITY THROUGH DEATH? THE ARCHAEOLOGY OF COLLECTIVE BURIAL RITUALS

Despite the increased emphasis placed upon mortuary analysis over the past twenty years, relatively little theoretical attention has been given to the phenomenon of collective burial ritual. This paper reviews current interpretation of such mortuary rituals and evaluates their analytical potential for contributing to explanations of long-term cultural stability and change. Archaeologists usually assign an integrative social function to collective burials, assuming that the ritual manipulation and disposal of multiple dead creates an egalitarian solidarity for both the dead and living. Drawing upon recent, post-structuralist theories of ritual, I argue that this line of interpretation circumscribes the analytical capability of the rituals, because it presumes incorrectly that they work primarily to overcome social differences rather than to maintain or produce them. Recasting collective burial rituals as arenas of social contradiction and potential transformation helps to account for the simultaneous emergence of two different forms of these rituals in Virginia during the late prehistoric period (ca. 900-1600 A.D.)—ossuaries along the coastal plain and community burial mounds in the interior.

Dunnell, Robert (Washington) [Discussant 47]

Dunnell, Robert (Washington)

[22] LANGDON, A FORTIFIED MISSISSIPPIAN SETTLEMENT ON THE MALDEN PLAIN

The form of Mississippian settlement is highly variable in the central Mississippi valley and particularly so on the Malden Plain as Teltser has recently shown. Although not as large as the monstrous Rich Woods site, the rectangular, elevated "St. Francis-type" settlements are among the most spectacular. The Langdon site is one such walled and ditched location with at least five pyramidal mounds. Surface investigations over the past ten years now allow a sketch of the structure of this kind of community to be drawn.

Dunning, N. (see Logan, D.) [97]

Dunning, Nicholas (Cincinnati)

[5] THE PREVALENCE AND VARIETY OF AGRICULTURAL TERRACING IN THE MAYA LOWLANDS

Ancient agricultural terracing in the Maya Lowlands was the product of demand forces conditioned by environmental factors. While the prevalence of terracing is clearly associated with Late Classic population growth, it was strongly conditioned by environmental variability. Variation in the form of terracing employed at a given location was the result of environmental adaptation and incremental evolution. Data from the Petexbatún, Vaca Plateau, Rio Bravo, Rio Bec, and Puuc Hills regions are presented. The role of terracing or lack of terracing in slope management and its relationship with recorded variation in ancient soil erosion and sedimentation are also considered.

Durand, Stephen (Eastern New Mexico) Martin Rose (Desert Research Institute) and Phillip Shelle (Eastern New Mexico)

[35] TECHNIQUES FOR IDENTIFYING TREE SOURCE AREAS, PART 2

At least 200,000 trees were used in the construction of the buildings in Chaco Canyon, AD 900-1200. Tree species used in construction are not present in the canyon today and may not have been present during the AD 900-1200 period. It has established that modern tree stands vary geochemically. This paper presents the result of geochemical analyses of prehistoric wood samples from Chaco Canyon. These results are compared with the chemical signatures from previously analyzed modern

trees and suggest that with larger samples of both modern and prehistoric wood, the source area(s) for construction timbers used in Chaco Canyon can be identified.

Dye, David (Memphis)

[22] WALLS ENGRAVED: AN ELITE WARE IN THE CENTRAL MISSISSIPPI VALLEY

Engraved ceramic wares from the Central Mississippi Valley are examined in terms of their spatial and temporal distribution at the Chucalissa site. The occurrence within specific contexts suggests that this ware served a variety of purposes within the social context of sixteenth century Mississippian chiefdoms. The distribution of Walls Engraved ceramics within the Central Mississippi Valley underscores the crucial role it played as a communicative device among chiefly polities.

Dyson, Stephen (SUNY-Buffalo)

[77] POTTERY AND PROGRESS: THE ROMAN CERAMIC INDUSTRY AND SETTLEMENT GROWTH

Roman ceramic production represented one of the most complicated proto-industrial systems that ever existed. Production was in the millions and the distribution networks extended over hundreds of miles. It operated on several quality levels. The sale of these ceramic products to all groups in Roman provincial society was a major stimulus to the development of a market economy. Much of this activity was centered in Western Europe during the first-third centuries A.D. This paper will look at the ceramic production and distribution in relation to the growth of settlements in Roman Gaul, Germany, and Britain. In conclusion, some comparisons will be made with the emergence of industrial ceramic production in eighteenth century England.

Earle, Timothy (UCLA)

[105] WEALTH FINANCE AND ATTACHED SPECIALIZATION IN THE INKA IMPERIAL EXPANSION INTO THE CALCHAQUI VALLEY

A central reason for the Inka expansion into the Calchaqui Valley was to procure wealth objects for state finance. Evidence from the Inka site Potro de Payogasta shows development of attached specialization. Manufacturing of gold and copper items, beads of marine shell, malachite, and human teeth, and mica disks, occurred throughout residential areas, but was concentrated in elite-associated households. Craftwork at the local settlement Valdez was apparently limited, except for preliminary processing of copper into ingots. The state therefore apparently monopolized key steps in wealth production. Some wealth was locally distributed, but metal goods were apparently moved long distances for state distribution.

Early, Ann (Arkansas Archaeological Survey)

[109] SINKING OR SWIMMING IN THE 90'S: MAKING COPA WORK

Archeology in the 90s will be carried out in a political context, whether it is conducted from a Museum basement, a college classroom, or an agency office. For the profession and its practitioners to navigate in this public domain, information on legislative, economic, and social trends is as important as scholarly advances. Providing timely news to SAA members and encouraging their engagement in the political process without contributing to the information glut we all face is the challenge to making COPA an effective instrument of the SAA.

Earnest, H. (see Fowler, W.) [13]

Eddy, Frank (Colorado) and Dale Lightfoot

[35] AIR PHOTOGRAPHIC INTERPRETATIONS FOR THE CHIMNEY ROCK ARCHAEOLOGICAL AREA, COLORADO

Aerial photography was performed as a series of six black-and-white panchromatic stereo-pairs flown at a scale of 1:6675. Coverage represents 33.8 per cent of the entire Chimney Rock Archaeological Area, a scientific and scenic set-aside made by the San Juan National Forest as a means of preserving Anasazi archaeology of the 10th through 12th centuries. A map of prehistoric features was prepared which was ground checked for accuracy. An efficiency index of 65 per cent was achieved by comparison with ground survey. Transect analysis revealed a bimodal distribution of house types which were explained by four hypothesis.

Edens, Christopher (Harvard)

[110] MOUNTAINS AND LOWLANDS?: THE KURA-ARAXES EXPANSION AND ARCHAEOLOGICAL INTERPRETATION

The Kura-Araxes culture complex of Transcaucasia achieved a wide distribution during its history (mid 4th to late 3rd millennium BC), appearing in E Anatolia, NW Iran and Syro-Palestine. The KA expansion seemingly occurred immediately after the Late Uruk horizon, and may have been a response to the collapsing Late Uruk (world) system. After examining the definitional and chronological

problems of the KA, this paper explores the issues raised by the KA expansion: diffusion, migration, trade, and world systems as alternative frameworks.

Eldridge, Stuart (Northfield-Mt Hermon)

[29] LATE ARCHAIC COASTAL HUNTER-GATHERER ADAPTATION IN CENTRAL MAINE: A PERSPECTIVE FROM THE STANLEY SITE, MONHEGAN ISLAND, MAINE

The Stanley Site on Monhegan Island, Maine, 12 miles off the coast of central Maine, is entrenched in the literature as a Late Archaic swordfish hunting station and is an integral part of hypotheses regarding coastal adaptations of the period. The site, however, has not been excavated professionally until recently. Current investigations at the Stanley Site have produced swordfish remains and diagnostic artifacts of the Late Archaic. Regardless, the traditionally convenient inclusion of this site in a large scale, regional settlement and subsistence strategy must be critically examined within the framework of coastal hunter-gatherer adaptation models and theory.

Elkin, Dolores (CONICET-Instituto Nacional de Antropología)

[36] VOLUME DENSITY OF SOUTH AMERICAN CAMELIDS SKELETAL PARTS

The volume density of a bone, defined as its mineral content per volume unit, is known as an important variable related to the differential destruction of skeletons. I present the results of volume density measurements for guanaco, llama and vicuna skeletal parts. The mineral content values were obtained with a densitometer, and the volumes were measured by water displacement. The volume density values are compared with previous ones based on volume estimations using calipers, revealing significant differences. Finally, I present a taphonomic model that predicts the differential destruction of bones for the taxa involved here and for some other artiodactyls.

Ellis, Christopher (Western Ontario) and Jonathan Lothrop (Berger Assoc.)

[34] TECHNOLOGICAL CHANGE DURING THE PALEOINDIAN AND ARCHAIC PERIODS IN EASTERN NORTH AMERICA

This paper focuses on potential explanations for technological change during the Paleoindian and Archaic periods in Eastern North America. Evidence for changes in lithic technology that took place during this time span are reviewed. Models that attempt to explain these changes are then summarized and evaluated in light of the present data.

Ellison, Joanna (Bermuda Biological Station for Research)

[70] STRATIGRAPHIC AND POLLEN RECORDS OF FOREST CLEARANCE AND SOIL EROSION BY EARLY SETTLERS OF MANGAIA, COOK ISLANDS

Stratigraphy of taro swamps situated against the inner makatea rim of Mangaia show that prior to human arrival five lakes existed where there are now clay swamps. Pollen analysis results of two cores show some forest clearance beginning 2600 years BP, associated with burning as shown by charcoal concentrations. Widespread clearance occurred by 1650 years BP, resulting in massive soil erosion from the inner volcanic cone and infilling of the lakes with clay. The volcanic cone became vegetated by Dicranopteris, a fern which colonizes disturbed land. A further stage in island disturbance occurred at about 610 years BP.

Ellwood, Brooks (Texas-Arlington), Karl Petruso and Frank Harrold (Texas—Arlington)

[14] MAGNETIC AND ELECTRICAL STUDIES IN KONISPOL CAVE, A NEOLITHIC SITE IN SOUTHWESTERN MOST ALBANIA

Electrical resistivity, magnetic susceptibility and remanent magnetic studies have been performed in Konispol Cave located in southwesternmost Albania. Electrical resistivity was used to estimate areas where optimum cultural returns could be expected from excavation at the site. Magnetic susceptibility on two colors of pot sherds from the Neolithic through Bronze age was used to determine if the clay source was the same for both types of sherd. And the paleomagnetism of oriented samples from Early through Late Neolithic sediments in the cave, in conjunction with radiocarbon dates, provides preliminary archeomagnetic curves from the area.

Emerson, Thomas (Illinois Historic Preservation Agency)

[42] CAHOKIAN POLITICAL HEGEMONY: REFLECTIONS FROM THE COUNTRYSIDE

Recent models of the rise and fall of central Cahokian political hegemony by Milner (1990), Emerson (1991), and Pauketat (1991) reveal a commonality of patterning encapsulated in an abrupt political consolidation ca. A.D. 1000, a brief span of glory, and over a century of disintegration. Analyses seeking parallel paramount center—rural settlement relationships have yielded contrasting models, one stressing strong hierarchical control from the center (Emerson 1980), the other (Mehrer 1988) equal “independence”. This paper re-examines and quantifies the evidence from rural settlements with regard to mortuary programs, specialized ceramics, exotic minerals and artifacts, and site structure and

organization to argue that the countryside was tightly organized and controlled by the centralized elite at Cahokia.

Endicott, Julie (California-Berkeley)

[70] HOUSEHOLDS IN POLYNESIAN PREHISTORY: SOCIAL DIMENSIONS OF ENVIRONMENTAL CHANGE

Archaeological research in Polynesia has demonstrated the impact that humans have had on the island environments they inhabited, and the reciprocal effects that changing local environments had on island cultures. The impact of changing environments on social organization, however, requires further investigation in the remains of prehistoric households and communities. Recent research on Mangaia Island has focussed on the human-environmental interrelations of a society in which warfare was endemic and leadership positions were both ascribed (hereditary) and achieved. This paper examines the relationships between society and environment on Mangaia, and compares this case with other Polynesian societies.

Enloe, James (Iowa)

[7] DID PALEOLITHIC HUNTERS AT VERBERIE SHARE THEIR PREY? CLUES FROM SITE STRUCTURE AND ETHNOARCHAEOLOGY

Food sharing has been suggested to be a universal attribute of past and present huntergatherers, with major implications for the course of human cultural and biological evolution. It has been demonstrated at the Paleolithic residential campsite of Pincevent. Ethnoarchaeological models of economic anatomy and site structure have been used to interpret the late Magdalenian site of Verberie as a hunting camp. Spatial study of the distribution of refitted reindeer carcasses is employed to evaluate patterns of food sharing in relation to the identification of the site's functional role and for the interpretation of subsistence organization in the Magdalenian.

Ensor, Blaine (Geo-Marine)

[113] THE CLOVIS ASSEMBLAGE FROM THE BELLE MINA PALEO-INDIAN LOCALITY, MIDDLE TENNESSEE RIVER VALLEY, LIMESTONE COUNTY, ALABAMA

A virtual single component Clovis habitation site (ILi92) has been located approximately 5 km north of the Quad site in northern Alabama. This site is unique in its lack of mixing with later cultural materials. Analysis results demonstrate reliance upon a single chert type, the exclusive use of blade cores and bifacial blade-flake cores in the production of blanks and a restricted range of tool forms. A variety of domestic tasks were carried out including tool manufacture and maintenance as well as food preparation and consumption indicating that a seasonal base camp was present.

Erickson, Clark (Pennsylvania)

[20] PREHISPANIC INTERACTIONS BETWEEN THE LLANOS DE MOJOS AND THE ALTIPLANO OF BOLIVIA

Both the Altiplano in the central Andean highlands of Peru and Bolivia and the Llanos de Mojos in the eastern tropical lowlands of Bolivia have been recognized as important regions of prehispanic cultural development. Despite the paucity of actual archaeological data, various scholars have speculated on the nature of the relationships between these two important areas. The general consensus is a model of asymmetrical relations with the highlands dominating the lowlands. This paper critically evaluates the available data on the nature interaction and the various perspectives regarding the prehispanic relationships between these archaeologically significant regions.

Erlandson, Jon

[58] 11,000 YEARS OF HUMAN ADAPTATIONS TO THE CALIFORNIA COAST

Archaeological data suggest that the California coast has been occupied since Clovis times, ca. 12,000 years (CYBP) ago, and include remains of marine-adapted peoples who occupied San Miguel Island as much as 11,000 years ago. In this paper, I summarized some of the broad cultural developments that appear to have taken place among California's coastal societies during the past 12,000 years. I focus on economic, technological, demographic, and social changes, and discuss reasons that such developments may have taken place.

Estabrook, R. (see White, N.) [98]

Estrada-Belli, F. (see McCormack, V.) [57]

Ezzo, Joseph (Statistical Research) and Harold Krueger (GeoChronology Lab)

[8] DIET, NUTRITION, AND FOOD CHOICE AT GRASSHOPPER PUEBLO, ARIZONA

Multi-element and stable carbon isotope ratio analyses of the adult burials from Grasshopper Pueblo, a 14th-century site in east-central Arizona, reveal a pattern of dietary change through time

indicating an increased reliance on cultigens and concomitant decrease in the consumption of meat and wild plant foods. An increase in dental caries in adults through time is evident, and the overall health and nutritional status of the subadults declines in the late period of occupation (A.D. 1325-1400). A combination of social, environmental, and climatic factors led to increased dietary stress through time, possibly affecting the protein, calcium, iron, and zinc status of the population. The health and nutritional status of adult women appear to have been inferior to males, who had greater access to meat and cultivated food.

Fawcett, William (Utah State)

[11] PAHRANAGAT PAIUTES: TYPICAL DESERT FORAGERS, OR MARGINALIZED FARMERS

While Paiute and other Numic-speakers of the Great Basin are often viewed as being simple hunter-gatherers of the desert, the Pahrangat Paiutes practiced irrigation-based horticulture as late as the mid-19th century, before they were displaced through Anglo settlement and activities. The processes contributing to their marginalization encouraged the Pahrangats to become mobile gatherers and occasional hunters. From this perspective much of what the Kalahari revisionists are saying about the San (whom they argue also lived more diverse lifeways before becoming the marginalized foragers of ethnographic fame) makes considerable sense.

Feathers, James (Maryland)

[47] VARIATION AND SELECTION IN FIRING TECHNOLOGY OF LATE WOODLAND POTTERY FROM SOUTHEAST MISSOURI

Wide variation in firing of prehistoric pottery from Southeast Missouri is documented using X-ray diffraction, scanning electron microscopy and Mossbauer spectroscopy. Variation in degree of firing and atmosphere of firing are explored in the context of technological change, specifically the change to shell temper during the Late Woodland.

Feder, Kenneth (Central Connecticut)

[88] FRAUDS, MYTHS, AND MYSTERIES: SCIENCE AND PSEUDOSCIENCE IN ARCHAEOLOGY

The past never ceases to fascinate, intrigue, and amaze people. Perhaps, ironically, it is this built-in appeal that makes so many susceptible to frauds, myths, and supposed mysteries concerning the human past. From the Cardiff Giant to Piltdown Man, from the Moundbuilder myth to the Lost Continent of Atlantis, from "Scientific" Creationism to Chariots of the Gods, and from psychic archaeology to New Age prehistory, many have pandered to public fascination with human antiquity through hoaxes and pseudoscience. But archaeologists can do better than weave a past from the whole cloth of fantasy and fiction. We can construct a veritable past from the fabric of science.

Fedick, Scott (California-Riverside)

[75] ANCIENT MAYA AGRICULTURAL TERRACING: PREDICTIVE MODELING AND INITIAL FIELD VERIFICATION

An understanding of the regional agricultural landscape of the Maya lowlands must begin with local scale studies of agricultural adaption. A computerized Geographic Information System was used to model the distribution of terracing within the study area of the Belize River Archaeological Settlement Survey. Variables used in the modeling process consist of soil type, geological parent material, and slope as classified through the application of a digital elevation model. The predictions were tested during the spring of 1992, and very satisfactory results were attained. The modeling process is discussed, and the results of the field investigation are placed within the context of local and regional agricultural practices and settlement patterns.

Fenner, Gloria (National Park Service) and Patricia O'Brien (Kansas)

[16] CAHOKIA'S BOUNDARIES AND HINTERLANDS

Cahokia's borders are delineated in east-central Missouri and southwestern Illinois using "birdman" and "sun-circle" petroglyph distributions. Its polity encompasses diverse environments with important raw resources including salt, hematite, and galena, and covers possibly 52,000 sq. km. The few petroglyphs outside these boundaries are interpreted as examples of "flying the flag" because they are generally associated with specific resources and nearby intrusive Middle Mississippian temple-mound towns. Interestingly, these communities are often separated from each other at about 100-km. intervals at key riverine junctures on the Mississippi and Illinois River drainages.

Ferguson, T. (see Anyon, R.) [86]

Ferguson, T. J. (Institute of the North American West), Kurt Dongske and Eric Polingyouma (Hopi Tribe)

[23] WORKING TOGETHER: THE ROLES OF ARCHAEOLOGY AND ETHNOHISTORY IN HOPI CULTURAL PRESERVATION

The Hopi Cultural Preservation Office uses information derived from archaeology, ethnohistory, and consultation with elders to identify traditional cultural properties, evaluate potential impacts to these resources, and recommend appropriate mitigation measures. The goals are protection of cultural properties and greater understanding of Hopi prehistory and history. Cultural values require maintaining the confidentiality of some information in order to preserve the integrity of the resources. Hopi participation in the Glen Canyon Environmental Studies and SRP's Fence Lake Mine Project provides two examples of how Hopi culture and scholarly research are balanced to provide information needed for cultural resources management.

Ferring, Reid (North Texas) and John Humphrey (Colorado School of Mines)

[43] PALEOENVIRONMENTAL RECONSTRUCTIONS USING STABLE ISOTOPE ANALYSIS OF LATE QUATERNARY CARBONATES

Analysis of carbon and oxygen isotopes on pedogenic, lacustrine and spring carbonates is an effective approach for paleoenvironmental analysis associated with geoarchaeological projects. Especially when coupled with detailed sedimentology and pedology in the field, isotopic data constitute proxy records of plant biomass [carbon isotopes]. Carbonates are often contained in sediments that lack other biotic data such as pollen; therefore isotopic analysis of carbonates may be applicable and comparable over large regions. However, isotopic analysis must be done as part of a rigorous research strategy that includes reconstruction of pedogenic and sedimentary histories, as well as analysis of associated organic components of the geologic record. These methods offer significant potential for intra- and inter-regional environmental reconstructions in the late Pleistocene and Holocene.

Fetterman, Jerry (Woods Canyon)

[103] EARLY NAVAJO OR OLD WOOD BY AZTEC?

Woods Canyon Archaeological Consultants has been involved with a mitigation project in NW New Mexico. The area of the project is the Dinéhah, ancestral home of the Navajo peoples during the late 1600's to early 1700's. Recent research suggests that the Navajo may have occupied the area as early as the 1400's. Ten sites of Navajo occupation were excavated on this project with over 50 C14 samples processed, yielding an uncorrected mean date of AD 1250 +70. Some indication is present for use of old wood by utilizing other dating methods, but the consistency of the early dates is suspicious.

Fields, R. (see Glowacki, D.) [91]

Fish, P. (see Fish, S.) [41]

Fish, Paul, Suzanne Fish and James Bayman (Arizona)

[107] PRODUCTION, CONSUMPTION, AND TRADE AT THE MARANA MOUND SITE

Hohokam sites with public architecture and centralized functions yield a disproportionate share of materials that circulate in networks of external exchange. The manner in which such materials are incorporated into economic activities among the various social units residing at centers is examined at a Classic Period mound site in the Tucson Basin. Distributional data are derived from surface collections and trash accumulations associated with a large sample of the compounds that house distinct residential groups. These generalized patterns for compounds are augmented by excavations of enclosed structures. Results shed light on intra-site aspects of consumption, production, and trade.

Fish, S. (see Fish, P.) [107]

Fish, Suzanne and Paul Fish (Arizona)

[41] THE NATURE OF HOHOKAM POLITIES

Current research throughout the Hohokam tradition and on its peripheries has provided a new basis for examining variability in multisite polities over time and space. After A.D. 1100, developments parallel broader Southwestern trends toward heightened aggregation in areas amenable to intensive subsistence production. Developmental sequences include demographic and geographic rearrangements over relatively brief intervals, suggesting that competition for regional population is a significant aspect of interaction among entities. These dynamics of growth and aggregation have implications for the organization and integration of Hohokam polities.

Fisher, John (Montana) and Jean Hudson (California-Los Angeles)

[77] COMPARISONS OF SITE STRUCTURE BETWEEN TWO TROPICAL FORAGER GROUPS

Archaeological studies have revealed considerable diversity in site structure between prehistoric hunter-gatherers, but the reasons for this diversity are poorly understood. Ethnoarchaeological comparisons between two present-day tropical forager groups, the Aka and Efe pygmies of Central Africa, reveal both similarities and differences in site structure, and provide an opportunity to search for underlying causes. Campsite attributes that are examined include the number and location of hearths, dwellings, and other material remains. Ecological and economic factors are fundamental to understanding differences and similarities, but social factors also play an important role.

Fisher, Lynn (Michigan)

[111] OVERWINTERING STRATEGIES AND RISK AMONG HUNTER-GATHERERS: CLUES FROM THE ETHNOGRAPHIC RECORD AND AN ARCHAEOLOGICAL CASE FROM THE EUROPEAN LATE GLACIAL

Foragers in northern latitudes must solve problems stemming from seasonal and annual variations in resource availability. This paper uses ethnographic data to examine patterning between the nature of overwintering strategies and the structure of environments. Length of occupation of winter camps, logistic mobility, and storage are considered; several environmental variables are defined. Results are used to construct expectations for change in settlement systems during the Late Glacial and early Postglacial in southern Germany. Archaeological expectations are evaluated on the basis of site location data from Magdalenian, Late Paleolithic, and Early Mesolithic contexts in the region. Implications of change in settlement systems for explaining changes in the organization of lithic technology are considered.

Fitzgerald, Carlos (Pittsburgh)

[93] COASTAL RESOURCE EXPLOITATION BY CENTRAL PANAMANIAN CHIEFDOMS

Based on faunal analyses of samples from El Cano, a Late Ceramic site representing a chiefdom type polity and Panama Viejo, an Early Colonial urban site, this paper will present evidence for the continuity of patterns of consumption of marine resources in Central Panama. Such continuity is interesting in light of the apparent trend towards the formation of chiefdom type polities in the millennium before Contact with Europeans. Changes in the direction of greater social complexity apparently do not coincide with an intensification of the exploitation of marine resources. The implications this may have for the assessment of assumptions about subsistence practices in complex societies will be discussed.

Fitzhugh, William and Stephen Loring (Smithsonian)

[19] CAINE'S LAND IS LABRADOR: NOT MUCH EARTH, BUT GREAT ARCHAEOLOGY

Two decades of research from the Strait of Belle Isle to Cape Chidley has shown Labrador to be anything but the sterile landscape described by Cartier as "the land God gave to Cain". This paper reviews the prehistory of Labrador from the waning glacial ice to the coming of Moravian missionaries, with highlights on development of complexity in the Maritime Archaic, the appearance of the first Eskimos, and cultural and environmental interactions leading to the modern cultures of Innu and Inuit in the 20th century.

Forbes, Hamish (Nottingham)

[76] SETTLEMENT PATTERNS IN THE METHANA PENINSULA, GREECE: ARCHAEOLOGICAL THEORY AND ETHNOGRAPHIC REALITY

A modern settlement pattern is compared with archaeological theories concerning settlement location in Greece, focussing especially on theories assuming economic rationality. Household-level decision-making is highlighted in the ethnographic study, in comparison with archaeological theories which assume decisionmaking at the "site" level.

At the intra-“site” level, ethnoarchaeology can contribute to the archaeological interpretation of artifact scatters. At the inter-“site” level, historical and natural environmental factors affecting present-day settlement location are identified, but the effects of a pre-existing religious landscape on the settlement pattern may have been dominant.

Ford, Anabel (California-Santa Barbara)

[75] ORGANIZATION OF DOMESTIC ACTIVITIES IN THE MAYA AREA: THE INITIAL RESULTS OF INTENSIVE EXCAVATIONS IN THE BELIZE RIVER AREA

Intensive excavations of small and large residential units in the valley, foothills, and uplands of the Belize River area reveal the nature and variety in domestic occupations of the ancient Maya. Distinctions in construction, activities, and wealth were evident particularly by land form zones, but also by size. Only half of the excavated units exhibited indications of permanent occupation.

Manufacturing specialization was focused at foothill units, producing household items of local cherts, and upland elite units, involved with obsidian blade production. This paper offers a picture of domestic activities of the ancient Maya and offers explanations of the patterns.

Ford, Richard (Michigan) [Discussant 90]

Fortier, Andrew (Illinois)

[106] ASPECTS OF MISSISSIPPIAN BUSK CEREMONIALISM AND COSMOLOGY FROM THE CAHOKIA PRECINCTS

Excavations at the Sponemann site, located only 4 kilometers northeast of the Cahokia site, have revealed a unique Mississippian ceremonial center which served as a specialized "busk" ground. This interpretation is based on the recovery of an atypical constellation of Stirling phase pits and structures, a specialized archaeobotanical assemblage and a variety of exotic artifacts, including ritually killed bauxite figurines. The female figurines exhibit important elements of Mississippian cosmology. The sun/solstice house alignments and ritual killing of several artifacts indicate possible regulation of "hinterland" harvest rituals by Cahokia itself.

Fowler, Don and Nancy Parezo

[63] MAYANS IN CHICAGO, MOUNDBUILDERS IN BUFFALO; ARCHAEOLOGY AT WORLD'S FAIRS, 1876-1915

Archaeological exhibits were features of world's fairs in Europe and the United States between 1876 and 1915. Exhibits ranged from artifact-filled cases through scale models, to full-size replicas of major sites, or portions thereof. Exhibitors included private collectors, commercial companies, museums and national governments. Exhibits are discussed in the contexts of then-current archaeological and museological concepts, and in terms of world's fairs as expressions of European and American imperialist ideologies.

Fowler, Melvin

[0] EARLY MISSISSIPPIAN CAHOKIA: WOODHONGOS, MOUND 72, AND THE FOUR QUARTERS OF THE WORLD

Cahokia was a large, planned community in Early Mississippian times (\pm 1000 A.D.). Monumental public architecture, Platform Mounds, Piazas, Woodhenges, and elite burial areas all attest to this. Incorporated in these monuments and in the overall pattern of community organization are the world view concepts held by early Cahokians. Artifactual data indicates direct links with peoples from the four quarters of the Cahokian physical world.

Fowler, William (Vanderbilt), Kathryn Sampeck (Tulane) and Howard Earnest (Earth Search Inc.)

[13] THE CERAMIC SEQUENCE AT TACUSCALCO, EL SALVADOR

Recent archaeological research at Tacuscalco, western El Salvador, has resulted in the definition of a cultural sequence beginning in the Early Middle Preclassic and continuing into the Colonial period. The region was probably largely abandoned during the Early Classic due to the eruption of Ilopango volcano. Population increased in the Late Classic with affinities to the Zapotitan Valley. A number of new ceramic types appear to be linked with the Pipil. The Spanish Conquest resulted in pronounced changes in ceramic technology as well as the introduction of a number of new ceramic groups.

Fowler, Peter (New Castle upon Tyne)

[44] RURAL PASTS FOR A MULTICULTURAL PRESENT

Culture clash inherent in heritage interpretation needs to be identified and characterized, not ignored or deplored, it can then be mitigated and, more positively, exploited in more sensitive, effective, interpretation. But what are the premises and objectives of such a creation? The question is especially relevant in cultural resource interpretation for multi-cultural consumption as distinct from that in any one minority group. Answers are sought in the context of the rural cultural resource which presents a particular set of interpretive issues, especially in relation to a global audience, composed not only of multi-ethnic groups but also of individuals variously acculturated, motivated and educated.

Fox, Gregory (Mesa Verde National Park)

[22] A CRITICAL EVALUATION OF THE INTERPRETIVE FRAMEWORK OF THE MISSISSIPPI PERIOD IN SOUTHEAST MISSOURI

A critical review of the interpretive framework of the Mississippi period in the southeast Missouri reveals that many currently held interpretations do not stand up to detailed scrutiny. Phase designations originally proposed in the 1950s remain almost unchanged today. Statistical evaluations using

Brainerd-Robinson's coefficient of similarity and other statistical measures demonstrate that sites assigned to individual phases on the basis of the composition of their ceramic assemblages are not cohesive units of archaeological remains. Cluster analysis of Brainerd-Robinson coefficients consistently fail to derive clusters related to the individual phases. This study indicates that, using existing ceramic horizon markers, any assignment of archaeological components to current phases is tenuous given server problems with assemblage sample sizes and intragroup variation in ceramic assemblages.

Fox, John (Harvard)

[97] EXCAVATIONS AT A LATE PRECLASSIC BALLCOURT COMPLEX IN THE DEPARTMENT OF YORO, HONDURAS

This paper presents the results of two seasons of excavations at a Late Preclassic ballcourt complex in the Cataguana valley of central Honduras. This ballcourt is the earliest documented example of this architectural form in Honduras, and is contemporary with the earliest known ballcourts of the Maya Lowlands. The occurrence of a ballcourt at this early date in a region east of the traditional boundary of Mesoamerican challenges the assumptions of core-periphery models of interaction on the southeast Mesoamerican periphery. The results of excavations aimed at understanding activities in and around the ballcourt complex will be discussed.

Francis, Julie (Wyoming Transportation Department) and Mark Miller (Office of the Wyoming State Arch)

[11] THEY AREN'T JUST FORAGERS ANYMORE: NEW PERSPECTIVES ON EARLY ARCHAIC ADAPTATION IN THE UPPER GREEN RIVER BASIN, WYOMING

48SU1006 is a stratified Early Archaic site in the upper Green River Basin three levels ranging in age from 6200 to 4700 years B.P. The most spectacular is a 5800 year old pronghorn kill and processing area containing at least 12 animals and over 150 projectile points. The other levels contained debris from point manufacture and plant processing. Previous evidence for the Early Archaic suggests a "foraging" subsistence base including small game and plants. 48SU1006 provides a more complete understanding of paleoenvironmental conditions and mid-Holocene adaptations, including procurement of big game, than has yet been documented for the Plains/Intermountain regions.

Frankenburg, S. (see Konigsberg, L.) [59]

Franzen, J. (see Martin, T.) [108]

Freeman, Andrea (Arizona)

[113] GEOCHRONOLOGY OF THE BOYD PALEOINDIAN SITE, WESTERN KENTUCKY

During September of 1992, subsurface trenching of the Boyd Paleoindian site was conducted. The trenching revealed a 13,000 yr. old stratigraphic sequence of alluvium. This sequence is discussed as well as its relationship to the Paleoindian (Clovis) site on the terrace surface, and the implications for Paleoindian site chronology in the eastern United States.

Freidel, David (Southern Methodist) [Discussant 57]

Fritz, Gayle (Washington)

[8] THE VALUE OF ARCHAEOLOGICAL PLANT REMAINS FOR PALEODIETARY RECONSTRUCTION

Macrobotanical remains have been considered relatively poor indicators of diet due to the complexities of differential deposition and preservation. In spite of these problematic factors, paleoethnobotanical studies are crucial for understanding prehistoric subsistence. Paleofeces, though limited to special context, remain the best direct source of information about plant consumption. Although flotation-recovered assemblages of carbonized plant parts from open sites do not reveal proportions of specific food sources in the diet, they do allow interpretation of chronological trends and regional variations. This potential can be demonstrated using recent studies from eastern North America, where macrobotanical remains provide key information concerning agricultural evolution that stable carbon isotope research has failed to detect.

Fry, Robert (Purdue)

[5] CHRONOLOGIES AND THE CERAMICS OF INTENSIFICATION

Excavations in the raised fields at Pultrouser Swamp, Belize produced artifacts including ceramics in varying degrees of preservation. Comparison of the assemblages from the raised fields confirms the artificial nature of these constructs. Typological and paste comparison allows for chronological placement of some of the raised fields.

Gal, Robert (National Park Service-Northwestern Alaska Areas)

[46] EARLY OCCUPATION OF THE UPPER NOATAK RIVER BASIN, NORTHWESTERN ALASKA: PROBLEMS, PROSPECTS, PROGNOSIS

The National Park Service, U.S. Geological Survey and Smithsonian Institution conducted reconnaissance survey in 1992 of geomorphic features associated with Glacial Lake Noatak (GLN). Formed when glaciers in the DeLong Mountains dammed the Noatak River during the Pleistocene, GLN affected the Pleistocene paleogeography of northwestern Alaska and also influenced early Holocene to modern environments. Over 90 new archaeological sites were identified; at several, core and blade technology is apparently associated with well-formed lanceolate projectile points. Findings suggest that the pre-4,100 B.P. record at the halcyon Onion Portage Site on the Kobuk River may not be informative of even adjacent drainages.

Gall, Daniel (UNC-CH)
[102] GREENSTONE ARTIFACTS AT THE MOUNDVILLE SITE, ALABAMA: PETROGRAPHY AND PROVENANCE

One artifact type commonly associated with the Moundville site in Alabama is the "greenstone" petaloid celts. Although celts were made from rock types that vary greatly in colors and textures, the majority are composed of an actinolite-epidote-abite-chlorite greenschist (metabasite) probably obtained from the Hillabee Formation. Preliminary field evidence suggests that the main sources of this "greenstone" are located in Clay and Chilton Counties, Alabama.

Garber, James (Southwest Texas State), David Driver and Lauren Sullivan
[75] MEDIUM SIZED CEREMONIAL CENTERS IN THE BELIZE VALLEY: THE BLACKMAN EDDY EXAMPLE

The site of Blackman Eddy was initially occupied in Middle Preclassic times, and emerged as a medium sized center in the Early Classic. It exhibits all of the formal features of the large Classic Period centers in the Valley including multiple plazas, palaces, a ballcourt, temple mounds and a carved stela. Unlike the large centers, its tallest mound reaches a height of only 10 meters. The survey has recorded sites that alter the traditional view of settlement in the Valley. These data pose new questions and problems in the interpretation and reconstruction of the Belize Valley sociopolitical systems.

Gargett, Robert (California)
[64] THE SPATIAL ANALYSIS OF HOMINID FAUNAL ACCUMULATIONS: THE VIEW FROM POD HRADEM, A CAVE BEAR (*URSUS SPELAEUS*) LOCALITY IN CZECHOSLOVAKIA

To understand human behavior archaeologists may employ spatial analyses of faunal remains, often with the implicit assumption that non-random patterns denote intentional, or culturally mediated acts. To date, no systematic observations of the spatial parameters of non-hominid bone accumulations have been gathered to assess the validity of this method for inferring the behavior of non-modern hominids. A sample of cave bear (*Ursus spelaeus*) fossils from Pod hradem, Czechoslovakia, was examined to see if any spatial patterns existed, and if so, to infer the processes by which they came to be.

Garza-Valdes, Leontio
[36] BIOGENIC VARNISH ON ANCIENT POTTERY AND STONE ARTIFACTS

The manganese and iron rich natural coatings deposited on ancient rocks (rock varnish) and ancient pottery, were studied on artifacts from Guatán, Guatemala, and from Michoacan, Mexico. These deposits were analyzed using: bacterial and fungal culture media, energy dispersive X-ray spectroscopy, Fourier-Transform infrared spectrography, optical microscopy, polarized light microscopy, scanning electron microscopy, ultraviolet fluorescence, wavelength dispersive spectroscopy, and wet chemical reactions.

The different components in the two types of natural accretions are described. The coatings on ancient pottery were richer in manganese. Several bacterial groups and microcolonial black fungi (MCF) were found encapsulated in the varnish.

Gasco, J. (see Moore, J.) [11]

Gebauer, Anne (Wisconsin-Madison)

[104] EARLY POTTERY IN NORTHERN EUROPE

The emergence of pottery production in Northern Europe appears to precede the adoption of domesticates by several hundred years. This paper will investigate the temporal and geographical spread of these ceramics, the interrelations between the late hunter-gatherer societies and the Linear Band Ceramic (LBK) societies, and the changing role of pottery in society before and after the transition to food production. Specific focus of the paper will be on Southern Scandinavia.

Gerlach, C. (see Mason, O.) [46]

Giesen, M. (see Scuilli, P.) [91]

Giesen, Myra (Ohio State)

[91] ACQUIRED DENTAL PATHOLOGIES IN A SAMPLE OF THE MADISONVILLE COLLECTION

Dental caries (60 individuals, 2572 teeth), abscesses, and antemortem tooth loss (82 individuals, 4588 loci), are evaluated for a sample from the Madisonville collection as biocultural markers of diet and nutrition. The results are compared to Ohio Archaic through other Late Prehistoric populations in Ohio and Pennsylvania. The general pattern of dental disease suggests an agricultural subsistence base; however, the relatively low frequency of caries observed for Madisonville may best be explained due to ecological differences.

Gifford-Gonzalez, Diane (California-Santa Cruz)

[7] SITE STRUCTURE AT FUNCTIONALLY DISTINCT LOCALES: AN ETHNOGRAPHIC EXAMPLE FROM THE DASSANETCH OF KENYA

Dassanetch of northern Kenya feed themselves through pastoralism, horticulture, fishing, hunting of lacustrine vertebrates, and scavenging, in differing combinations, according to household composition and fortunes, location of key resources, and temporal variations in the resource base. Each strategy requires different mobility, personnel and labor allocations, and extractive tactics. On-the-ground patterns of features, implements, manufacturing debris, and food refuse at sites of differing economic functions reflect variations in these factors. The relationship of human behaviors to site size and "activity areas" and other types of clustering is explored.

Gilead, Isaac (Ben-Gurion University-Israel)

[110] LONG-DISTANCE CONTACTS OF THE GHASSULIAN CULTURE OF SOUTHERN PALESTINE

Appreciating the long-distance contact is a major methodological problem in the study of the culture history of southern Palestine during the fifth-fourth millennium. In general, the overall artifactual evidence suggests that the foreign relations of the Ghassulian were limited. However, recent research indicates that relations with provinces in the northern Levant did exist, although their impact on the Ghassulian was minimal. Only after the Ghassulian disappeared did the Egyptian influence become a crucial factor in determining the cultural history of Palestine.

Gilman, Antonio (California-Northridge) [Discussant 21]

Gilpin, Dennis (SWCA Environmental Consultants)

[103] HISTORIC PERIOD COLONIZATION OF THE NORTHERN CHACO PLATEAU, NORTHWESTERN NEW MEXICO

Secondary frontiers occur when areas that have been previously bypassed are rendered habitable by technological innovation. In the late 1800s and early 1900s, improvements in transportation and water sources allowed both Navajos and EuroAmericans to fully exploit for the first time the grasslands of the northern Chaco Plateau in northwestern New Mexico. The Navajo and EuroAmerican adaptation to this situation was documented by the archaeology of the Navajo Indian Irrigation Project, for which 84,398 ha were inventoried, 1049 historic Navajo and EuroAmerican components were recorded, and 75 historic components were excavated.

Givens, Douglas (St. Louis)

[63] THE BOWDITCH CHAIR, MAYAN ARCHAEOLOGY, AND THE PEABODY MUSEUM OF ARCHAEOLOGY AND ETHNOLOGY: PHILANTHROPY AND INSTITUTIONAL HISTORY IN THE DEVELOPMENT OF AMERICANIST ARCHAEOLOGY

The Bowditch Chair and the Peabody Museum of Archaeology and Ethnology (Harvard University) are seen as having a central role in the development of Mayan and Americanist archaeology. The Bowditch Chair added a new dimension to the focus of the Peabody Museum in its work in the Americas. Key figures as George Peabody, Alfred Tozzer, and Gordon Willey and their roles are discussed with reference to the Bowditch Chair and the Peabody Museum's role in the development of Americanist archaeology.

Glowacki, Donna, Christopher Turnbow and Ronald Fields (Dayton Museum of Natural History)

[91] NEW PERSPECTIVES ON THE FORT ANCIENT CERAMICS OF THE MADISONVILLE SITE, SOUTHWESTERN OHIO

In the 1930s, ceramic recovered from Madisonville in southwestern Ohio were used to construct the "Madisonville Focus" of the Fort Ancient Aspect. Recent investigations of the site produced

tightly dated, stratified deposits that indicate the "focus" compressed over four centuries of Fort Ancient cultural development into a single undifferentiated until dating between A.D. 1200 and the 1600s. The ceramic research discussed in this paper utilizes the recently recovered evidence in order to clarify the Fort Ancient ceramic sequence of the site and to offer new insight on the protohistoric Fort Ancient ceramic assemblages of the region.

Glowacki, Mary (Brandeis University)

[12] MIDDLE HORIZON CERAMICS FROM CUZCO, NEW INSIGHTS ON THE WARI OCCUPATION

Until recently the Wari occupation of the Valley of Cuzco has been interpreted primarily on the basis of excavations at the site of Pikillacta and in its immediate vicinity. An analysis of ceramics from Pikillacta and other Middle Horizon sites in the Cuzco region offers a broader perspective on Wari presence and local interaction. Certain categories of pottery indicate a direct link to the Wari heartland and the administrative compound of Moraduchayuq. In contrast, a wide array of distinctly local styles—which appear in surprisingly small percentage at Pikillacta—are found throughout Cuzco. Findings suggest a more complex political setting for Middle Horizon Cuzco than previously proposed.

Goebel, T. (see Hoffecker, J.) [19]

Goebel, Ted (Alaska-Fairbanks)

[64] CHARACTERIZING THE SIBERIAN MIDDLE-UPPER PALEOLITHIC TRANSITION

The Middle-Upper Paleolithic transition in Siberia was abrupt and widespread. Middle Paleolithic industries are typically Mousterian with low Levallois indices; new AMS 14C dates suggest ages of >40 kya. The opening phase of the Upper Paleolithic (42-35 kya) is characterized by blade and biface lithic industries, bone implements, pendants and mobiliary art, and large open-air settlements. These shifts in technology, organization, and land use signal the emergence of modern human behavior in northern Asia.

Goldstein, Paul (American Museum of Natural History)

[12] FROM BANDELIER'S CEMETERIES TO A BLACKWARE HORIZON, ONE STEP TOWARDS A TIWANAKU CERAMIC CHRONOLOGY

Despite ambitious advances in the archaeology of the Tiwanaku civilization, its ceramic sequence is still treated like pornography: no one can define it, but everyone "knows it when they see it". The lack of an explicit chronology for seven centuries of Tiwanaku's high ceramic tradition inhibits understanding of this important early state society.

Specific blackware serving vessels comprise a regionally and chronologically diagnostic component of the Tiwanaku ceramic inventory. Ceramics from Bandelier's cemeteries of Ciriapata and Titinuyani, and from excavations in Tiwanaku, Moquegua, Peru and Azapa, Chile are compared to define spatial and temporal limits for a "blackware horizon" that constitutes one building block for a refined Tiwanaku sequence.

Gordon, Bryan (Canadian Museum of Civilization)

[11] THE EFFECT OF HERD-FOLLOWING ON MATERIAL CULTURE

The Beverly caribou range is triangular, with base extending from the Churchill River of northern Saskatchewan 1000 km to its calving ground apex near the Back River south of the Arctic Ocean. Each spring since deglaciation, caribou follow the tundra migration route to calve in late May and early June. After 4-6 weeks to post-calving aggregation they and their calves are joined by late arriving bulls, the huge combined herd moving south in late summer past treeline. After a brief forest sojourn the herd ruts in October at treeline before returning to the forest for winter. In summer, autumn and winter, it is hunted for its meat, hide, sinew, bone and antler. Using 1000 human occupations north and south of treeline, the relationship between toolkits and seasonal activities is evaluated.

Gose, W. (see Takac, P.) [28]

Gosser, D. (see Clark, J.) [104]

Graham, Elizabeth (York) and David Pendleton (Royal Ontario)

[13] NEW DATA FROM AMBERGRIS CAYE ON COASTAL INTRASITES PRODUCTION AND EXCHANGE

The Maya Coastal Archaeology Project conducted two visits to Belize in 1992: Marco Gonzalez, at the caye's southern tip, and Señor Corte, a larger, higher-elevation with extensive architectural remains. The Señor Corte archaeological results clearly confirm the use of Marco Gonzalez, with

a long and robust occupation through Middle Postclassic times and without the flourishing Late Postclassic and early Historic Period activity exhibited by the San Pedro Village sites. Details of Maya production and processing activities at both sites are being illuminated by mineralogic analysis; other techniques are also being applied to assess anthropogenic soil formation processes.

Graham, Russell (Illinois State Museum)

[55] EVOLUTION OF MAMMAL COMMUNITIES IN THE CENTRAL MISSISSIPPI RIVER VALLEY AND PLEISTOCENE/HOLOCENE HUMAN SUBSISTENCE STRATEGIES

Late Pleistocene mammal communities of the Central Mississippi River Valley are characterized by megafauna and contemporaneous sympatry of small mammal species without modern analogs. At the end of the Pleistocene, most megafauna species, which served as potential resources for human populations, became extinct. Also, at the same time, modern mammal community patterns began to emerge through the individualistic response of species to changing environmental conditions, primarily global warming. Both the extinction event and the reorganization of mammalian communities may have resulted from changes in patchiness of the environmental mosaic. Consequences for human subsistence strategies would have been shifting resource bases and reduced mobility during the transition from Paleoindian to Archaic economies.

Grantham, Bill (Northwestern)

[89] CUISINE: AN ALTERNATIVE APPROACH TO EVALUATING CARCASS PART DISTRIBUTION

Many models of carcass part distribution applied to faunal samples in the Near East assume that ancient value systems placed on carcass parts are efficiency based. These models equate higher meat yields per carcass part with higher value. An emic approach to this problem, based on recent ethnographic data from Druze villagers, reveals that efficiency has little to do with valuation. When cultural values such as consumer preference, cooking methods, and the cultural implications of food consumption are considered, the resulting model of carcass part distribution differs markedly from efficiency based models.

Graumlich, L. (see Mason, O.) [46]

Greber, N'omi (Cleveland Museum of Nat History)

[59] CONSIDERING SOME POSSIBLE ECOLOGICAL, SOCIAL, AND POLITICAL BOUNDARIES AMONG THE OHIO HOPEWELL PEOPLES

This study will mainly consider the area defined by the group of tributaries of the Ohio River from the Great Miami, upstream to the Muskingum. Major and minor sites associated with the Middle Woodland time period Hopewell phenomenon occur within this area and make up the mosaic commonly called Ohio Hopewell. Some comments on possible ecological, social, and political aspects of this mosaic will be made, based on some of the differences and commonalities which appear in the cultural remains. These comments must be made within the presently severely limited knowledge of the time sequence of these cultural remains.

Green, Roger (Discussant 70)

Green, William, Douglas Jones and Clare Tolmie (Iowa)

[90] LATE PREHISTORIC AND PROTOHISTORIC PLANT USE ON THE EASTERN PLAINS: NEW EVIDENCE FROM WESTERN IOWA

Three studies provide new information on the plants which supplemented maize among sedentary food-producing groups on the eastern Plains. A Nebraska phase earthlodge (ca. AD 1000-1100) contained the first reported *Hordeum pusillum* (little barley) in the region. Samples from two Mill Creek sites (ca. AD 1100-1300) produced domesticated *Chenopodium* and *Iva annua*. At a protohistoric, largely Oneota, site (A.D. 1600-1700), non-domesticated *Iva xanthifolia* and *Elymus canadensis* (wild rye) were abundant. These studies underscore the continued importance of native cultigens on the eastern Plains until a protohistoric reversion to non-domesticated types and species.

Greenwald, Dawn (SWCA)

[107] THE INTERPRETATION OF INTRA-SITE ECONOMIC STRATEGIES BASED ON THE DISTRIBUTION OF GROUND STONE ARTIFACTS

Hohokam ground stone studies recently have noted these artifact's interpretive potential of intra-site resource procurement strategies, activities, and general subsistence strategies. These capabilities are reviewed based on the most recent studies and evaluated for their usefulness in detecting changes within site economic systems. Research conducted at the City of Phoenix Sky Harbor Center provides examples for using ground stone artifacts to document changes in resource procurement and subsistence strategies based on intra-site temporal distributions.

Greer, J. (see Greer, M.) [38]

Greer, John (Missouri-Columbia)

[38] SOME PRELIMINARY OBSERVATIONS ON THE PAINTED ROCK ART OF SOUTHWESTERN VENEZUELA

Cave paintings along the Orinoco may be attributable mostly to local Sálica antecedents and may date about 6000 bc to modern. A style sequence based on superposition equates mostly with color and pigment type: light red hematite earliest, plain red vegetal paints next, then red and white bichrome, and finally a dominance of white kaolin. Motifs mostly relate to fertility, creation time, and shamanic experiences. Mazes and geometric blankets may be ethnically linked; some motifs (e.g., outlined cross) may represent widespread beliefs or concepts. Paintings predate modern Indians although groups still have strong beliefs related to the art.

Greer, Mavis and John Greer (Missouri-Columbia)

[38] SHAMEN IN THE PICTOGRAPHS OF THE SMITH RIVER DRAINAGE IN CENTRAL MONTANA

A variety of shaman figures occurs in sites along the Smith River and its western tributaries. Although shaman figures are not frequently portrayed in the pictographs of central Montana, shamanistic activities have long been considered the reason for the existence of the Central Montana Abstract pictographic style. In the Smith River area styles of shaman vary within and between sites and include simple representations with stick-figure men as the basis of the motif to elaborate stylized human arms and hands denoting the shaman. Shaman motifs are examined relative to their potential for representing different groups, time periods, and functions.

Gregonis, L. (see Slaughter, M.) [107]

Greiser, S. (see Greiser, T.) [3]

Greiser, Sally (Historical Research Associates)

[3] THE SACRED LANDSCAPE OF TAOS

Taos Pueblo ancestors have farmed the Taos Valley for nearly a millennium. Their ancient religious practices involve springs, lakes, mountain tops, rock formations, and other features of the natural landscape, many of which are not on Pueblo lands and have been destroyed or are being desecrated. The Taos Blue Lake case is well-known, and smaller, less publicized battles for sacred sites continue to be waged. One current case involves archaeology for physical documentation of traditional cultural practices.

Greiser, T. Weber and Sally Greiser (Historical Research Associates)

[3] SACRED LANDS AND TRADITIONAL CULTURAL PROPERTIES: TWO WORLD VIEWS

U.S. Forest Service lands situated between the Blackfeet Reservation and Glacier National Park, have been examined for archaeological sites and Traditional Cultural Properties, under National Register Bulletin 38 guidelines, in response to potential impacts from proposed drilling for natural gas. These studies brought two very different world views into conflict; essentially, one focused on the spiritual and the other on the material realm. Legislation reflects a non-Native world view to deal with Native sacred lands. If full implementation of Bulletin 38 is allowed by agencies, it can serve as a bridge between these realms.

Grieder, T. (see Malina, R.) [9]

Griffin, J. (see Shimada, I.) [12]

Griffin, James (Smithsonian) [Discussant 59]

Griffin, Kristin and Walt Allen (Gallatin National Forest, Livingston Ranger District)

[2] A STRATIFIED SITE IN THE UPPER YELLOWSTONE VALLEY: A GREATER UNDERSTANDING ACHIEVED WITH THE CONTRIBUTION OF VOLUNTEERS

Test excavations conducted by Forest Service archeologists with the assistance of Passport in Time volunteers provided a glimpse into the Eagle Creek Site necessary to guide future research there. The site is located on the Gallatin National Forest in the Upper Yellowstone River valley, and was known to have stratified deposits dating from the last 4,000 years, including well-preserved bone and one of the most extensive collections of ceramics in the region. This season's testing produced a refined picture of stratigraphic relationships and natural formation processes across the site, additional ceramics, bone, and several features.

Griffiths, David (Durham)

[77] TRADE, TERRITORIES AND POWER IN WESTERN BRITAIN AND IRELAND, AD 400–1000

Ireland and the western periphery of Britain were characterized by a network of Celtic kingdoms with documented territories, laws and traditions of kingship. The regional significance of their

economic foci was eclipsed by the advent of Anglo-Saxon and Anglo-Scandinavian urbanism in the 10th C. Economic and territorial changes are indicated partly by variations in external trade but mainly by departures in the pattern and scale of land-use.

Grimm, Eric (Illinois State Museum)

[55] LATE QUATERNARY VEGETATION AND CLIMATE CHANGE IN THE CENTRAL MISSISSIPPI RIVER VALLEY

Although the Central Mississippi River Valley has experienced significant late-Quaternary climate and vegetation changes, the magnitude and timing of these changes are not very well understood. Recent evidence indicates that the prevailing model for the middle-Holocene warm/dry "Hypsithermal" is inappropriate. Rejection of this model forces re-evaluation of the evidence for Holocene climate events, which must be consistent with possible atmospheric circulation scenarios.

Griswold, William (Harvard/Smith)

[110] INTERACTION BETWEEN EGYPT AND MESOPOTAMIA IN THE LATER HALF OF THE FOURTH MILLENIUM B.C.

Archaeological evidence documents that inter-regional interaction took place between Mesopotamia and Egypt in the later half of the fourth millennium B.C. This archaeological evidence has been interpreted differently by various scholars. Some contend that the evidence represents nothing more than trade between the two regions, while others have argued that the evidence indicates the diffusion of the state to Egypt. Using archaeological evidence, as well as new data derived from mortuary studies, this paper attempts to assess the influence of Mesopotamia on the development of the Egyptian state.

Grove, David (Illinois)

[49] UPLAND OLMEC: RETHINKING SITE AND RESOURCE DISTRIBUTION IN THE OLMEC REALM

Olmec research has historically focused on the eastern riverine centers of La Venta and San Lorenzo. In contrast, this paper discusses the extensive western upland Olmec zone and recent research there near Laguna de los Cerros. With that foundation, the paper then examines the significant ecological and geological diversity which exist across the Olmec realm and the location of major Olmec sites within that diverse landscape. The possibility that each Olmec center was situated to control a distinctive set of resources is considered and the implications for Olmec political economy discussed.

Grover, Jennifer (Alabama)

[98] THE FAUNAL REMAINS FROM DUST CAVE, ALABAMA

Test excavations at Dust Cave, in Northwest Alabama, have revealed four meters of deposits that cover the Early (10,500–8,000 B.P.) and Middle (8,000–6,000 B.P.) Holocene. One of the unique features of these deposits lies in the fact that they contain the largest faunal collections, for these periods, in the Middle Tennessee Valley. The faunal analysis sheds considerable light on the subsistence and settlement changes that occurred between the Early and Middle Holocene.

Guillen, S. (see Wise, K.) [12]

Gums, Bonnie (Illinois-Eduardsville)

[106] THE HISTORIC OCCUPATIONS OF THE AMERICAN BOTTOM REGION

This paper will present an overview of the historic occupations of the American Bottom in terms of settlement patterns, demographics, and political influences. Utilizing historical documents, early cartography, and archaeological data, the temporal focus will be on the contact and colonial periods of the late 1600s and early 1700s to the nineteenth century.

Guthrie, R. Dale (Alaska)

[25] THE MAGICO-RELIGIOUS PARADIGM AND ITS EFFECT ON THE INTERPRETATIONS OF PALEOLITHIC ART

The interpretation of a "creative explosion" accompanying anatomically modern peoples (AMP) in Europe around 40,000 years ago accepted a phylogenetic heritage from Neanderthals. More recent evidence suggests that AMP (osteologically) originated much earlier outside Europe. The arrival of AMP taphonomically created the appearance of an explosion. Rather, the change was possibly more gradual, the most explosive cultural change being at the start of the Holocene. Our image of the magico-religious functions of the Paleolithic art obscure this profound shift from empirical-based Paleolithic reality to that of Holocene tribal cultures. Visual art best exemplifies this juncture, changing from literal representational forms to more abstract symbolic patterns.

Haas, Daniel (US Forest Service-Shawnee Forest)**[108] WHO'S BURNING THE FOREST? A DISCUSSION OF NATIVE AMERICAN-SET FIRES IN THE MIDWEST**

Ecological restoration, in part, emphasizes the role of human-induced fire in shaping the forest landscape. To support restoration as a management tool the extent and purpose of fire use by Native Americans is portrayed similarly across cultural and geographical areas. These generalizations demonstrate a poor understanding of cultural diversity across time and space. An overview of available information from the Midwest is provided to begin understanding the complex relationships between Native Americans and forest fire.

Haas, Jonathan (Field Museum of Natural History) [Discussant 86]

Habu, Junko (McGill)**[4] SUBSISTENCE-SETTLEMENT SYSTEMS IN THE MOROISO PHASE, EARLY JOMON PERIOD**

Archaeologists have assumed that the Jomon people were sedentary inhabitants of large villages which were occupied throughout the year. Recent developments in Jomon studies, however, have led some archaeologists to question this conventional assumption. This paper uses settlement data dating from the Early Jomon Moroiso phase (ca. 5,000 B.P.) in eastern Japan to reevaluate this assumption of Jomon sedentism. The residential mobility of the Moroiso phase people will be examined through an analysis of intersite variability and site location. The results will be discussed in the context of hunter-gatherer subsistence-settlement models in ecological anthropology.

Haesaerts, P. (see Straus, L.) [64]

Hagstrum, Melissa (Washington)**[105] CRAFT ECONOMIES AT THE EMPIRE'S FRONTIER: CERAMIC TOOLS FOR INKA AND SANTA MARIANA METALLURGY**

Important effects of Inka conquest and colonization throughout the Andes involved social, economic, and demographic changes, traceable through craft technologies and organizational structures. Insight into Inka impact on indigenous craft production strategies may be had by contrasting craft activities at local indigenous sites with those at state administrative sites. Investigation into sets of ceramic tools used in metallurgy suggest that even for imperial activity, local labor and local technologies provisioned the state's needs for display and bureaucratic goods. Research highlights an integrative approach to craft studies, here ceramics and metallurgy, for understanding societies.

Hajic, E. (see Woods, W.) [106]

Hajic, Edwin (Illinois State Museum)**[43] HOLOCENE LANDSCAPE EVOLUTION AND THE UPLAND ARCHAEOLOGICAL RECORD: MODELING AND TESTING**

Intermediate scale distributions of prehistoric cultural debris in Midwestern dissected uplands have been interpreted explicitly or implicitly solely as the product of cultural behavior or modern agricultural practices. A model of Holocene upland landscape evolution is constructed that can account for the generally perceived spatial and temporal intermediate scale upland patterns of cultural deposits. The model is based on 1) timing of erosion on upland slopes identified from regional episodes of colluvial footslope sedimentation and soil evolution; 2) elemental hillslope components of Ruhe (1969); 3) soil-geomorphic relationships; and, 4) inferred development of Holocene erosion surfaces and associated, spatially discrete, processes on spur or interfluvial hillslope components. Preliminary survey results are examined.

Hajic, Edwin (Illinois State Museum)**[55] LATE QUATERNARY GEOMORPHIC CHANGE IN THE CENTRAL MISSISSIPPI RIVER VALLEY**

Central Mississippi River paleochannel patterns record spatial and temporal changes in valley environments and resources. They reflect a history that ought to have influenced settlement location, preservation and integrity of prehistoric cultural deposits. Below the Missouri River mouth, after a change from braided to meandering, the Mississippi River episodically decreased in sinuosity and migrated westward. In contrast, above the Missouri, the Mississippi maintained a braided to island braided pattern for much of the Holocene. In addition to climate, late deglacial history, regional tilting, and changing rates of sediment yield within the basin were important factors influencing Mississippi River evolution.

Haley, S. (see Malinowski, L.) [35]

Haley, S. (see Cunningham, J.) [83]

Hall Jr., Edwin (SUNY-Brockport)**[46] WHAT, WHEN, HOW, WHO, AND OTHER ARCTIC MYSTERIES**

Excavations of NW Arctic Alaskan sites resulted in the recovery of 38 microblade cores from various locales. Most are small, narrow, and wedge shaped, while others lack these characteristics. Colors vary from green-gray, maroon, and gray (Upper Siksikpuk) to mostly black, black-brown or dark gray (Tulugak Formation). Tulugak chert is of the highest quality but is less often used. Is it easier to create blades from one or are those from another superior? Is Siksikpuk easier to procure than Tulugak? Some specimens from Arctic surveys defy identification by function, cultural assignment, or approximate dating under accepted conventions. Several examples will be presented.

Hall, R. (see Demel, S.) [33]

Hall, Robert (Illinois)**[0] EXCAVATING FOSSIL METAPHORS AT CAHOKIA**

Archaeological excavations at Cahokia and within the Cahokia community have produced evidence of prehistoric ritual activity and symbolic formations with fascinating parallels in Mesoamerica i.e. ritual relating to the sun (Tonatiuh), the Green Corn Goddess (Xilonen), the Flayed God (Xipe Totec), and the morning star (Tlahuizcalpanteuctli). The examples discussed will be those for which there are parallels as well in the practices of ethnographically known tribes that must have figured in the world of the Cahokians.

Hall, Robert (Illinois)**[16] CAHOKIA, CAMELOT AND THE DYNAMICS OF ORAL TRADITION**

Cahokia is an enormous archaeological site that in its day was the cultural capital, if not the political capital, of the Midwestern United States, but there is next to nothing in Native American oral tradition to indicate that a temple town on the scale of Cahokia ever existed in the northern Mississippi valley. By contrast, Arthur's Camelot exists more in myth than as a soundly identified archaeological site. Explanations of such paradoxes are sought in the dynamics of oral tradition as it relates to mythicized history and historicalized myth.

Hall, Susan (Northern Arizona)

[35] AN ARCHITECTURAL ANALYSIS OF CAVATE DWELLINGS IN THE VERDE VALLEY, ARIZONA

Cavate dwellings are clusters of artificial cave-like rooms. Southwest examples are on the Pajarito Plateau, NM, and Verde Valley, AZ. Verde Valley cavates have received no archaeological attention since the turn of the century. At the Mindeleff Cavate Site, no portable artifacts remain but architecture is well preserved with many intact dwellings. New data were collected for 343 rooms in 89 dwelling units. Analysis used qualitative information and scaled drawings to search for spatial patterns, this was accompanied by statistical procedures to interpret quantitative data and define trends and patterns for in-site variation.

Hally, David (Georgia)**[33] THE NATURE OF MISSISSIPPIAN TOWNS IN GEORGIA**

Only two Mississippian towns in Georgia-King and Rucker's Bottom-have been excavated extensively enough to yield evidence of overall settlement layout. Of these, only the settlement plan at King can be readily interpreted and fit into a larger regional settlement pattern context. At King, it is possible to identify: a basic household architectural complex; an emphasis on household identity and persistence through time; growth in the size of individual households through time; high status residential areas; and evidence of town planning.

Handly, Martin (Trent)

[11] RECENT INVESTIGATIONS AT CHARLIE LAKE CAVE (HBR 39): IMPLICATIONS FOR OUR UNDERSTANDING OF SUBARCTIC PALEOINDIAN PREHISTORY

Recently expanded excavations at the deeply stratified site of Charlie Lake Cave (HBR 39) in northeastern British Columbia have provided additional information concerning Palaeoindian occupations in this region. Component 1, dated to 10,500 BP, contains a multiple basally fluted chert point, stone head (previously discussed in Fladmark, Driver, and Alexander 1988), a few retouched chert flakes, and a large number of quartzite core and flake tools. Component 3, dated to 9,500 BP, contains 160 bifacial retouch flakes and a tabular chert microblade core. The implications of these two assemblages are evaluated within the context of other fluted point and microblade assemblages within the Subarctic.

Hanna, D. (see Helmer, J.) [11]

Hansell, P. (see Ranere, A.) [93]

Hansell, Patricia and Anthony Ranere (Temple)

[60] SETTLEMENT STUDIES IN LOWER CENTRAL AMERICA: PAST TRENDS AND FUTURE DIRECTIONS

Well into the second half of the 20th century, lower Central America was viewed, most often, as a conduit for trade and migration between the high cultural areas of Mesoamerica and the Andes. Archaeological research focused on the excavation of sites, oftentimes a cemetery. A shift in emphasis to regional studies began in the 1970's. Shortly thereafter, projects involved random sampling designs which provided the site distributional data necessary to examine regional settlement patterns. In this paper we (1) review the history of settlement studies in lower Central America, and (2) discuss the direction(s) in which we anticipate such studies will go to maximize their analytical and interpretive potential. By example, we refer to site survey data from the Santa Maria River drainage of Central Panama and a geographic information systems (GIS) approach.

Hanson, John, Lawrence Lesko and Neil Weintraub (Kaibab National Forest)

[2] THE ART AND ARCHAEOLOGY OF SNAKE GULCH, ARIZONA

Snake Gulch, in the Kanab Creek Wilderness Area, north of the Grand Canyon, contains one of the finest concentrations of prehistoric pictographs in the Southwest. The Kaibab National Forest has been conducting archaeological reconnaissance in the area for the last four years. In an effort to add significantly to our resource base, better understand the spatio-temporal context of the rock art and associated remains, and prepare a National Register nomination, a Passport in Time project, involving ten volunteers and eight professionals, was conducted in the fall of 1991. The results of that effort are reported in detail.

Hantman, Jeffrey and Michael Klein (Virginia)

[29] WOODLAND ERA POPULATION AND REGIONAL ORGANIZATION IN THE JAMES RIVER VALLEY OF CENTRAL VIRGINIA

Archaeological data from the James River Valley in central Virginia are summarized in order to provide some new and more detailed insights into regional population size, distribution, and political organization during the Woodland era in central Virginia. Three lines of analysis are reviewed: the merger of systematic survey data and non-systematically collected site file data to generate population estimates; the analysis of excavated and dated features in the James River Valley in a regional context; and a review of recent excavations at Woodland village sites in the floodplain and in the uplands surrounding the James.

Hard, Robert (Texas-San Antonio)

[64] THE ADOPTION OF AGRICULTURAL ECONOMIES IN SEMIARID ENVIRONMENTS

Our understanding of the adoption of farming economies in the American Southwest, the Levant, Mesoamerica, and other semiarid regions has dramatically increased in the past 15 years. However, the analysis of each case is typically treated in terms of local conditions. Are there common, underlying cultural-ecological variables present that are affecting the evolution of farming economies?

Hargrave, M. (see Stephens, J.) [82]

Harl, Joseph and Patti Wright (Missouri-St. Louis)

[106] AN EAST-CENTRAL MISSOURI PERSPECTIVE

Surveys and excavations conducted to the west of the American Bottom in St. Louis and surrounding counties have yielded information about the organization and adaptations of late prehistoric groups. Specifically, data on Late Woodland, Emergent Mississippian, and Mississippian occupations of the area will be presented. Comparative analyses with data derived from the American Bottom, allowing for a broader coverage and enhanced understanding of the geographical and temporal range of these groups, will also be given.

Harrison, Peter (Maxwell Museum of Anthropology)

[5] DATA AND INTERPRETATION

A brief examination is made of the nature of varied forms of data, the structures and their identification, which are indicative of intensive agriculture. Interpretive conclusions concerning the dating and identification are based upon much more than the soils of these structures. How does one assign priority to different lines of evidence when they are in apparent conflict?

Harro, D. (see Root, M.) [1]

Harrold, F. (see Ellwood, B.) [14]

Harry, Karen (Statistical Research, Inc.) and Mark Slaughter (SWCA, Inc.)

[51] EXPERIMENTING WITH LITHIC RAW MATERIALS: HOW ACCURATE ARE INFERENCE DERIVED FROM FLAKE COMPLETENESS CATEGORIES?

Sullivan and Rozen (1985) have proposed that lithic debitage can be classified according to one variable, flake completeness. Assemblage variations in category percentages are proposed to reflect

behavioral differences. In spite of recent applications of this technique, the accuracy of its assumptions has yet to be demonstrated. To test whether the patterning of flake categories is affected by non-technological factors, reduction experiments were conducted and the resulting debitage classified by flake-completeness category. Our results indicate that assemblage composition is partially determined by the raw material type, and call into question the accuracy of archaeological inferences derived solely from flake completeness categories.

Hart, E. Richard (Institute of the North American West)

[23] TRIBAL IDENTIFICATION OF ARCHAEOLOGY AS TRADITIONAL CULTURAL PROPERTY

The Institute of the North American West has recently completed a project with the Pueblos of Hopi, Acoma and Zuni and the Ramah Band of the Navajo Nation. The project has been carried out to ensure compliance by the Salt River Project with Section 106 of the National Historic Preservation Act during the construction of the proposed Fence Lake Mine in west-central New Mexico. Consultation with a group of tribal religious leaders, who were carefully selected for participation by each tribe or band, has indicated the ways that archaeology is traditional cultural property.

Hastings, C. (see Matos, R.) [85]

Hastings, Charles (Michigan)

[20] ASHANINKA SETTLEMENT IN THE UPPER MONTANA OF PERU

Historically, the territory of the lowland Ashaninka (Campa) of eastern Peru extended far into the Andean foothills, where relations with hispanic colonists were frequently hostile. While much has been written about this tumultuous relationship, less is known about Ashaninka interaction with indigenous highland groups just above them. A widespread ceramic tradition reported in several eastern valleys provides evidence for prehistoric Ashaninka occupation close to contemporary highland outposts. Systematic survey in one valley in particular, the Chanchamayo, gives some indication of Ashaninka settlement patterns at the upper limits of their range, especially in relation to better known highland colonization from above.

Hastorf, Christine (Minnesota)

[105] THE INKA'S IMPACT ON AGRICULTURE AND CROP MOVEMENT IN THE CALCHAQUI VALLEY

When the Inka arrived in the Calchaqui Valley of Northwestern Argentina they discovered an arid yet populated region of reasonable production and regular population, in addition to the mining resources. From excavations completed in 1990, systematic botanical remains were collected to investigate agricultural production and trade. These data show not only what was produced locally in the region, but also the political impact of the Inka on the production as well as the rights and differences allowed to the elite rulers who came from far to the north.

Hatch, James (Penn State)

[40] CHANGING PATTERNS IN THE MINING AND TRADE OF "PENNSYLVANIA JASPER"

The results of recent studies conducted at Penn State University regarding the prehistoric use and long-distance trade of "Pennsylvania Jasper" will be presented. The chemical composition of source material from the well-known outcrops of Berks and Lehigh counties, Pennsylvania, as well as other outcrops in the Mid-Atlantic region, will be compared with jasper artifacts from sites throughout New England, the Mid-Atlantic and the upper Southeast. These data, along with information on the phase-specific occurrence of jasper in site assemblages both near and far from the quarry sources, indicate shifting patterns of jasper mining and trading activities through time.

Hatch, Sharon (Northern Arizona)

[35] A WOOD SOURCING STUDY AT THE CHIMNEY ROCK ARCHAEOLOGICAL AREA, SOUTHWEST COLORADO

Trace element data are analyzed in prehistoric wood collected from greathouses at Salmon Ruin and Aztec National Monument in northwestern New Mexico, and modern wood samples collected from the Chimney Rock Archaeological Area. Comparison of the geochemical signatures between the prehistoric and contemporary samples has revealed positive evidence that Chimney Rock, located in the San Juan Mountains of southwestern Colorado, is a potential location for Chaco populations to harvest ponderosa pine and Douglas fir for roof construction in Bonito style pueblos. These data significantly contribute to understanding the socio-economic role of the Chimney Rock settlement.

Hather, Jonathan (London)

[70] PLANT REMAINS FROM POLYNESIA: AN INTERPRETATION OF PAST DIET AND ENVIRONMENT

The components of an extremely well preserved charred archaeological plant assemblage from Mangaia, Southern Cook Islands, Central Polynesia, are briefly outlined. Their interpretation, in

terms of past diet and environment is discussed both with a view to Polynesian prehistory in particular and the potential for archaeobotanical research in the tropics in general. The importance of tracing the origins and spread of tropical food plant cultivars, through the identification of their archaeological remains is emphasized.

Hayashida, Frances (Michigan)

[62] NORTHERN LAMBAYEQUE UNDER INKA RULE

The nature of Inka rule on the north coast of Peru is poorly understood. Using data from recent fieldwork in northern Lambayeque, this paper discusses strategies of Inka incorporation and local response from the perspective of the political economy. Information on Inka control of production and the organization of local and state centers in the region is presented. The results are compared with observations from ethnohistory on Inka and north coastal organization.

Hayden, Brian (Simon Fraser)

[21] PATHWAYS TO POWER: PRINCIPLES FOR CREATING SOCIOECONOMIC INEQUALITIES

The initial emergence of socioeconomic inequality and hierarchies can best be viewed as emerging under conditions of normal relative resource abundance and involving the consent of community members. Possible pathways for converting surpluses into power and wealth inequalities include: simple increased production; use of surplus for exchanging exotica; use of surplus for individual loans; competitive feasting; and profiting from individuals' misfortunes. Some of these pathways are logically far more effective than others; contractual agreements are fundamental to many. Depending on resource characteristics, power and wealth hierarchies can be structured either via the creation of corporate groups or via the organization of independent households. Some labor is organized to produce prestige as well as practical technologies in most pathways as part of the strategy to generate inequalities.

Haydon, R. (see Lozada, M.) [9]

Hays, Christopher (SUNY-Binghamton)

[52] ADENA SETTLEMENT AND MORTUARY RITUAL IN THE UPPER SCIOTO VALLEY

In this study ten Adena sites were examined from a circumscribed environmental region: the Upper Scioto valley near Columbus Ohio. They span the temporal range of Adena and include most of the site types, i.e., small mounds, large accretional mounds, and open sites. Regional variability is examined through a controlled comparison of artifact and feature content and context. Results indicate that while there are some common regional patterns in these variables, there are also pronounced differences. This suggests a highly localized interpretation of the common elements of the Adena mortuary program.

Hays, Maureen (Tennessee)

[14] A FUNCTIONAL ANALYSIS OF THE LITHIC MATERIAL FROM BURRONE SCIERRA I (CALABRIA, ITALY)

A Mousterian assemblage from Burrone Scierra I, (Calabria, Italy) was analyzed using methods from low-power microwear analysis to investigate the relationship between function and edge angle, tool size, raw material, technology and typology. Spatial using point integrity remaining at sites in plow zone contexts provenience data and functional information was also explored. Results revealed a strong relationship between function and edge angle and tool size, while there was little to no relationship between function and technology and typology. Two distinct activity areas were identified revealing that spatial integrity was maintained even within plow zone context.

Head, Genevieve (National Park Service)

[1] A SURFEIT OF STONE? LITHIC RESOURCES AND SOCIAL DEVELOPMENT IN BANDELIER NATIONAL MONUMENT

Competition over resources in the face of population growth is a key aspect of the aggregation model used in the Bandelier Project. Unlike food resources, lithic sources on the Pajarito Plateau are abundant, but geographically discontinuous, and may have become the focus of intense competition as human population increased. The Bandelier Survey lithic database is examined to determine if changes in the distribution of lithic raw materials through time can be linked to changes in settlement patterns in order to assess the extent to which competition for lithic resources played a role in social development within the region.

Headrick, Annabeth (Texas-Austin)

[57] ICONOGRAPHIC EXPRESSION IN THE AGRARIAN CONTEXT OF K'AXOB, BELIZE

Archaeology has increasingly shifted focus from ceremonial centers to smaller sites in the hinterland. Physical distance freed these sites from the direct control of powerful *ahaus*; thus they provide

a window to a previously silent strata of society. Comparison of the iconographic motifs of K'axob ceramics to larger sites indicates that the world view expressed in the art of major cities was shared by the common man. Yet K'axob was not without its own stratification, and functioning as a microcosm of Mesoamerican political organization, the distribution of motifs within the site suggests that particular motifs held emblematic significance for K'axob's elites.

Healy, P. (see White, C.) [37]

Healy, Paul (Trent), Jaime Awe and Gyles Iannone (London)

[37] PACBITUN AND ANCIENT MAYA SLATE USE

Recent investigations at the ancient Maya center of Pacbitun, Cayo, Belize, indicate a lengthy history (ca. 900 B.C.-A.D. 900). Located at the juncture of two sharply contrasting ecoregions (tropical rainforest and pine ridge), the inhabitants of Pacbitun exploited a wide range of natural resources. One raw material which was extracted and worked at the center was slate. This paper examines the range of slate items recovered at Pacbitun, possible geological sources, compares Pacbitun materials with artifacts found at Belize Valley sites, and describes a slate workshop/storage facility at the site.

Heckenberger, Michael (Pittsburgh)

[60] AMAZONIAN ETHNOARCHAEOLOGY: ARCHAEOLOGY, HISTORY AND THE ETHNOGRAPHIC PRESENT

Retrodiction through ethnographic analogy has always been a mainstay of archaeological interpretation in Amazonia. The linkage between ethnographically known societies and prehistoric societies is not unexpected since, unlike many world areas, many largely unacculturated indigenous groups still exist in the Amazon. Ethnoarchaeology, which explicitly seeks to bridge the gap between the present and past, is therefore especially valuable for understanding diachronic sequences of sociocultural change and more general human behavioral and archaeological formation processes in the region. Past contributions and current research are reviewed and future prospects of ethnoarchaeology as an essential component of method and theory in Amazonian archaeology are discussed.

Hegmon, Michelle (New Mexico) and Stephen Plog (Virginia)

[41] REGIONAL SOCIAL INTERACTION IN THE AMERICAN SOUTHWEST: PREHISTORIC EVIDENCE AND ISSUES

The prehistory of the American southwest is a record of many kinds of interaction, including the spread of information, the exchange of material, and the movement of people. This paper examines issues regarding the nature of and evidence for that interaction on a regional scale. These are: (1) the interpretation of regional systems; (2) the role of elites and/or power relations in social interactions; (3) interaction through production and exchange; and (4) style and exchange as different forms of interaction. Conclusions emphasize the importance of considering multiple lines of evidence and various types of interaction.

Heidke, J. (see Wallace, H.) [83]

Helmer, James, Genevieve LeMoine and Donald Hanna (Calgary)

[19] FROZEN IN SPACE: ARCHAEOLOGICAL RESEARCH IN THE HIGH ARCTIC, 1992

This paper will describe a field strategy of intensive surface mapping, combined with collection, recording and replacement of artifacts, developed by members of the Central High Arctic Archaeological Project and designed to satisfy local interests as well as our own research goals. These goals included examination of seasonal/functional variation within and between features at the site and sites in the region, and spatial analyses of both artifacts and features, with the aim of reconstructing Paleo-Eskimo settlement mobility strategies. Preliminary results, and the positive and negative aspects of such a research strategy in the High Arctic will be discussed.

Helms, Candi (Navajo Nation Historic Preservation Dept.)

[103] THE IMPACT OF FEDERAL INDIAN POLICIES ON THE NAVAJO NATION'S CONSTRUCTED ENVIRONMENT

Architectural transformations on the Navajo Nation resulting from Anglo-American occupation and federal Indian policies and programs are explored. The focus is on how federally funded construction between 1868 and the present reflects various federal Indian policies that form today's haphazard constructed asymmetry. This federal intervention produced a non congruent menage of historic buildings, faulty newer construction, and trailer houses on the reservation that are mixed with traditional dwellings. This intervention, although intended to benefit the Navajo, illustrates insensitive federal planning and represents the antithesis of Navajo traditions and culture which is based on beauty, peace, harmony, and order.

Henderson, H. (see McCormack, V.) [57]

Hendon, Julia and Rosemary Joyce (Harvard)

[53] QUESTIONING "COMPLEXITY" AND "PERIPHERY": ARCHAEOLOGY IN YORO, HONDURAS

Research since 1988 in Yoro, Honduras allows us to define a ceramic sequence from late Middle Formative to Terminal Classic, characterize settlement patterns, and identify domestic and ritual practices within settlements. Our results challenge the definition of this area as a less complex periphery reacting to stimuli from neighboring Maya societies. We suggest a redefinition of "complexity" to include less centralized but regionally more heterogeneous society, and the replacement of core-periphery models that address whole regions with more diverse models of sociopolitical networks.

Hester, Thomas (Texas-Austin)

[11] OBSIDIAN IN TEXAS: GEOLOGIC SOURCES AND ARCHAEOLOGICAL INTERPRETATION

For two decades, trace element analysis has been conducted of obsidian artifacts from archaeological sites in Texas. No geologic outcrops of artifact-quality obsidian occur within the state, XRF and NAA analyses of Texas specimens indicate that they are derived from sources in Mexico, New Mexico, Wyoming and Idaho. Artifacts range in age from Paleoindian to Late Prehistoric. While Paleoindian and Archaic obsidian comes from varied sources (as far away as central Mexico), distinct patterns of obsidian distribution are seen in Late Prehistoric times. Particularly significant is the presence of Malad (Idaho) obsidian linked to Great Plains trade networks.

Hiebert, Fredrik (Harvard) and Katherine Moore (Bentley)

[64] EARLY NON-URBAN STATES OF CENTRAL ASIA

Agricultural oases appear in the deserts of Central Asia at the end of the third millennium BC. The Margiana oasis, one of the earliest occupied, was colonized from urban states 200 km to the south-west in the foothills of the Kopet Dag mountains of Turkmenistan. Craft production, exchange, ideological symbols and political organization appear to be similar between the two areas, but oasis settlements are dispersed over the broad deltaic alluvium. The earliest oasis settlements are typically large, well organized, fortified buildings with distinctive internal organization of courtyards, domestic areas, and production areas.

Higgins, Michael (Illinois)

[106] THE NOCHTA SITE AND THE EARLY TO MIDDLE ARCHAIC TRANSITION IN THE NORTHERN AMERICAN BOTTOM

Investigations at the Nochta site have revealed extensive deposits of Early and Middle Archaic materials, heretofore little known in the northern American Bottom. Differences in occupational intensity between the two components are indicated by greater density and diversity of features for the Middle Archaic. It is believed that the pattern observed at the Nochta site is reflective of a fundamental shift in settlement systems from the Early to Middle Archaic toward increasing sedentism. The maturation of the floodplain, with concomitant localization of food resources in slack-water environments is seen as a major influence affecting change.

Hill, Christopher (Minnesota)

[14] GEOLOGIC CONTEXT OF ACEHULIAN ARTIFACTS IN SAHARAN EGYPT

Sediments in the Bir Tarfawi area of Egypt provide evidence about the integrity of Acheulian assemblages and Middle Pleistocene paleoresource potential. In north Bir Tarfawi Late Acheulian artifacts are associated with paleolake deposits. South of the present-day bir, Acheulian artifacts are embedded in siliciclastics and limestones. At Bir Sahara East, Acheulian bifaces and debitage have been recovered from sands associated with a ground-water fed pool. A geoarchaeological perspective provides a basis for models of Acheulian.

Hill, James [Discussant 1]

Hill, Matthew (Kansas)

[113] PALEOINDIAN BONEBEDS IN WESTERN KANSAS: TAPHONOMIC STUDY OF THE FAUNAL REMAINS FROM THREE SITES (NORTON BONEBED, 12 MILE CREEK, AND BURNWOOD CREEK)

Archaeological interest of the late Pleistocene/early Holocene human occupation of western Kansas has been limited to the investigation of the 12 Mile Creek site (14LO1). This paucity of reported Paleoindian sites contrasts to the numerous reported sites from the surrounding states. Recent excavations and analysis of museum collections suggests this lack of material is the result of limited professional involvement in the area, rather than a lack of sites. This paper summarizes the faunal

assemblages and site formation processes of three Paleoindian sites in western Kansas. New information contributes to knowledge of Paleoindian bonebeds in the Central Plains.

Hill, Rick (Smithsonian Institution) [Discussant 86]

Hill, T. (see Nicks, T.) [86]

Hitchcock, Robert (Nebraska-Lincoln)

[7] THE ETHNOARCHAEOLOGY OF SPACE USE AND SITE STRUCTURE AMONG SOUTHERN AFRICAN AGROPASTORALISTS

Space use and site structure among southern African agropastoralists tends to vary, depending on a number of factors including group size and composition, types of activities undertaken, degree of mobility, types of technology employed, and the importance of storage. Ethnoarchaeological observations of Himba, Kua, Tyua, and Ju/'hoansi populations reveal that simple correlations between group size and site size or between houses and livestock facilities and types of adaptive strategies are in need of refinement.

Hitchcock, Robert (Nebraska) [Discussant 56]

Hoard, Robert (MU Research Reactor/Highway and Transportation)

[47] A COMPARISON OF STRENGTH BETWEEN LIMESTONE-, GRANITE-, AND GROG-TEMPERED PREHISTORIC POTTERY REPLICATES

Limestone temper is common in Late Woodland pottery from east and central Missouri and Emergent Mississippian pottery from the American Bottom of western Illinois. Limestone temper makes sticky clay more workable, but also causes pots to spall if fired over 600° C, a low pottery firing temperature. A strength test of ceramic bars that replicate prehistoric pottery tempered with crushed granite, grog, or limestone demonstrates that of the three temper types, limestone-tempered pottery is significantly stronger when fired at 600° C. This suggests the inclusion of limestone was a technological shift, one that required refinement of pottery manufacture techniques to prevent spalling.

Hockett, Bryan (Nevada)

[45] MORE ON RECOGNIZING RAPTOR DAMAGED LEPORID BONES

In 1991, I analyzed nearly 2,500 leporid bones that were deposited on the landscape in raptor pellets, and found that raptors may create cattontail tibia diaphysis cylinders, bones with beak and talon punctures on only one side of bones, shearing damage principally to innomates and femora, and high frequencies of forelimb and juvenile bones. In this paper, I analyze leporid bones from raptor pellets recently deposited in a rockshelter in northeastern Nevada, and from active raptor nests located in the northern Great Basin. These data are presented to assist in recognizing raptor damaged leporid bones recovered from archaeological sites.

Hocquenghem, Anne Marie

[62] UN CAMINO INCA ENTRE TUMBES Y MOROPE: EL POSIBLE ITINERARIO DE PIZARRO EN EL EXTREMO NORTE DEL PERU

Basándose en las relaciones de los cronistas de la conquista, en las ordenanzas de Tambos de Vaca de Castro, en la observación de restos arqueológicos a lo largo de los actuales caminos de herredura se tratará: 1) de reconstruir el posible itinerario seguido por Pizarro entre Tumbes y Morope, 2) de indicar la complejidad del sistema de comunicación del extremo norte del Perú, 3) de vislumbrar el desarrollo de este sistema de comunicación desde el formativo hasta la conquista española.

Hoffecker, J. (see Moeller, K.) [35]

Hoffecker, John (Argonne National Laboratory), Roger Powers, Ted Goebel (Alaska-Fairbanks), and Nancy Bigelow

[19] THE NENANA COMPLEX AND THE PEOPLING OF THE NEW WORLD

The discovery of a Paleoindian complex (f/Nenana Complex/) in central Alaska dating to 11,500-11,000 years B.P., combined with the redating of the Bering landbridge and other recent developments, suggest that the settlement of Beringia was closely linked to the appearance of Paleoindian industries in other parts of the New World roughly 11,000 years ago. Beringia was probably colonized in response to environmental changes that accompanied the 12,000-11,000 B.P. interstadial. These environmental changes (not changing sea levels or continental ice sheets) controlled access to the western hemisphere.

Hoffman, Rob and Jan Simek (Tennessee)

[45] PRESERVATION AND MODIFICATION OF LEPORID BONES BY THE NORTH AMERICAN BOBCAT (*LYNX RUFUS*)

A controlled sample of domestic rabbits were experimentally fed to captive bobcats. Bone specimens were recovered from scats and uneaten components. The recovered bone samples were examined by

scanning electron microscopy and subjected to a variety of analytical procedures. These investigations suggest several taphonomic implications for the effects of bobcats on fossil bone assemblages.

Hoffman, Teresa (Arizona SHPO)

[100] STEWARDS OF THE PAST—VOLUNTEERS PRESERVING OUR HERITAGE

The Arizona Site Steward Program, an organization of volunteers, developed as a cooperative response to curb site destruction, gather information, and provide positive opportunities for public involvement. The program is a multi-agency effort, and most Stewards are citizens who appreciate and respect our cultural heritage. In addition to site monitoring, Stewards are branching out into oral history, historic documentation, stabilization and site protection. By mid-1992, at least 425 Stewards have been trained, over 30,000 hours of service have been logged, and at least 200 sites are being monitored. The Steward Program is having a significant impact on site protection in Arizona.

Hoffman, Jack

[113] PALEOINDIAN AGGREGATIONS ON THE GREAT PLAINS: WHY, HOW, WHEN, AND WHERE?

Flexibility in hunter-gatherer group composition and periodic aggregation is common. Ethnographic cases and standard archaeological interpretations provide only limited examples of how the social and economic purposes of aggregations might be fulfilled. Archaeological evidence for the occurrence, location, and nature of aggregations remains ambiguous, with diverse interpretations offered for aggregation sites during Folsom times. These are reconsidered in light of a model incorporating temporally extended and spatially dispersed aggregations as part of a large scale and longterm landuse pattern. The model implications suggest needed revisions to some Paleoindian site investigations.

Holland, Thomas

[22] BIOARCHAEOLOGY OF SOUTHEAST MISSOURI

Southeast Missouri arguably is one of the archaeologically richest areas of the United States, especially in terms of late prehistoric remains. It is therefore all the more ironic that the state of bioarchaeology for the region is one of woeful ignorance. However, recent analysis of human skeletal remains excavated from the "Bootheel" region of Missouri over the last four decades has allowed the construction of a baseline on which future bioarchaeological work can be evaluated. In the process, insight into topics such as diet, disease, division of labor, migration, and warfare-avenues often shielded from material remains-has started to become possible.

Holley, George, Joyce Williams (SIUE) and Donald Booth (Brandeis)

[106] AN UPLAND VALLEY PERSPECTIVE: PRELIMINARY RESULTS FROM THE SCOTT JOINT-USE ARCHAEOLOGICAL MITIGATION PROJECT

The Scott Joint-Use Archaeological Mitigation Project, located within the central portion of Silver Creek (St. Clair County) and sponsored by the Illinois Department of Transportation, represents the largest program initiated in the upland valleys east of the American Bottom. On-going investigations have identified 100 sites and isolated finds within a 3,800 acre area. Occupation spans the Paleoindian through the Mississippian periods. Although the cultural sequence parallels to a significant extent that identified within the American Bottom, divergences serve to reinforce interpretations linked to adaptations (Late Archaic and Early Woodland) and social forces (Mississippian) within this sequence.

Hollinger, R. Eric (Missouri)

[82] APPLICATION OF PALEOETHNOBOTANICAL DATA TO THE ISSUE OF LATE PREHISTORIC DEPOPULATION OF THE LACROSSE AREA OF WISCONSIN

New paleoethnobotanical information from excavations at the Tremaine Oneota site complex provides important insights into Late Prehistoric (A.D. 1550-1650) depopulation of the LaCrosse area. Hypotheses that translocation of LaCrosse populations to southeast Minnesota and northeast Iowa during this period resulted from partial or complete failure of crops due to climatic change are not supported by floral data. Recent analysis of plant remains from the Filler site (47-LC-149), the latest dated prehistoric site in the LaCrosse locality, suggests failure of Oneota crops did not occur and alternative hypotheses, such as emphasizing bison hunting or impact of epidemics, should be tested more thoroughly.

Holmes, Charles (Office of History & Archaeology, Department of Natural Resources, Anchorage, Alaska) David Yesner and Kristine Crossen (University of Alaska)

[19] LIFESTYLES OF THE FIRST AMERICANS: NEW EVIDENCE FROM THE BROKEN MAMMOTH SITE, EAST-CENTRAL ALASKA

Three seasons of excavation at the Broken Mammoth site near Delta Junction, east-central Alaska, have provided the most detailed evidence currently available for the lifestyles of early (ca. 12,000 yr BP) Beringian populations. Excellent preservation of bone in a matrix of calcareous loess has provided

information on a subsistence regime including large game (principally bison, elk, and caribou), small game, birds (principally waterfowl), and fish. Organic artifacts recovered from the site include bone points, eyed needles, bone toggles, and worked mammoth tusk fragments. Data recovered from the site help to reconstruct the environment of the late Pleistocene "Birch Period" in interior Alaska and to interpret hunting and settlement patterns of early Alaskan populations.

Holmlund, J. (see Craig, D.J.) [83]

Holt, Brigitte (Missouri-Columbia)

[9] PHYTOLITHS FROM DENTAL CALCULUS: DIRECT EVIDENCE OF PREHISTORIC DIET

Phytoliths embedded in dental enamel and calculus provide direct evidence of diet in human prehistoric populations. Such data permit a test of a critical question: how important were cultivated plants in the growth of complex New World civilizations? I examined teeth from several prehistoric populations whose reliance on maize and other cultigens is known or suspected: Paloma (Chilca Valley), Cardal (Lurín Valley), and Chiribaya (lower Ilo Valley). The economic values of the plant species identified are interpreted by considering variation among individuals, gender, age at death, status, and population.

Homburg, Jeffrey, Richard Ciolek-Torrello and Steven Shelley (Statistical Research)

[107] DRY FARMING IN THE SONORAN UPLANDS: A METHODOLOGICAL STUDY

Southwestern archaeologists are becoming increasingly aware of the importance of rock piles as agricultural water-harvesting features in the Sonoran Desert. This paper outlines a methodological approach for reconstructing how rock piles and associated field houses functioned at a Classic period dry-farming site in central Arizona. To minimize ambiguities that are commonly inherent in studies of rock piles, a variety of independent but complimentary data sets were collected during the Lower Verde Archaeological Project. Our approach involves integrating flotation, pollen, phytolith, soil, and artifact analyses with biogeographical and ethnoarchaeological studies.

Hoopes, J. (see Doonan, W.) [93]

Hoopes, John (Kansas)

[104] SOCIAL CONTEXTS FOR EARLY POTTERY IN THE CENTRAL AMERICAN Isthmus

The Central American isthmus has long been recognized as an important bridge between culture areas to the north and south. However, the significant range of variation in form and decoration expressed in the earliest known ceramic complexes from Nicaragua, Costa Rica, and Panama suggests that the appearance of pottery is not readily explained by the diffusion of subsistence strategies or the expansion of horticultural populations. Regional manifestations instead suggest divergent trajectories of culture change. Social interaction is suggested as the principal factor in the emergence of early ceramic traditions.

Housley, R. (see de Selveira, M.) [104]

Houston, S. (see Beekman, C.) [53]

Houston, Stephen and David Stuart (Vanderbilt)

[53] MULTIPLE VOICES IN MAYA WRITING: EVIDENCE FOR FIRST- AND SECOND-PERSON REFERENCES

As exalted accounts of the Maya elite, glyptic inscriptions are thought by many to record only the most impersonal, third-person statements. Recent decipherments document a far broader range of "voices," ranging from direct quotations in the first person to directed remarks in the second. This paper reports on the evidence for such unusual pronominal usage and demonstrates the existence of narratives with shifting speakers and multiple points of view. Unique in PreColumbian writing, this flexibility underscores the extraordinary ability of Maya script to record linguistic nuance.

Howe, Kate (West Florida), Terry Stocker (Hawaii) and George Dodge Sr.

[66] A RECONSIDERATION OF THE TRILOBAL ELEMENT IN MESOAMERICA: DATA SURVEY, CONTINUING INTERPRETATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

New information is presented on the iconographic sign previously labeled the trilobal element. It is proposed that one manifestation signifies rain and/or water. Another manifestation represents blood. Since it can represent either water, rain or blood, separate labels are suggested. It is demonstrated that the three signs existed from the Formative period to Colonial times and may continue to survive among certain present day Maya groups. The significance of this continuity appears to be the importance and interconnectedness of water/rain and blood to the animistic pre-Hispanic peoples.

Hoyt, E. (see Sievert, A.) [37]

Huber, Edgar (Washington)

[26] THE ARCHITECTURAL EXPRESSION OF PREHISTORIC PUEBLOAN SOCIAL COMPLEXITY IN THE UPLAND SOUTHWEST

Architectural and social complexity are closely linked. As compared with nonelite households, elite residential architecture tends to demonstrate greater labor investment, especially in aspects symbolizing status and social meaning. 13th century Mesa Verde Pueblo architectural complexes in southwestern Colorado were compared to determine if there was evidence of elite households. Variation in relative construction effort, masonry selection and uniformity and shaping of stones suggests a moderate level of social or functional differentiation among residential units, but the presence of a residential elite is not supported.

Huckell, Bruce (Desert Archaeology)

[41] FORAGING FOR THE PAST: THE STATE OF HUNTER-GATHERER STUDIES IN THE SOUTHWESTERN UNITED STATES

Since the middle 1960s, there has been a tremendous increase in knowledge regarding the post-Paleoindian, preceramic prehistory of the Greater Southwest. Use of advances in cultural and ecological theory has led to a better understanding of Archaic adaptations to the region, and legally-mandated contract projects have greatly expanded the regional data base. This paper identifies and reviews major topics and trends in Southwestern Archaic studies over the past three decades, evaluates successes and failures, and suggests potentially fruitful directions for future and continuing studies.

Hudson, J. (see Fisher, J.) [7]

Hudson, Jean (Calif-Los Angeles)

[89] TRACKING BONE FROM HUNTING TO CONSUMPTION AND DEPOSITION: ETHNOARCHAEOLOGICAL DATA FROM A MODERN FORAGING GROUP, THE AKA OF CENTRAL AFRICA

An ethnoarchaeological study among the Aka, a modern foraging group, provides opportunities to follow the impacts of various types of cultural behavior on the zooarchaeological remains deposited at a forager residential camp. Patterning resulting from hunting strategies, meat sharing, meat trade, and scavenging by dogs are discussed in terms of their implications for methods of zooarchaeological quantification. Three key issues are identified: 1) matching methods to behavioral questions; 2) selecting appropriate scales of measurement; and 3) evaluating alternative approaches to the interaction of multiple processes.

Huelsbeck, David (Pacific Lutheran) and Ian Ritchie (Mt. Baker-Snoqualmie National Forest)

[2] THE ESSENTIAL INGREDIENT: VOLUNTEERS AND A UNIVERSITY PARTNERSHIP AS CRUCIAL ELEMENTS IN HISTORIC ARCHAEOLOGICAL RESEARCH IN THE STEVENS PASS HISTORIC DISTRICT, WASHINGTON

The Stevens Pass Historic District encapsulates 100 years of transcontinental railroad history and archaeological features near the crest of the Cascade Mountains in Washington State. By combining a university field school with Passport in Time volunteers, the Forest Service gained professional expertise, increased opportunities for media events and public education, and an enhanced experience for volunteers and students. This resulted in the recording, mapping and testing of five sites, as well as unquantifiable products ranging from archival research, interviews and student papers, not to mention exposing the general public to the project and the ethics of Heritage Resource Management.

Hummer, Chris

[40] DEFINING EARLY WOODLAND IN THE DELAWARE VALLEY: THE VIEW FROM THE WILLIAMSON SITE, HUNTERDON COUNTY, NEW JERSEY

The Early Woodland component at the Williamson site was found in a sealed, deeply buried floodplain stratum. Hitherto unknown projectile point types were unearthed, together with Early Woodland ceramics in excellent associative contexts. Activity areas and features, some with charcoal and other botanical remains, were also represented. In addition there was a wide range of both chipped stone and cobble-based tools. These data indicate that Early Woodland culture in the Delaware Valley is more than a simple continuation of the Late Archaic lifestyle, and that it is an entity distinct from previously described neighboring Early Woodland manifestations.

Humphrey, J. (see Ferring, R.) [43]

Hunt, Terry (Hawaii) [Discussant 70]

Hunt, Terry (Hawaii)

[104] EARLY CERAMICS IN THE PACIFIC ISLANDS

Elaborately decorated and associated plainware Lapita ceramics appear to be the earliest in Oceania. The spread of Lapita from western Melanesia to Samoa at about 3,200 BP is associated with colonizing

populations. On present evidence, Lapita pottery 1) arrives in the Pacific as a developed ceramic complex; 2) shares complex stylistic similarities over substantial distances; 3) was produced for trade and local use; 4) diverged into distinctive traditions in time and space; and 5) disappeared in many islands as ceramic production and use was abandoned altogether. Some implications of these patterns are reviewed for Oceania and explanations of ceramic evolution.

Hutinett, Malinda (SUNY-Buffalo)

[97] THE DISTRIBUTION OF TEOTIHUACAN CANDELEROS

This paper is a preliminary analysis of the intrasite distribution of candeleros in Teotihuacan, Mexico from the Tlamimilolpa through the Metepec phases (ca. A.D. 300-750). These enigmatic objects, often identified as personal incense burners, are abundant within the city and occasionally outside the Basin proper prior to the collapse of Teotihuacan. Kolb (1988) reported on the physical characteristics and distributions of candeleros, in particular at Santa Maria Maquixco el Bajo. This paper extends the work of Kolb, discussing the relationship between candeleros and other artifacts (especially ceramic figurines) from the known surface collections of the Teotihuacan Mapping Project.

Hutterer, Karl (Washington) [Discussant 71]

Iannone, G. (see Healy, P.) [37]

Iannone, Gyles (London)

[75] "MINOR CENTERS" AND ANCIENT MAYA SETTLEMENT: CURRENT RESEARCH IN THE PERIPHERY OF CAHAL PECH, CAYO, BELIZE

"Minor Centers" have never figured prominently in the study of Ancient Maya settlement. Ongoing investigations in the periphery of Cahal Pech, Belize, are focusing on a number of "minor centers" of varying size and proximity to the site core. The aim of this research is to provide comparative data for assessing the variation in these settlement units and their role in the larger settlement system.

Ikawa-Smith, Fumiko (McGill)

[4] SETTLEMENT STUDIES IN JAPANESE ARCHAEOLOGY: A REVIEW

Even though Japanese scholarship in Jomon studies is generally seen to be characterized by detailed chronological studies based on ceramic typology, a minority of scholars always emphasized the need to study settlement systems. The paper reviews the theoretical orientation of these settlement studies which appear to have been presented as counter-statements to the mainstream concerns in the archaeological community.

Isbell, William (SUNY-Binghamton)

[48] CHULLPA MORTUARY MONUMENTS: PREREQUISITE FOR AYLLU ORGANIZATION?

The ayllu has long been recognized as the basic unit of social organization among prehistoric Andean peoples. The focus of the ayllu was an apical ancestor—a mummy—whose body participated in rituals that periodically reconstructed relative status and entitlements among ayllu and ayllu segments. Since the preserved mummy played a key role in the continuous process of social construction of ayllu organization, the identification of appropriate tombs will allow archaeologists to trace the history of ayllu organization thought PreColumbian times.

Jackson, Douglas (Illinois-Urbana)

[106] A REEVALUATION OF THE ONEONTA TRADITION IN THE AMERICAN BOTTOM

The American Bottom lies on the periphery of the Oneota cultural tradition and Oneota site data from this area is limited. When the FAI-270 American Bottom Summary volume was published in 1984, a single phase (Vulcan) was proposed to encompass all the known Oneota remains. Since then, two Oneota sites have been excavated and additional Oneota artifacts have been identified. Temporal and morphological differences are now apparent among the Oneota site material assemblages. This has led to a revision of the Oneota temporal/cultural framework in the American Bottom.

Jackson, H. Edwin (Southern Mississippi), Douglas Sims and Angele Montana (Mississippi)

[67] LONGTERM TRENDS IN CULTURE AND ADAPTATION ON THE NORTH-CENTRAL GULF COAST: THE DIAMONDHEAD SHELL MIDDEN, HANCOCK COUNTY, MS.

The Diamondhead site (22HA550), in Hancock County, Ms., is a large multi-component shell midden comprised of discontinuous shell heaps of varying size on Bay St. Louis. The results of investigations there have allowed a reconstruction of the changing direction of cultural influences on local coastal populations during the Neo-Indian Era, as responses to developments in the Louisiana Delta to the west and those in the panhandle area of Florida. These cultural historical trends are

examined in light of longterm trends in coastal foraging patterns as documented by analyses of vertebrate and invertebrate faunal remains from the site.

Jackson, P. (see Liffin, J.) [91]

Jacoby, Robert (Berger Associates) and Kathryn Parker (Great Lakes Ecosystems)

[17] FUNCTIONAL ANALYSIS OF EARLY WOODLAND FEATURES AND SITE STRUCTURE IN THE CENTRAL SUSQUEHANNA RIVER VALLEY

The analysis of a variety of different feature types and their distribution and arrangement are conducted at 2 Meadowood Phase sites along the Susquehanna River. Detailed archaeobotanical, faunal, and soil chemistry analysis are utilized to determine the primary focus of activity at each site. The possibility that the production of ceramics, rather than food processing, represented a The implications of these major site activity is explored. findings as they relate to early Woodland settlement and subsistence are considered.

James, Steven (Arizona)

[45] METHODOLOGICAL ISSUES CONCERNING SCREEN SIZE RECOVERY RATES AND THEIR EFFECTS ON ARCHAEOFAUNAL INTERPRETATIONS

Inferences derived from archaeofaunal remains ultimately depend upon the methodology used to collect the samples. An entire spectrum of small and medium-sized animals are often underrepresented or not recovered with the use of $\frac{1}{4}$ " mesh, yet this screen size has become the "industry standard" in American archaeology. Comparisons are presented for archaeofaunal remains recovered using $\frac{1}{4}$ ", $\frac{1}{8}$ ", $\frac{1}{16}$ ", and flotation samples from several Hohokam and Mogollon sites (A.D. 1 to 1450) in Arizona. Results indicate that 1) 90% of fish remains at Hohokam sites may be lost through $\frac{1}{4}$ "; 2) the Lagomorph Index is biased against cottontails when $\frac{1}{4}$ " screens are employed; and 3) 1-liter flotation samples are of limited value in faunal studies.

Jamison, T. (see Leventhal, R.) [75]

Janetski, Joel (Brigham Young)

[58] SHIFTING HUNTER-GATHERER STRATEGIES IN THE EASTERN GREAT BASIN

Models of adaptive replacement for hunter-gatherer groups in the Great Basin proposed by Bettinger and Baumhoff (1982) and Young and Bettinger (1992) suggest that earlier "travelers" were outcompeted by later "processors." The implications of the model include greater residential mobility and use of higher ranked resources by the travellers and less residential mobility and greater use of lower ranked resources by the processors. Preliminary results of archaeological research at hunter-gatherer sites dating to the Late Archaic (A.D. 150) and the Late Prehistoric (A.D. 1400) in eastern Great Basin tend to support these implications.

Jansen, Henrik (Svendborg County Museum)

[77] TRADE, MARKETPLACES AND SETTLEMENT GROWTH IN DENMARK AD 200-AD 1200

Recently excavated Danish sites provide a new and detailed view into trade and settlement growth between AD 200 and 1200. Ribe and Hedeby, dating from the 8th and 9th centuries, are already well known, but market sites such as Lundeborg and Gudme on Funen, and Stentinger on Jutland, represent similar types of settlements back as early as AD 200. Such communities may be interpreted as forerunners of the towns of the Viking Period and the Early Middle Ages.

Janusek, John (Chicago)

[12] SEGMENTATION AND CHANGE IN TIWANAKU RESIDENTIAL PATTERNS

This paper presents the results of domestic research carried out at Tiwanaku, Bolivia, between 1989 and 1992. Excavations in the urban periphery indicate that important diachronic changes, and great contemporaneous social and economic variability marked the development of the settlement throughout the Tiwanaku IV (A.D. 400-850) and V (A.D. 850-1100) periods. Domestic organization at Tiwanaku was predicated on substantial social segmentation, with notable distinctions of status, economic specialization and social identity. Diversity among minimal social groups thrived within a powerful state culture and political economic system.

Jelks, Edward (Illinois State) [Discussant 92]

Jemison, G. Peter (Ganondagan State Historic Site)

[86] WHO OWNS THE PAST?

Although Native Americans have been the object of study for over a century by anthropologists, a new relationship between these communities is emerging. No longer tolerant of the status quo, Native Americans are now enabled by federal and state legislation to receive a full accounting of

human remains, artifacts, and sacred objects held by institutions. The new relationship is perplexing for administrators and scholars alike as Native Americans gain access to the inner sanctum. Fortunately this new partnership has its rewards: what these are and who the rightful owners are represents the topic of my presentation.

Jenkins, Leigh (The Hopi Tribe)

[86] REPATRIATION, WHY IS IT MORALLY NECESSARY . . . A HISTORICAL PERSPECTIVE ON AMERICAN INDIAN COLLECTIONS

This paper focuses on turn of the century collection of Hopi artifacts by anthropologists and missionaries, and museum collection expeditions from the 1930s through 1950s. Key is the vulnerability of tribes during this period. The Hopi situation is examined in terms of environment, internal tribal conflicts, and government "Manifest Destiny" policies to acculturate native people. Conclusions suggest why it is morally right for the Hopis to request repatriation of artifacts, and draw upon current emotions regarding the impact collection had on the viability of Hopi religious and cultural lifeways.

Jeske, Robert [Discussant 96]

Jessop, Gary (Andover Foundation for Archaeological Research)

[18] THE CONTEXTUAL EVIDENCE OF THE WAY OF LIFE IN THE PRE-CLOVIS ZONES

Locational, use wear, and contextual analysis of the artifacts and ecofacts from each of the 20 Pre-Clovis zones revealed that most of them were occupied for brief forays in the fall of the year. Further, activities seem to have been limited and connected with the results of hunting of animals (many extinct). While fires of large logs were made in hearths (open rock-lined) to cook the meat of these animals, the tools suggest major activities in all occupations in the cave were butchering, skin scrapping, and chopping.

Johannessen, Sissel (US Army Corps of Engineers-St. Paul) and Paula Cross (Illinois Historic Preservation Agency)

[42] THE SOCIAL CONTEXT OF FOOD AT CAHOKIA

Many stratified societies mark and perpetuate distinctions in social class with a sumptuary code regulating personal expenditures in food. Is there any evidence of social variations in the food-system at Cahokia? Can we trace any sumptuary distinctions arising as the Cahokian system emerges? Using extensive data on the remains of the total food-system (food remains, both plant and animal; storage facilities, and cooking and serving dishes), we examine variation among households at the various levels of the settlement hierarchy (farmstead, small village, rural node, and mound center). Pre- and post- A.D. 1000 patterns are compared. We use the results to evaluate the notion of emerging social classes in Cahokian society.

Johannessen, Sissel (US Army Corps of Engineers)

[55] THE CHANGING USE OF PLANTS IN HUMAN SUBSISTENCE STRATEGIES

The central Mississippi River Valley saw revolutionary changes in human subsistence strategies over the last millennia of prehistory. This paper summarizes the available paleoethnobotanical data to outline trends in the changing human interaction with plant communities used for food and fuel. The interpretation of these data include a consideration of their implications for patterns of land use, carrying capacity, and the evolution of anthropogenic environments. The relationship of fluctuations in the late Quaternary environment to the evolving patterns of human plant use is considered.

Johnson, Donald (Illinois)

[43] A REEVALUATION OF THE 'O' FACTOR OF SOIL FORMATION IN TERMS OF 'DYNAMIC DENUDATION': A GAIAN APPROACH TO EXPLAINING ARCHAEOLOGICAL STRATIGRAPHY AND SITE EVOLUTION

The 'O' factor in the soil formation model $s = f(c_l, o_r, p, t \dots)$ refers to organisms, which traditionally has meant only plants and their biochemical effects. In reality there are five kingdoms of life, or four others besides plants. The five lifeforms collectively affect soil biochemically and biomechanically, as Darwin and his contemporaries noted but others forgot. Inasmuch as soil is the usual medium in which archaeologists dig, it is imperative to appreciate the general roles of both processes in archaeological stratigraphy and site evolution. 'Dynamic denudation' is a Gaian approach to explaining site evolution that showcases these and other key soil-slope processes.

Johnson, K. (see Allen, M.) [70]

Johnson, Robert, Mary Bernard-Shaw and Rebecca Austin (Navajo Nation Historic Preservation Department)

[103] ETHNOARCHAEOLOGY ON THE DINEH NATION: NEW PROCEDURES AND METHODS FOR CULTURAL RESOURCE INVESTIGATIONS ON TRIBAL LANDS

The core of Dineh philosophy is tradition, one that is frequently threatened by modern development. Even the discipline of archaeology clashes with the traditions of Dineh culture. For example, the notion of time in Dineh philosophy is circular and revolves around origin stories, the clan and spirituality. As such, conventional archaeology is incompatible with the Dineh concept of time, and even concepts of history and prehistory are in conflict. Working together Dineh cultural specialists, ethnographers and archaeologists have implemented procedures to bring a balance between development and Dineh philosophy. These procedures have affected changes in the methods of Dineh archaeology.

Johnson, Rudolph (California State-Long Beach), Elizabeth Ambos and Daniel Larson (California)

[35] EXPERIMENTAL DESIGN FOR EVALUATION OF VARIABLES AT ARCHAEOLOGICAL SITES BY GEOPHYSICAL METHODS

Experimental design is a crucial aspect of scientific inquiry. We formulated a prospective system for evaluation of geophysical variables in an area with buried subsurface, experimentally replicated, features and objects. Baseline surveys with proton precession magnetometer and a ground-penetrating radar system were obtained in a sterile sandy soil prior to emplacement of replicative features. Several geophysical surveys were conducted over replicative features and results were analyzed for significant geophysical patterns using statistical methods. Preliminary data were used to develop a computer model for objective prediction and interpretation of geophysical anomalies found at actual Basketmaker and Pueblo sites in the American Southwest.

Jones, D. (see Green, W.) [90]

Jones, Dennis (Louisiana Geological Survey)

[67] THE IBERVILLE RIVER: A NATURAL INTRACOASTAL WATERWAY ON THE CENTRAL GULF COAST

Known as the Iberville River to European colonialists and as Ascantia among historic Native Americans, this waterway (now Bayou Manchac/Amite River/Lakes Maurepas and Pontchartrain) provided an east-west route in southeastern Louisiana between the Gulf Coast and the Mississippi Valley. First explored by Iberville in 1699, it played an important role in French, Spanish, and British colonial policies. Also, there is increasing evidence from archaeological surveys and excavations that prehistoric material and cultural ties existed between the Mississippi Valley and the central Gulf Coast using this course.

Jones, G. (see Powell, J.) [113]

Jones, J. (see Pohl, M.) [5]

Jones, Karin (Michigan)

[59] RANK AMATEURS: DIFFERENT STRATEGIES IN MARKING THE DEVELOPMENT OF SOCIAL COMPLEXITY

Different trajectories in the expression of social complexity are traced for Hopewell and Bronze Age Scandinavian societies through varying patterns in the manipulation, exhibition and deposition of exotic goods. The significance of their divergent strategies increasing variation and individuality for Hopewell and increasing standardization for Scandinavia are explored in terms of the number and character of status ranks believed to be marked in each. It is suggested that the rise of systematically demarcated statuses may lead to concomitant systematization of their material expression and trappings of office.

Joyce, Arthur (American Museum of Natural History)

[81] THE INTERREGIONAL IMPACT OF STATE FORMATION IN OAXACA

Archaeological research in the Valley of Oaxaca indicates that a state arose there during the Terminal Formative (100 B.C.-A.D. 250) with its capital at Monte Alban. However, archaeologists have debated the interregional impact of state formation at Monte Alban with alternative models stressing factors such as conquest, alliance, and exchange. The most pervasive evidence of Monte Alban's impact is the diffusion of gray ware ceramic styles to other regions. This paper presents the results of a comparative study of gray wares from the Valley of Oaxaca and five hinterland regions to examine the processes by which these pottery styles diffused.

Joyce, R. (see Hendon, J.) [53]

Juell, Kenneth (Utah), Martha Boden and John Bock (New Mexico)

[71] PRELIMINARY INVESTIGATIONS OF SITE STRUCTURE AT A HAMBUKUSHU VILLAGE, OKAVANGO DELTA, NORTHERN BOTSWANA

This paper presents results of research among Bantu-speaking horticulturalists of the Okavango Delta, northern Botswana, who continue traditional "Iron Age" settlement patterns. Patrilocal homesteads vary in their reliance on agriculture and pastoralism, and in types of structures and features that they construct. This study mapped structures and features at several homesteads and collected data on subsistence returns, kinship, and activities by location. This paper explores the relationships between kinship, household spacing, the presence of particular structure types, and varying subsistence practices. The potential of these and other findings for enhancing interpretation of southern African Iron Age sites is discussed.

Junker, Laura (Vanderbilt University)

[71] THE DEVELOPMENT OF CENTRALIZED CRAFT PRODUCTION SYSTEMS IN A.D. 0-1500 PHILIPPINE CHIEFDOMS

Brumfiel and Earle have distinguished two types of full-time specialists in complex societies: "attached specialists", who produce luxury goods at regional centers for the elite political economy, and "independent specialists", who concentrate at regional centers due to production efficiencies associated with "high volume" product demand. Archaeological and ethnohistoric evidence is used to examine the development of these two distinct forms of centralized production in coastal Philippine complex societies from A.D. 0-1500. Analyses of pottery "standardization" and regional distribution patterns document changing production systems in the Tanjay chiefdom of Negros Oriental.

Kaczor, Michael (Soil Conservation Service) [Discussant 109]

Kandare, Richard (US Forest Service-Allegheny Forest) and Susan Stout (USDA Forest Service-Forestry Sciences Laboratory)

[108] BRANCHING OUT: INTERDISCIPLINARY RESEARCH INVOLVING CULTURAL RESOURCE MANAGEMENT, FOREST MANAGEMENT, AND ECOSYSTEMS MANAGEMENT TO UNDERSTAND THE NATURAL AND CULTURAL EFFECTS OF THE HISTORIC LOGGING ERA (CA. 1890-1930) ON THE ALLEGHENY NATIONAL FOREST, PENNSYLVANIA

The effects of the historic railroad era in Northwestern Pennsylvania (ca. 1890-1930) completely changed the forest cover and patterns of forest growth in the Allegheny National Forest Region. Historic and silvicultural data indicate that different cutting practices resulted in differences in forest cover. This paper examines one of the wood products industries in the region, the Wood Chemical Industry, to determine whether there are silvicultural and archaeological correlates to the different historic logging practices, modern forest cover, and the nearness or distance to historic railroad logging lines and wood chemical factories.

Kane, Sharyn and Richard Keeton

[44] IN THEIR OWN WORDS: AFRICAN-AMERICAN LIFE REFLECTED THROUGH ORAL HISTORY

Oral history accounts from elderly African Americans are the focus of *In Those Days*, by Sharyn Kane and Richard Keeton, who also wrote *Beneath These Waters*, an archeological and historical volume for a public audience. Both books, to be published by the National Park Service, center on parts of Georgia and South Carolina affected by the Russell Dam construction. The rural area has been occupied for over 11,000 years, and the authors explore many cultural and ethnic issues. Research and writing techniques and major themes will be discussed.

Kaner, Simon (Cambridge)

[4] JADEITE, SNOW AND RITUAL: JOMON RESIDENTIAL SHIFT PRACTICES ALONG THE SEA OF JAPAN

Identifying sedentism and mobility has become a major goal in Jomon studies. This research, however, has reached an impasse over recent years, a situation which requires that the goal posts be shifted. It is argued that rather than merely searching for archaeological correlates for sedentism and mobility, we need to be interpreting these behaviors as residential shift practices. A comparison of the individual occupational histories of later Jomon settlements along the Japan Sea is interpreted in terms of the constraints on these residential shift practices. These constraints include ritual, extreme environmental conditions and rich resources.

Kang, Bong (Oregon)

[28] AN EXAMINATION OF AN INTERMEDIATE SOCIOEVOLUTIONARY TYPE BETWEEN CHIEFDOMS AND STATES

Service's model proposing four different categories of sociopolitical type has been widely accepted and used. Although his sociopolitical evolutionary model has been criticized, it still serves as a

valuable concept for the study of prehistoric societies. In this paper, the traditional concept, definition, and criteria of chiefdoms and states will be redefined in the light of archaeological examples as well as ethnohistorical documents. Then, the concept and definition of "kingdom" is proposed as an intermediate stage between chiefdom and state level societies.

Kaplan, Flora (New York)

[44] "POLITICAL CORRECTNESS" AND PROBLEMS OF INTERPRETING GENDER IN WEST AFRICAN ART AND ARCHAEOLOGY

Material remains of a people constitute the "hard evidence" of their existence and of their ideas about themselves and the world they envisioned. Interpreting these remains may conflict with present day political agendas, factions, and values both among the people themselves and those who would interpret them to the public. "Political Correctness" today demands a simplicity not inherent either in the past or present. Using an exhibition on African royal women as a case study, this paper asks—"Whose Ideas?" "Whose Values?" the complexity of sensitive and accurate interpretation is made explicit. The primacy of the culture bearers' views is advocated.

Kardulias, P. Nick (Kenyon) and Mark Dann (Ohio)

[64] MEDIEVAL SETTLEMENT PATTERNS IN THE KORINTHIA, GREECE: THE EVIDENCE FROM AGIOS VASILIOS

The study of Byzantine sites in the Aegean is not commensurate with the historical importance of this period. One effort to redress this oversight by Ohio State University researchers has involved theodolite survey, geophysical prospection, and GIS analysis of the fortified site of Agios Vasilios, which lies in a strategic location in the Korinthia of eastern Greece. This study is part of a larger research program that intends to examine systematically settlement systems in the region. Investigation of the Agios Vasilios site adds important data on the size and configuration of secondary centers in the Medieval Korinthia.

Kealhofer, Lisa (Smithsonian Tropical Research Institute)

[39] HOLOCENE ENVIRONMENTS AND EARLY AGRICULTURE IN CENTRAL THAILAND

In order to lay the foundation for studying the origins of rice agriculture in Thailand, a regional paleoenvironmental study was recently initiated in central Thailand. The project sampled from modern, geological, and archaeological soil sequences for both phytolith and pollen analysis. A series of four Holocene sequences have been analyzed and dated, providing a history of Holocene human impact on vegetation in this area. The identification of rice phytoliths, and a broad range of eco-specific phytolith forms, suggest that a larger scale project could potentially address many issues in discussions of agricultural origins in Southeast Asia.

Kealhofer, Lisa (Smithsonian Tropical Research Inst)

[61] PHYTOLITHS IN SOUTHEAST ASIAN FLORA

As part of an investigation of the development of agriculture in Thailand, 360 species from over 80 families of southeast Asian plants or domesticates were analyzed for phytoliths. The distribution of phytoliths by species, genus, and family is presented. Previously unreported diagnostic phytoliths are also shown. These results provide one facet of the necessary background for paleoenvironmental reconstruction. In conjunction with the analysis of modern and paleo soils, changing patterns of agricultural, and other economic, activities in the region can be studied. Preliminary soil analysis results from central Thailand provide a larger context for compiling a phytolith type collection.

Kearns, Timothy (Division of Conservation Archaeology)

[26] "PIPELINE AND ARCHAEOLOGY ARE STRANGE TEAMMATES": EL PASO NATURAL GAS COMPANY SPONSORED RESEARCH IN NORTHWEST NEW MEXICO

In the early 1950s El Paso Natural Gas Company (EPNG) pioneered "Pipeline Archaeology" in the American Southwest. Portions of this initial project traversed the San Juan Basin of Northwest New Mexico and were subsequently paralleled in 1962 and, recently, in 1992 by additional EPNG pipelines and concomitant archaeological investigations. The impetus, conduct and results of these projects are reviewed and contrasted to reflect the changing character and method of pipeline archaeology in Northwest New Mexico. Emphasis is on the most recent project; from initial planning to excavation. Aspects of project implementation, agency-client-archaeologist interaction, pitfalls and future directions in pipeline archaeology are addressed.

Keegan, William (Florida Museum of Natural History)

[93] ARCHAIC AND SALAOID DIETS IN THE WEST INDIES: TOO LITTLE LAND AND TOO MUCH SEA

The stable isotope analysis of Archaic and Salaooid (ca. 1AD) diets has revealed isotopic signatures that contradict conventional wisdom. On the carbon scale, the Archaic isotope ratios are in the C4

range, which suggests an almost complete reliance on marine foods. The Salaooid population, on the other hand, is so negative (C3 range) that they appear to have obtained all of their food from the land. Evidence from zooarchaeology, palaeobotany, and nutritional studies is combined with isotopic studies of additional groups to develop an economic model to explain these unexpected diets.

Keeton, R. (see Kane, S.) [44]

Kehoe, Alice (Marquette) [Discussant 87]

Kehoe, Alice (Marquette)

[16] MONUMENTALITY

Monumentality marks several of the sites discussed in this symposium; we ask what monumentality implies: a sign of status? or are there other explanations for the creation of monumental structures? Childe listed monumentality in his criteria for cities because it implied capital wealth from taxes or tribute, and (engineering) science. Amos Rapoport says traditional capitals were charismatic "theaters of power," "the center of centers," redundantly the center for authority, transport, trade, arts, and religion. Monumentality communicates the multiply reinforced centrality of the traditional capital. May we infer a site was politically important if it lacks monumental structures?

Kelley, Jane (Calgary)

[41] THE VIEW FROM THE MEXICAN NORTHWEST

Research in Northwestern Mexico has lagged behind that of the American Southwest. As a result, the accumulated information base for Northwestern Mexico is considerably less substantial than that found north of the international border—a factor that affects the nature of problem orientation in contemporary research. The current state of knowledge is briefly assessed and a survey of contemporary research is provided as background to a discussion of the role Northwestern Mexican archaeology might play in methodological and theoretical matters within the larger context of American archaeology.

Kellogg, Douglas (Delaware)

[29] INTERPRETING SITE CLUSTERS: AN EXAMPLE FROM THE MAINE COAST

Prehistoric shell middens along the central Maine coast occur in dense clusters where convoluted shores provide access to a wide range of resources. Productivity limits of adjacent tidal flats are often invoked as the reason for frequent movements by prehistoric groups. Shell midden density is, thus, due to settlement "noise". An alternative interpretation takes the shell midden clusters as the unit of analysis. Discrete shell middens, then, are not individual sites, but segments of dispersed coastal communities focused on the bays and coves around which they occur. Archaeological interpretation of shell midden clusters requires redefinition of the "site" concept.

Kelly, John (Southern Illinois)

[42] STIRLING PHASE SOCIO-POLITICAL ACTIVITY AT THE EAST ST. LOUIS MOUND CENTER AND ITS IMPLICATIONS FOR CAHOOKIA

Recent archaeological investigations at the East St. Louis Mound Center have uncovered an area of mounds and other complex ceremonial buildings and activity. The significance of these discoveries will be examined in light of comparable Stirling Phase activities at Cahokia and the nearby Powell Group. Such activity has implications on understanding and delineating the basis and structure of socio-political power at Cahokia and the surrounding region.

Kelly, Lucretia (Southern Illinois)

[42] THE ROLE OF ANIMALS AT CAHOOKIA

Over 150 animal species contributed to the diet or were used for other purposes by the Mississippian inhabitants at Cahokia. While the economic value of these species was important, many embodied certain symbolic messages that were incorporated into ceremonial and other social uses. Much of this symbolism can be seen primarily in the ethnographic literature of the various Southeastern groups. The purpose of this presentation is to examine the extranutritional value and use of the various animal species at Cahokia and other nearby Mississippian sites.

Kelly, Robert (Louisville)

[41] CURRENT METHOD AND THEORY IN GREAT BASIN ARCHAEOLOGY

The source of the Desert Culture concept, seminal settlement pattern and ecological studies, the Great Basin has long played a critical role in American Archaeology. However, a sea change in archaeology away from ecological approaches and a shift within the Basin to CRM-sponsored fieldwork has diverted attention from important research there. This paper discusses some of the recent theoretical and methodological advances that have been made in the Great Basin. These include the recogni-

tion of variability, mobility, the analysis of surface assemblages, site structure, bioarchaeology, socioecological theory, and relations between archaeologists and Native Americans.

Kent, Susan (Old Dominion) [Discussant 7]

Kenyon, Djenje (SUNY-Binghamton)

[89] WHALERS INFORMING ARCHAEOLOGY: NOTES FROM 100 YEARS AGO

Analysis of faunal materials provides economic, social and taphonomic information to archaeologists. For protohistoric or historic periods, analyses can make use of a variety of information sources including written sources. By utilizing ship's log entries from 16 whalers wintering in and around Demarcation Bay, Alaska between 1893 and 1908, and comparing these data to the faunal materials recovered from the Lorenz Overlook Site at Demarcation Bay, clues are obtained about the site's usage patterns. Particularly important are the non-caribou remains from this Eskimo caribou hunting camp.

Kepecs, Susan (Wisconsin) Sylviane Boucher and Agustin Castillo (INAH-Mexico)

[66] CHICHEN ITZA: A WORLD SYSTEMS PERSPECTIVE

For too long, Mayanists working in northern Yucatan have retained a focus on the single site. Although a few recent papers have begun to examine this area in regional terms, the world systems perspective has yet to be applied. This is crucial, since Chichen Itza was clearly a core in the post-Teotihuacan Mesoamerican world system. In this paper we address the related issues of core-periphery relations and intra-core interactions as they apply to this site. Various lines of information are combined to achieve the fullest possible picture, including new artifactual evidence as well as a consideration of existing iconographic studies. Settlement systems at the regional, pan-regional, and pan-Mesoamerican levels are also examined.

Keter, Thomas (Six Rivers National Forest)

[108] AN INTERDISCIPLINARY APPROACH TO HISTORICAL ENVIRONMENTAL MODELING

Over the last decade efforts have been made to construct a model of the environment during the prehistoric period within the North Fork of the Eel River basin of northwestern California. Both prehistoric and historic land-use activities have influenced the structure of the region's ecosystem. Interdisciplinary research has resulted in the formulation of an historical environmental model providing a context for the interpretation of prehistoric data as well as providing insights into the area's past and present environment. This type of information can also be useful to other disciplines such as ecology, biology, forestry and land-use planning.

Kidder, Tristam (Tulane)

[67] THE EVOLUTION OF CHIEFDOMS IN THE LOWER MISSISSIPPI VALLEY

Research in the Lower Mississippi Valley demonstrates that between A.D. 400 and 1000 hunter-fisher-foragers developed complex social behaviors involving elaborate mortuary, religious, and economic activities. By ca. A.D. 1000 shifts in subsistence and social organization are evident, pointing to a better organized and perhaps even socially stratified culture. These changes led to the development of highly organized chiefdoms after A.D. 1200. Settlement and subsistence data demonstrate the gradual evolution of social complexity and provide a means for examining causal factors leading to the rise of chiefdoms in this part of the Southeast.

Killion, T. (see Baugh, T.) [86]

Killion, Thomas (Smithsonian Institute)

[76] A QUESTION OF SCALE: HOUSEHOLD, COMMUNITY, AND ETHNOARCHAEOLOGICAL RESEARCH IN MESOAMERICA

Recent approaches to the archaeological record of complex societies, particularly in Mesoamerica, have focused on the household. This is an important sociological scale and one implemented in geography, agricultural economy, and settlement archaeology. Ethnoarchaeological research, however, suggests that the application of household-level models cannot stand alone and their usefulness for commonly recovered types of survey and excavation data may be questioned. This paper examines characteristics of the material record at the settlement level of analysis and the implications of this scale for understanding temporal and spatial aspects of the development of communities. Examples are drawn from recent ethnoarchaeological research in lowland and highland Mesoamerica.

Kim, Seung-og (Michigan)

[71] BURIALS, PIGS, AND POLITICAL PRESTIGE

Archaeological constructs guided by ethnographical information are tested against archaeological data from the Shandong province in China. The study demonstrates massive pig consumption and

symbolic pig rituals. It also indicates that the interment of pig skulls was an important way of displaying individual wealth and inequality in the emergence of elites in China. Pigs were the funds of tactical power which were used to control exotic sumptuary items in order to achieve political power in China. Archaeological data strongly suggest that, over the long-term, the fluctuation of pig skulls in burials coincides with that of prestige goods from long-distance trade. In short, the paper shows that the control of pigs must have functioned as both an internal and external source of power to legitimate political authority and respect in ancient China.

Kimball, Larry (Appalachian State)

[40] MICROWEAR ANALYSIS OF LATE AND TRANSITIONAL ARCHAIC PROJECTILE POINTS FROM THE PADULA (36Nm15) SITE, PENNSYLVANIA

A microwear analysis of Late Archaic and Transitional Archaic projectile points from the Padula site indicates the function of these bifacial tools to be primarily projection followed by a limited set of secondary uses. The evidence for the function of these tools in projection, butchery, hideworking, and bone working is discussed. These interpretations are made in the context of experiments specifically designed to evaluate microtraces from use and hafting with replica point morphologies similar to those recovered from archaeological contexts at the Padula site.

King, Eleanor (Pennsylvania)

[5] A REVIEW OF THE EVIDENCE FOR INTENSIVE AGRICULTURE AT COLHA, BELIZE

In 1987 the Colha Project discovered suspiciously rectilinear "islands" at the edge of Cobweb Swamp, next to an area of Late Classic occupation. Excavations in these features, in the adjacent terrain, and in nearby mounds strongly suggested that they represented ancient raised fields, worked by the households closest to them. Since then, extensive work by soil and pollen specialists has considerably enhanced our picture of the ancient Colha environment. While the existence of fields has been affirmed, the different lines of evidence have raised intriguing questions about Maya methods of intensive farming. This paper will attempt to reconcile the sometimes conflicting data and suggest differing interpretations for future testing.

King, Thomas [Discussant 23]

Kingsley, R. (see Robertson, J.) [40]

Kintigh, Keith (Arizona) [Discussant 1]

Kintigh, Keith and Andrew Duff (Arizona)

[35] THE CHANGING FACE OF COMMUNITY: PATTERNS FROM THE ZUNI RIVER DRAINAGE

Several seasons of full-coverage survey along the Zuni River provide the information necessary to examine changing community patterns in a local area. Spatially discrete, dispersed communities are evident ca. A.D. 1050, but are soon abandoned. By A.D. 1175 aggregated settlements appear in areas with scant previous occupation. This suggests localized variability and lack of continuity in settlement stability through time. Abrupt population movement and reorganization indicate the intensity and spatial scale of social relationships between settlements were variable, short-lived and unstable, properties also associated with Pueblo IV nucleated communities.

Kirch, Patrick (California-Berkeley)

[70] HUMAN IMPACTS IN ISOLATED ISLAND ECOSYSTEMS: THE MANGAIA MODEL

A three-year interdisciplinary research project involving archaeology, paleontology, geomorphology, and palynology has produced a detailed environmental and cultural record for the central Polynesian island of Mangaia (Cook Is.), from 7,000 years BP to the present. The impacts of prehistoric Polynesian colonization on a previously isolated insular ecosystem include forest removal and habitat disturbance, erosion and alluvial sedimentation, massive avifaunal extinctions, and impacts on the inshore marine biota. The human-induced changes in the island's physical and biotic environment are also reflected in socio-political transformation occurring in the late prehistoric period, including agricultural intensification and warfare.

Klein, M. (see Hantman, J.) [29]

Klingman, Debora (UBA-Instituto de Ciencias Antropológicas) and Cristina Bellelli (CONICET)

[36] EXAMINING THE UNDERLYING ASSUMPTIONS OF REFITTING STUDIES CARRIED OUT IN ARGENTINA

Refitting studies have proved to be useful for inferring behavioral activities and for assessing site integrity and postdepositional disturbance. These studies have been performed on a variety of materials in differing archaeological settings. The conclusions of a recent debate on refitting carried out in

Argentina are presented and the underlying assumptions for using this approach and evaluating potential results are examined.

Klippe, W. (see Carr, P.J.) [112]

Klippe, Walter and Lynn Snyder (Tennessee)

[64] GREEK DARK AGE SUBSISTENCE IN EAST CRETE: LATE BRONZE AGE AND EARLY IRON AGE HUNTING AND ANIMAL HUSBANDRY AT KAVOUSI

Over 50,000 fragmented animal bones have been recovered from the Vronda and Kastro sites in the Siteia Mountains near Kavousi, Crete. Remains from stratified deposits indicate changes in the exploitation of wild animals as well as changes in how domestic animals were husbanded following the decline of the Minoan Civilization in this portion of the Mediterranean. Modern comparative specimens from the Island have been used to evaluate established methods of identification and age determination for the most common domestic species recovered from Kavousi.

Kneebone, Ronald (US Army Corps of Engineers)

[76] CHAOTIC THERMODYNAMICS AND HOUSEHOLD SPATIAL STRUCTURE

An observation made repeatedly in studies of inter- and intra-settlement spatial organization is that structure or organization becomes increasingly complex as the use of an area increases in "intensity." I explore this phenomenon from the perspective of nonlinear thermodynamics and chaos. Using data from two studies of modern households, measures of spatial organization are developed from thermodynamic principles. Changing household population density, suggested to be measure of intensity, is then seen to produce patterned variation that is typical of nonlinear or "living" thermodynamic systems. The paper closes with a discussion of the perspective's implications for archaeological inquiry.

Knight, Vernon (Alabama) [Discussant 42]

Knight, Vernon (Alabama)

[102] MOUNDVILLE AS A DIAGRAMMATIC CEREMONIAL CENTER

Some ethnographically documented ceremonial centers have spatial layouts that are diagrammatic of basic aspects of social organization. The Moundville site shows regularities in its layout that strongly suggest that its plan is diagrammatic. A convincing model for interpreting these regularities comes from an ethnographic account collected by Frank Speck of spatial relationships among Chickasaw corporate kin groups in a ceremonial context.

Kobayashi, Tatsuo (Kokugakuin)

[4] DUAL ORGANIZATION OF JOMON COMMUNITIES

Dwelling remains in Jomon settlement sites often occur in two clusters. In such settlements, it has also been observed that burials occur in two different forms (extended vs. flexed, or two different modes in body orientation) and that ceramic vessels are manufactured using two different techniques. It is therefore argued that Jomon communities were probably composed of two constituent parts.

Koetje, Todd (Indiana at Pennsylvania)

[112] SPATIAL PATTERNING DURING THE EARLY AND LATER ARCHAIC AT 36ME105

The Goddard Site, (36 ME 105) is a multicomponent site in M.K. Goddard State Park, Mercer County, PA. It contains Early and Late Archaic components, dated to 9,200 and 5,300 B.P., respectively. The Early Archaic component consists of a hearth, and circa 20-30 small post molds forming 2 concentric semi-circles on the northern edge of the hearth areas, making it one of the earliest known structures in western Pennsylvania. The Late Archaic component consists of several unusual hearth and post mold features, including a hearth used for heat treating flint. Analysis of the two-dimensional spatial patterning at the site suggests that the two components can be reliably separated, and broken down into activity zones.

Kohler, T. (see Powers, R.) [1]

Kohler, Timothy (Washington) and Robert Powers (National Park Service)

[1] THE BANDELIER ARCHAEOLOGICAL PROJECT: TOWARDS A REVISED MODEL FOR AGGREGATION, AND ITS IMPLICATION FOR THE STUDY OF NEOLITHIC VILLAGE FORMATION WORLDWIDE

After briefly reviewing the initial model for aggregation and summarizing the data contributed towards its testing by five years of survey and excavation, we present a revised model for village formation in this area that finds significant roles for population size and history of occupation, wild resource depletion, agricultural intensification, mean maize production levels and spatial and temporal variance in production levels, and development of new sharing rules operating under novel

social and religious formations. We review a worldwide literature on aggregation to attempt to assess the boundaries of application for this revised model, and suggest fruitful directions for further research on these questions in the North American Southwest.

Kolata, Alan (Chicago) [Discussant 5]

Kolata, Alan (Chicago)

[16] COMPARING ANDEAN CAPITALS

This paper examines the Andean capitals of Tiwanaku, Chan Chan and Cuzco in comparative perspective. The focus of the cross-cultural/cross-temporal comparison is on fundamental principles of social and political organization, and on the central role of symbolic representation. The paper concludes with a set of proposed structural and functional principles that characterize the essential nature of the Andean city as a capital.

Kolata, Alan (Chicago)

[73] TIWANAKU: ORIGINS, IMPACT, LEGACY

This paper presents a synthetic overview of recent advances in the archaeology of complex societies in the Bolivian altiplano and adjacent areas (eastern and western *yungas* regions). Particular emphasis will be placed on examining the emergence and impact of state societies in the region, with special reference to Tiwanaku. New evidence of regional climate change in the period from A.D. 1000-1400 will be presented in the context of a consideration of broad cultural-historical changes in the southern Andes during this time.

Kolb, Michael (Hawaii State Preserv Division)

[39] THE ROLE OF HUMAN PREDATION AND EXIRPATION OF TERRESTRIAL AVIFAUNA IN THE SCOPE OF HAWAIIAN ISLAND SUBSISTENCE PRACTICES

This paper examines the link between extinct avifauna and human domestic practices within the scope of Hawaiian subsistence practices. The faunal assemblage from an upland religious site is examined and discussed. Results indicate that domestic animals replaced wild birds and fish as staple protein sources in a relatively short time, sometime after A.D. 1440, and that predation played an important role in upland environmental degradation along with human landscape modification and deforestation. Unlike other Polynesian island birds, forest-adapted avifauna in Hawaii became extinct relatively late in the course of human occupation.

Koldehoff, B. (see Lothrop, J.J.) [40]

Koldehoff, Brad (Berger Assoc.)

[17] TRENDS IN LITHIC TECHNOLOGY IN THE CENTRAL SUQUEHANNA VALLEY

Lithic data from a series of recently excavated prehistoric sites in the Susquehanna valley of Pennsylvania are summarized. These data are used to examine trends through time in how the Archaic and Woodland inhabitants of the Central Susquehanna Valley organized their lithic technology. Special attention is given to the impact that changing patterns of land use may have had on the way in which lithic resources were exploited.

Kollman, Dana (Berger Associates)

[17] MEADOWOOD PHASE CERAMICS IN THE CENTRAL SUSQUEHANNA RIVER VALLEY: AN EXAMINATION OF CERAMIC USE AND TECHNOLOGY

Analysis of ceramics at two Early Woodland sites along the Central Susquehanna River valley is presented. Analysis of a nearly complete Vinette I vessel recovered from a pit feature from one of the sites are incorporated in the study. Botanical and faunal remains associated with the pit fill on the interior of the vessel are also analyzed. The role of a still relatively new technology (ceramics) in the overall subsistence strategy during the Meadowood Phase is also explored.

Konigsberg, Lyle and Susan Frankenburg (Tennessee)

[59] MISSING SKULLS AND MISSING DATA IN OHIO HOPEWELL

Craniometric inferences from Ohio Hopewell materials have been severely hampered by small sample sizes and the incompleteness of the skeletal remains. However, statistical methods developed in the last decade for dealing appropriately with incomplete data sets provide an avenue for interpreting the scanty remains. We demonstrate some of these methods using C.E. Snow's Ohio Hopewell craniometric data collected primarily in 1944. One result of our work is the demonstration by a finite mixture analysis that the sex ratio for "trophy" skulls does not differ substantially from 1:1.

Kornfeld, Marcel and Mary Lou Larson (Wyoming)

[34] CHANGE AND CONTINUITY IN EARLY TO MID-HOLOCENE NORTHWESTERN PLAINS TECHNOLOGY

The Paleoindian to Archaic transition on the Northwestern High Plains is frequently portrayed as involving a shift from specialized big game hunting to a broad-based subsistence strategy accompanied

by a change in highly stylized artifacts (projectile points). Yet, research in the Middle Rocky Mountains and Northwestern High Plains suggests the presence of variable Paleoindian and Archaic adaptations made possible in part through a technology that allowed flexibility between curated and expedient strategies. The changes and continuities in post-Pleistocene High Plains technologies shed new light on human adaptive systems in this region.

Kotliar, Jay (UCLA)

[94] TWO FACES OF CHERT: LITHIC PRODUCTION AND INTERREGIONAL VARIATION DURING THE LATE-TERMINAL CLASSIC IN NORTHERN BELIZE

In the Late Classic a number of communities specializing in lithic production emerge in the Chert Bearing Zone of northeastern Belize in compliment or competition to Colha. This paper represents an in process analysis of the effects of the social transformations during the Late-Terminal Classic on lithic production systems. Two communities with a strong emphasis on flint knapping, Colha and Kunahmul, will serve as the case studies. Variability in production between the northern and southern ends of the Chert Bearing Zone will be examined.

Kreisa, Paul (Illinois)

[22] MISSISSIPPIAN CERAMIC CHRONOLOGIES IN WESTERN KENTUCKY: A VIEW FROM SEVERAL LOWER OHIO RIVER SITES

Despite a decade of intensive excavations at Mississippian sites in Western Kentucky, the local chronology continues to be a source of debate. Information from several recently excavated sites along the Ohio River between Wickliffe and Kincaid have yet to be incorporated into this debate. Ceramic and radiocarbon evidence from these sites is detailed, with emphasis on data from Twin Mounds and its 2 meters of Mississippian stratigraphic record that spans almost 400 years of occupation. The Ohio River sites are then compared to several proposed Mississippian sequences, and biases, both archaeological and methodological, are discussed.

Kreutzer, Lee (Washington)

[113] TAPHONOMY OF THE MILL IRON, MONTANA BISON BONE BED

The Mill Iron bison bone bed [24CT30] is a Paleo-Indian (Goshen) site located on an isolated butte in southeastern Montana. Its geological context provides no direct evidence of a trap, but spatial characteristics of the specimens suggest that some sort of natural impoundment may have existed when the animals died. Before its subsequent, slow burial by slopewash, the assemblage was modified by carnivores, rodents, and insects, and at one point was partially eroded by a stream and burned over by a range fire.

Krueger, H. (see Ezzo, J.) [8]

Kuckelman, K. (see Varien, M.) [83]

Kudlik, John (Allegheny County)

[77] FISHING, SEASONAL MARKETS, AND URBAN EVOLUTION IN COASTAL SWEDEN, AD 1100–1500

An especially abundant herring fishery on the Falsterbo Peninsula at the southwest tip of Sweden gave rise to centuries of productive maritime activities. From the 12th through the 16th centuries, settlements evolved from impermanent shore camps of peasant fishing peoples, into a major seasonal market-fair, and ultimately to urbanization of the region. This paper will present results of archaeological and historical research into the evolution of this major commercial region of northern Europe.

Kuijt, Ian (Harvard)

[64] EXCAVATIONS AT 'IRAQ ED-DUBB, JORDAN: IMPLICATIONS FOR SETTLEMENT AND SUBSISTENCE PRACTICES OF THE EARLY NEOLITHIC OF THE LEVANT

The pivotal transition from semi-sedentary hunting/collecting characteristic of the Late Natufian to early Neolithic (PPNA) sedentary agriculture life has generated several models of settlement and subsistence change. While these models invoke causes such as population expansion, technological innovation, and social interaction, the archaeological data upon which they are rooted are limited to excavated large agricultural villages. Recent research at the early Neolithic site of Iraq ed-Dubb, situated in the forested upland areas over-looking the Jordan Valley, provides significant new evidence for the year-round occupation of the forested highlands by early agriculturists as early as 10,000 BP.

Kukla, George (Lamont-Doherty Geological Observatory) [Discussant 78]

Kunz, M. (see Cook, J.) [46]

Kunz, M. (see Reanier, R.) [46]

Kunz, Michael (Bureau of Land Management) and Richard Reanier (Washington)

[46] THE MESA SITE: A PALEOINDIAN SITE IN THE ARCTIC

Recent excavations at the Mesa Site (KIR-102) have revealed the extent of the intensive Paleoindian occupation of this Late Pleistocene/Early Holocene site on the north side of Alaska's Brooks Range. The site lies atop a mesa-like ridge that rises some 60 m above the surrounding terrain. To date the remains of more than 50 lanceolate projectile points have been recovered, some from within shallow hearths. The age of the occupation is now constrained by AMS radiocarbon dating to the interval 9700–11,700 yr. B.P. The site lacks evidence of utilization by other cultures, and thus, unlike most shallow arctic sites, the assemblage is uncontaminated by more recent material.

Kurtz, W. (see La Point, H.) [2]

Kvamme, K. (see Longacre, W.) [39]

Kwiatkowski, Scott (Soils Systems) and Jo Anne Miller

[107] USING ARCHAEOBOTANICAL DATA FOR SITE LEVEL INFERENCE: SOME HOHOKAM EXAMPLES

If the charred plant data from an archaeological site are examined in light of five considerations: 1) archaeological context, 2) site formation processes, 3) ethnographic analogues of plant use and discard, 4) comparative regional archaeological studies, and 5) site level quantitative studies, these data can provide useful economic information about a site. Using recent Hohokam examples, features with unusually abundant charred plant remains are related to feature function, groups of features are differentiated based on charred plant similarities, and site catchment analysis is used to provide resource potential information.

La Point, Halcyon and William Kurtz (Custer National Forest)

[2] INVESTIGATING CUSTER'S 1876 TRAIL ON THE CUSTER NATIONAL FOREST

The trail Lt. Col. George Custer took through the Badlands of North Dakota from Fort Lincoln to his demise at the Battle of the Little Bighorn crosses portions of the Custer National Forest. The exact location of this trail, however, has never been recorded. PIT volunteers located two miles of wagon ruts leading to Custer's Snow Camp, but the most surprising discovery was the location of the 1864 battle between General Sully and Sitting Bull which occurred along the same route.

La Porta, Philip (Hunter)

[40] STRUCTURAL AND STRATIGRAPHIC MODELS APPLIED TO THE GREAT VALLEY SEQUENCE: THE ELUCIDATION OF A PREHISTORIC MINING DISTRICT

Geologic mapping within the Hamburg and contiguous quadrangles of Sussex County, New Jersey has led to the development of a chert stratigraphy for the Cambro-Ordovician carbonates. Field reconnaissance has discovered several diagnostic types of prehistoric quarries and, thus far, two prehistoric mining districts have been circumscribed. Prospect pits, scree, declivities, conical pits, and fully developed quarry faces are representative of a full spectrum of mining practices employing a high degree of mechanical skill. Complementing the variation of mining techniques is a series of diagnostic instruments employed to extract and process the ore (chert).

Lafferty, Robert (Mid-Continental Research Assoc.)

[22] EVOLUTION OF SETTLEMENT STRUCTURE IN THE NEW MADRID FLOODWAY

Archeological survey of 7000 acres in the New Madrid Floodway has resulted in the identification and testing of 250 sites ranging in time from late Archaic through Mississippian and 19th century Euroamerican occupation. Radiocarbon dates and deep extensive middens suggest long stable occupation through much of this period. The settlement structure adapted to the changing meanders of the Mississippi River and earthquake effects.

Lamata, J. (see Borrero, L.) [27]

Lamberg-Karlovsky, Carl (Harvard) [Discussant 110]

Lambert, Patricia (California-Santa Barbara) and Herbert Maschner (Illinois)

[11] VIOLENCE AND WARFARE IN PREHISTORIC HUNTER-GATHERER SOCIETIES OF WESTERN NORTH AMERICA

In this paper we use ethnohistoric and archaeological data from two coastal regions of western North America to assess the causes of violence and warfare among hunter-gatherers. In southern California, skeletal evidence for violent conflict exists from all time periods, but is particularly common in collections that date between AD 300–1250. This is a time when the large, sedentary population was beset by a series of prolonged droughts. On the Northwest Coast, war clubs and cranial injuries also document a long history of less intensive conflict. Escalating levels of violence

are recognizable after about AD 1200 by the appearance of defensive sites on bluffs and promontories. In these regions, it is only at this time that resources appear to play a more central role in the region-wide escalation of warfare. In both areas, we demonstrate that violent conflict has a long history, with periods of escalation due to fluctuations in climatic conditions and resource availability.

Lanata, José (Texas-Austin)

[73] CURRENT PERSPECTIVES IN THE EVOLUTION OF HUMAN ADAPTATIONS IN SOUTHERN SOUTH AMERICA

Between 1930 and 1970, the archaeology of the southern cone of America was overshadowed by the work of Junius Bird. During the last 20 years, the Pampa-Patagonia region has witnessed an important growth in the number of archaeological investigations. As a consequence, there are now multiple competing perspectives on the evolution of human adaptation. This paper presents a summary of these competing views and discusses the distinct notion of evolution employed in this recondite tip of America.

Lange, Frederick (Colorado)

[93] IDENTIFYING SEASONALITY IN COASTAL SUBSISTENCE SYSTEMS ON THE PACIFIC COAST OF PREHISTORIC CENTRAL AMERICA

There has been little emphasis on the seasonal aspects of coastal populations in prehistoric Central America. Coastal systems are components of broader regional systems, in which exchange systems develop and/or seasonal transhumance occurs. The ability to identify seasonality in coastal settlements and the exploitation of coastal resources is critical for models of prehistoric adaptation. Published excavation data on prehistoric Pacific coastal settlement and subsistence systems will be reviewed for the degree of analysis of systemic and seasonal data. Combined with broader comparative data, suggestions will be made on how future studies might successfully address the seasonality issue.

Larick, Roy (Bement)

[38] ETHOLOGICAL INFORMATION IN THE ANIMAL REPRESENTATIONS OF LASCAUX

The hundreds of complex animal representations and scores of multi-animal compositions at Lascaux entice ethological analysis. The Lascaux animals are uncannily complete anatomically but stylized toward incorrectness. Three ethological indicators, ear position, tail position, and footfall are examined at Lascaux and other caves in Perigord and Quercy. Ethological information on individual animals abounds in wall imagery throughout the region, but group behavior is less evident. While often described as galloping or leaping, few Lascaux animals show footfalls for more than canter. Lascaux provides poor evidence for any general model of artistic intentions regarding ethology.

Larson, D. (see Johnson, R.) [35]

Larson, M. (see Kornfeld, M.) [34]

Larson, Mary (Brown)

[11] AND THEN THERE WERE NONE . . . : THE "DISAPPEARANCE" OF THE QARGI IN NORTHERN ALASKA

The qargi (ceremonial house) of Northern Coastal Alaska organized communities both socially and spatially, but its role changed during various stages of economic and religious contact with Euroamericans. Qargi structures were systematically dismantled or had their uses altered in coastal villages between Cape Prince of Wales and Barrow, Alaska, but in many of these communities the institution of the qargi remained an important organizational force long after the permanent structures were gone. Through the use of archaeological, archival, and oral historical data, this paper addresses how changes in the use of the qargi are reflected in the archaeological record.

Larsson, Thomas (Umeå-Sweden)

[59] VISTAD—AN EXAMPLE OF REGIONAL POLITICS AND EXCHANGE SYSTEMS IN NORTHERN EUROPE 900–500 B.C.

Recent excavations at Vistad, in eastern Middle Sweden, have revealed a fortified settlement of a type that is new for Scandinavia. It is a settlement of Middle European type, typical of the Lusatian culture. The houses, pottery and palisade structure found are all typical of the Lusatian area, and the existence of this site, far away from its normal area of distribution, will be discussed in political, economic and social terms. Regional politics and long-distance exchange systems of the chiefdom type will be discussed in order to explain this phenomenon.

Lawlor, Elizabeth (California-Riverside)

[61] THE FORMATION OF PHYTOLITH (PLANT SILICA) DEPOSITS: CULTURAL AND ENVIRONMENTAL PROCESSES IN CALIFORNIA'S EASTERN MOJAVE DESERT

Phytoliths have exciting potential as indicators of prehistoric features if we assume decay-in-place deposition (in contrast to the wider spread of wind-borne pollen). Piperno demonstrated such

deposition in a tropical forest; does it also occur in an open, windy desert? To address this question, artificially decayed soil samples from experimental seed-processing areas are compared to those from control areas. Wind effects are assessed with pollutant collectors. Phytolith content of native plants is discussed, with a focus on shapes in *Oryzopsis hymenoides* (ricegrass) in relation to other Stipeae and to the cultural process of threshing with fire.

LeCount, L. (see Leventhal, R.) [75]

LeMoine, G. (See Helmer, J.) [19]

LeVasseur, Andrea (Superior National Forest), Gordon Peters, and Stephen Mulholland

[99] THE MISIANO SITE: A MULTICOMPONENT OCCUPATION IN NORTHEASTERN MINNESOTA

Misiano contains small components from the Terminal Woodland (300-1000 B.P.), and Archaic (2500-7000 B.P.), and a large Late Paleoindian (7000-11000 B.P.) occupation. Of major interest are possible house structures, several fire hearths, an unusual flake cache, and abundant lithic debris. Situated on a moraine in a riverine environment, the geomorphological character of the site provides stratigraphic separation of cultural deposits, and some bone is preserved, both rare features on the Canadian Shield.

Leader, Jonathan (South Carolina Institute of Archaeology and Anthropology)

[44] THE IMPORTANCE OF BEING EARNEST: CULTURAL COOPERATION IN ARCHAEOLOGY

This paper represents a synthesis of the activities of the South Carolina Institute of Archaeology and Anthropology's Office of the State Archaeologist, as they pertain to the sensitive interaction with diverse cultural/ethnic groups in South Carolina. Specific experiences drawn from the implementation of legislation, public outreach and education programs at all levels, and the active coordination and integration of agency and community resource people is used to identify programs and success associated with sensitive programming.

Lechtnan, Heather (Massachusetts Institute of Technology)

[85] ANDEAN TECHNOLOGY AND ANDEAN CULTURE

This review will emphasize the change in our approach to Andean technologies and how we are using new data. It will range broadly to include production technologies and systems for managing space and time. Subsistence systems will not be treated.

Ledergerber-Crespo, Paulina (Smithsonian)

[20] A PRELIMINARY REPORT ON A COMPARATIVE ARCHAEOLOGICAL SURVEY IN MORONA-SANTIAGO, ECUADOR

Archeological survey and stratigraphic testing in two sectors of the Zamora-Santiago river basin in heavily forested southeastern Ecuador, offer the opportunity to assess the existence of a prehistoric cultural frontier between "ceja de montaña" and lowlands. Sites in the Gualاقua region are on the summits of hills, the most spectacular being an extensive arrangement of stone walled structures and terraces in a location ideal for defense. Sites in the Santiago region consist of shallow accumulations of domestic refuse along riverbanks. Rock shelters containing burials and salt springs surrounded by potsherds were also encountered. Similarities and differences in the associated pottery provide the basis for defining the cultural entities represented and for assessing their interactions.

Lee, Carla (Houston) and Rebecca Storey

[57] OSTEOLOGY AND PALEOPATHOLOGY OF THE K'AXOB SKELETAL SAMPLE

Demographic characteristics and general paleopathological indicators for the lowland Preclassic Maya skeletal sample will be described. The age and sex profile is dominated by adult males but females and children are represented. The population appears to have been quite healthy, judging from the lack of pathological indicators, and its robusticity is striking, especially in comparison to later Mayan populations and other Native Americans. This robusticity is probably the result of both good diet and an active life-style. The implications of the robusticity and demographics for understanding K'axob society will be discussed, and comparisons drawn with other Maya populations.

Lee, Yun (Michigan)

[71] SPATIAL EXPRESSION OF SOCIAL ORGANIZATION: A CASE STUDY OF A YANGSHAO VILLAGE COMMUNITY

Spatial organization of behavior is culturally significant. Human groups often use spatial separation and ordering to operationalize their cultural conceptions. Therefore, the spatial pattern of a habitation site should actualize the organizational principles of the community. The spatial data of a prehistoric Yangshao village site is used to monitor its social organization. Residential area of the site was

divided into five homogeneous spatial sectors. Each sector was evidently occupied by a autonomous social group. It is argued that the community was organized along segmentary principles.

Lee-Thorp, J. (see Raymond, J.) [93]

Leech, Roger (Royal Comm on Hist Engl Monuments)

[32] FROM SURVEY TO RECORD—PROVIDING A NATIONAL DATABASE

The Royal Commission on the Historical Monuments of England, as the national body of survey and record, has made the creation of a national database a priority over the past decade.

There has been a shift from detailed survey towards providing a comprehensive national inventory for England.

The benefits of this policy are now beginning to bear fruit and this paper will explain the current policy, methodology and approaches to the creation and use of England's National Monuments Record.

Lekson, Stephen (Crow Canyon Archaeological Center)

[41] SHAPING THE PUEBLO WORLD: SOUTHWEST AFTER 1150

This paper considers recent research on the post-1150 Southwest from the perspective of large-scale human adaptations. The Southwest underwent profound reconfiguration after A.D. 1150. Elements of earlier regional systems persisted through the 13th century, but relocations in the 13th-14th centuries shattered a centuries-old regional ecology. The Puebloan world of the 15th and early 16th centuries continued this new trajectory, later interrupted by colonial intrusions.

Lennstrom, Heidi (Minnesota)

[50] PRECERAMIC PLANT REMAINS FROM THE FAR SOUTH COAST OF PERU

Research into the prehistoric use of plants from the Ilo area was conducted by the author in 1991 and 1992. The area is currently one of the driest environments on earth, yet a number of resources are available. Resource patches include the marine environment, lomas areas, desert, river valley, and foothills of the Andes. Materials recovered from flotation samples from three Preceramic Period sites are being analyzed. Abundant archaeobotanical remains have been collected which suggest that several resource zones were exploited by early inhabitants of the south-central Andean coast.

Lenville, Stella (Parkland College)

[112] THE SEARCH FOR THE GRAND VILLAGE OF KASKASKIA

The Grand Village of the Kaskaskia was first described in the journals reporting Marquette and Jolliet's 1673 exploration of the Mississippi River. Known to three generations of archaeologists as the Zimmerman Site, it provided an unusual opportunity for examining research questions on the Proto-Historic and Contact Periods of mid-western archaeology. In 1992, the first systematic surface collection of the Zimmerman Site (11-Ls-13) was initiated. The reconnaissance included nearly six thousand, five meter square collection units. The results were different than predicted.

Leonard, Banks (UCLA)

[12] CHIMU AGRICULTURAL PROJECTS IN THE CHICAMA VALLEY, PERU: NEW OBSERVATIONS

Recent fieldwork on reclamation works of the Late Intermediate Period in the Chicama Valley of the Peruvian North Coast has focused on studying the construction and use of agricultural field systems watered by major Chimu irrigation works. Several distinct types of field system designs are described for both the north and south valley margins and evidence bearing on the organization and provisioning of the labor forces involved will be discussed. Study of these well-preserved agricultural features sheds valuable light on aspects of Chimu state agricultural policy and political economy.

Lesko, L. (see Hanson, J.) [2]

Leventhal, Richard (UCLA), Thomas Jamison (SUNY-Albany) and Lisa Le Count (UCLA)

[75] XUNANTUNICH: THE TERMINAL LATE CLASSIC IN THE BELIZE RIVER VALLEY

The Belize River Valley is the focus of a large population throughout the Pre-, Early, and Late Classic periods of the Maya lowlands. However, no center dominates this valley until the very end of the Late Classic when Xunantunich is constructed and occupied. The massive architecture and use of carved monuments at Xunantunich indicate that the rulers at this site are connecting themselves with the political structure of cities to the west in the Peten. This paper will examine the socio-political development in the Valley specifically in terms of Xunantunich's late fluorescence at the beginning of the collapse.

Levi, L. (see Culbert, L.) [5]

Levine, Frances (Santa Fe Community College)

[23] DOCUMENTING TRADITIONAL CULTURAL PROPERTIES IN NON-INDIAN COMMUNITIES

Archaeologists called upon to document traditional cultural properties in American Indian communities find assistance through tribal administrative offices. In non-Indian communities there is seldom a single administrative entity where necessary contacts can be made. Suggestions are made here to direct project managers to local resources that can help to document TCPs. Religious groups, social clubs, schools and libraries are among the sources discussed. Ethnohistorical research methods are discussed as means of establishing the time depth associate with a TCP.

Levy, Janet (UNC-Charlotte)

[59] ANIMALS GOOD TO THINK: BRONZE AGE SCANDINAVIA AND OHIO HOPEWELL

Sumptuary and ceremonial objects in both Bronze Age Scandinavia and Ohio Hopewell use animal motifs as important symbols. The materials, stylization, and archaeological contexts of animal motifs are compared to investigate the use of this symbolism in the social and ceremonial life of these cultures. The variable forms and uses of animal motifs illuminate similarities and differences between these societies and contribute to the investigation of ceremony and symbolism in middle-level societies generally.

Levy, Thomas (Hebrew Union)

[110] REGIONAL INTERACTION IN THE SOUTHERN LEVANT, CA. 4500-3500 B.C.E.

In this paper, the emergence of formal cult centers is viewed as a key factor in promoting inter-regional trade and exchange in the southern Levant. Using the recent excavations at Gilat in Israel's Negev desert as a case study, the role of cult is examined in relation to expanding spheres of peer polity interaction.

Lewis, B. (see Stout, C.) [33]

Lewis, Brandon (UCLA)

[53] LATE CLASSIC MAYA ECONOMIC INTEGRATION: PERSPECTIVES FROM THE LITHIC PRODUCTION SYSTEMS AT RIO AZUL, GUATEMALA, AND RIO BRAVO, BELIZE

The nature of Maya economic integration has been the focus of much recent debate. Central to this debate is the degree to which the Maya exhibited centralized administrative control over production and/or exchange activities. Current excavations at Rio Azul, Guatemala, and Rio Bravo, Belize, provide data to address these issues. This paper examines Maya economic integration as suggested by the organization of its lithic production system. Variations in stone tool production/use at the household level, along with data from the local lithic deposits (workshops/dumps), provide the basis for this analysis.

Lewis, Brandon (UCLA)

[94] LATE CLASSIC MAYA INTEGRATION: PERSPECTIVES FROM THE LITHIC PRODUCTION SYSTEM IN NORTHEASTERN PETEN

The nature of Maya economic integration has been the focus of much recent debate. Central to this debate is the degree to which the Maya exhibited centralized administrative control over production and/or exchange activities. Current excavations in the Northeastern Peten provide data to address these issues. This paper examines Maya economic integration as suggested by the organization of its lithic production system. Variations in????? [sic]

Lewis-Williams, David (Witwatersrand) [Discussant 25]

Lightfoot, D. (see Eddy, F.) [35]

Limp, W. Frederick (Arkansas)

[72] VIEWING THE LANDSCAPES OF THE PAST THROUGH THE EYES OF THE FUTURE

Developments in the automatic data acquisition, storage, retrieval, analysis and display of archaeological data, particularly complex landscape characteristics, are fundamentally altering the way in which the record of the past should be recorded and can be understood. Specific techniques that are merging in a synergistic way include geographic information systems, multi-spectral digital imagery, global positioning systems, high resolution location recorders, visualization software and robust statistical systems for large, spatial datasets. This paper will review the background to the development of these closely linked systems over the last twenty five years, their previous application to archaeological relevant problems and the future implications of such approaches to archaeological analysis. Attention will be placed on both the technical factors and institutional responses needed to meet the challenges of change.

*Lincoln, Charles (Harvard)***[16] WAS CHICHEN ITZA LIKE ROME?**

George Kubler once wrote that "Chichen Itza is like Rome, restating whole traditions in Mesoamerican art." Ever since Sylvanus G. Morley suggested that Chichen was the capital of the Mayan "New Empire", scholars have assumed that Chichen Itza, like Rome, was the capital of an empire—variously called Toltec, Putun, or Itza. A hard look at the latest evidence regarding northern Yucatecan architecture and settlement patterns, however, does not yield any hint that Chichen Itza dominated a territory any greater than other major Maya sites such as Coba, Izamal, or even Tikal. Problems of definition can be better refined now, for instance: what do we mean by "dominate?" The terms "Itza" and "Toltec" in particular probably convey more information about ideological and religious than political or economic unity within northern Yucatan. Chichen Itza might, then, best be compared to the Rome of the Papal States era—one of many competing political powers in a crowded landscape.

*Lincoln, Elena (UCLA)***[16] INDEPENDENT CENTERS AND ISOLATED CAPITALS**

The Puuc Hills may have been the most densely populated part of the Maya Lowlands during the Late-to-Terminal Classic. Xkuchmook is but one example of the hundreds of minor cities in the Hill Country which diverge completely from the Uxmal-Kabah (or Sayil or Labna) pattern in patterns of civil construction and organization. It stood at the core of a diminutive political unit, probably not covering more than a single valley and surrounding hills, but proclaimed no obvious allegiance to any distant power or potentate. We will consider whether there are archaeological means of evaluating the independence or interdependence of such minor "capitals" whose rulers and/or elites were obviously capable of organizing and directing significant amounts of labor and material.

*Lindauer, Owen (Arizona State)***[83] WHITE WARES OF THE TONTO BASIN: BROAD SCALE EXCHANGE, EMULATION, OR BOTH?**

Decorated ceramics across Arizona from A.D. 1250 to 1350 were exchanged broadly and there is evidence that localized emulation or mimicking of several types took place. This paper presents an investigation of a white ware, Roosevelt B/W, recovered from Salado sites in Arizona's Tonto Basin. The question of whether white wares in the Tonto Basin were emulated or exchanged (or both) is evaluated through analyses of composition, design style, and form. Implications for broad scale ceramic exchange and emulation are also addressed.

*Linse, Angela (Washington)***[1] ROOM USE AND DISUSE: DECIPHERING THE DEPOSITIONAL RECORD AT BURNT MESA PUEBLO AND PUNU KUNAETE, NEW MEXICO**

Stratigraphical, sedimentological, and microartifactual descriptions and interpretations document three intrasite aspects of variability in pueblo room use and abandonment. First, individual deposits within room fill indicate that after initial abandonment and collapse, rooms were reoccupied and sites continued to be used for nonresidential purposes. Second, diverse stratigraphic sequences show that each room has a separate abandonment history and that rooms were abandoned differentially through time. Third, microartifactual assemblages from room floors extend our knowledge of room use beyond the final occupational episode by demonstrating that room use changed through time and by providing data on the nature of the change.

Lipe, William (Crow Canyon Archaeological Center) [Discussant 41]*Liss, Kenneth (Minnesota)***[35] GRAND CANYON ANASAZI SETTLEMENT PATTERNS**

Fifty-seven Anasazi settlements were identified in a survey of the Upper Basin of the Coconino Plateau, Arizona. These sites were dated according to a ceramic chronology established for the area. Site function was determined by comparing the site size, ceramic and lithic densities, and the ratio between decorated and undecorated ceramics. A hypothetical settlement pattern and subsistence strategy was reconstructed using the above data, the resource potential of the area, and ethnographic analogy. This analysis concludes that the area in question was used more intensively than previously thought and that the Upper Basin played an integral role in the subsistence strategies of the Grand Canyon Anasazi.

*Litfin, James (Cincinnati), Pamela Jackson and Kent Vickery***[91] AN EXAMINATION OF CHIPPED STONE ARROWPOINTS FROM THE MADISONVILLE SITE IN THE CENTRAL OHIO VALLEY**

Providing a basis for assessing archaeological site significance for National Register eligibility and cultural resource management decisions beyond ceramic assemblages is recognized as important,

particularly where preservation conditions are poor. Accordingly, the potential of using triangular chipped stone arrowpoints as temporal markers within the span of prehistoric and protohistoric occupation of Madisonville is explored. A classification and identification key are developed and applied to the cultural horizons in seriation fashion, and the pertinence of other typologies to the lower Little Miami Valley Fort Ancient sites is evaluated. Flint raw material utilization is also examined for possible instances of long-distance transport.

*Liu, Li (Harvard)***[71] DEVELOPMENT OF RITUAL ACTIVITIES IN NEOLITHIC NORTH CHINA**

The archaeological evidence from north China suggests that ritual practice in the Neolithic period went through two stages of development. First, in the early and middle Neolithic (6,500–3,000 BC), most ritual activities took place on a community-regional level; second, in the late Neolithic (3,000–2,000 BC) two trends were manifested. On the one hand, household ritual was prevalent in many communities on the other hand, hierarchical ritual activities, which developed towards the formation of institutionalized rites (*li*), were held in the most developed ranked societies. These rites became important social factors in the process of civilization's emergence.

*Lobdell, John (New Mexico)***[46] NORTH ALASKA PINGOS: Ephemeral Refugia in Prehistory**

Recent evaluations in the Arctic Coastal Plain of North Alaska have yielded evidence of the past human uses of pingos. These ice-core hills reflect at least two Holocene periods of climatic change throughout the Arctic. Utilization by humans provides archaeologists the opportunity to determine function, environment, and placement of these sites within a greater Arctic chronological and environmental context. Pingos are a valuable geomorphic, environmental, and archaeological resource, due to excellent organic preservation, delineated use by specialized animals, and refugia for plants. At least five pingo sites are known in North Alaska and Siberia. This paper will explore benefits and problems in utilizing pingo resources.

*Logan, Dennis (Cincinnati), Nicholas Dunning and Michael Smith***[97] ANCIENT GARDENS OF THE PUUC: SITE-WIDE SOIL SAMPLING AT SAYIL, YUCATAN, MEXICO**

A systematic, site-wide soil testing program was undertaken at the ancient Maya city of Sayil in 1992 as part of an intensive, site scale surface survey. Soils were field tested for pH and total phosphates and taxonomically classified. Laboratory phosphate fractionation was conducted on selected samples. Analysis indicates the presence of numerous garden plots among other off-platform activity areas, confirming the results of more limited investigations in 1987 and 1990. Intensively cropped gardens were established on select soils and enriched with carefully managed organic wastes.

Longacre, William [Discussant 104]*Longacre, William, Miriam Stark and Kenneth Kvamme (Arizona)***[39] YOU'VE SEEN ONE, YOU'VE SEEN 'EM ALL: ALTERNATIVE STATISTICAL TECHNIQUES TO MEASURE CERAMIC STANDARDIZATION APPLIED TO FOUR PHILIPPINE EXAMPLES**

Archaeologists assume that standardized pottery reflects production by specialists. To test this assumption, data sets from several contemporary potterymaking communities in the Philippines are assessed. The pottery includes samples from nonspecialized production (Kalinga, Luzon), full-time specialists with a technology identical to Kalinga (Carcar, Cebu) and full-time producers using Kalinga technology with the addition of the slow wheel or tournette (Gubat, Luzon). The relative utility of several statistical techniques for measuring the degree of morphological standardization is examined. New and more appropriate statistical techniques for analyzing prehistoric ceramic assemblages are discussed and pitfalls are identified.

*Longford, Nicola (Missouri Historical Society)***[28] A CONSERVATOR'S VIEW ON HOW TO COMPLY WITH NEW FEDERAL STATUTES ON CURATION AND CONSERVATION (36CFR, PART 79)**

With the passing of 36 CFR, Part 79 in 1990 those institutions responsible for the implementation of the archaeological curation regulation have opted for one of three strategies: benign neglect, smoke and mirrors, or professional compliance. The data presented in this paper is predicated on results received from telephone and written surveys of 30 institutions and data received from the Army Corps of Engineers, Technical Center of Expertise of Archaeological Curation. The data suggests that the following eight (8) factors should be minimally addressed by any institution charged with care of federal archaeological collections: building structure, building environment, storage areas, inventory control, staff infrastructure, disaster planning, pest management, and security.

*Lopez Varela, Sandra (London)***[57] THE K'AXOB CERAMICS: A REAPPRAISAL OF CERAMIC ANALYSIS AND CLASSIFICATION IN THE BELIZE REGION**

During the 1992 season, excavations were conducted in Formative and Early Classic deposits at K'axob. Results of ceramic analysis indicate a strong affiliation between K'axob and the Petén from the Mamom through the Tzakol spheres. It seems that many sites in northern Belize also share this affiliation, but the methodological approach employed heretofore, together with an overuse of the type-variety system, has prevented the acknowledgment of regional contacts between the Belize zone and the Petén. It is intended here to specify and clarify these problems in order to increase our knowledge of ceramic analysis and also of Maya society.

*Lopinot, Neal (Southern Illinois)***[42] DEMOGRAPHIC RESTRUCTURING AND POLITICAL UNIFICATION IN THE NORTHERN AMERICAN BOTTOM**

The growth of Cahokia as a regionally dominant chiefdom was accompanied early by the union of local peoples from numerous late Emergent Mississippian communities. The Cahokia site locality had a very high population density during Emergent Mississippian times, consisting of numerous small nucleated settlements scattered along virtually every alluvial ridge in the area. The results of a recent survey of large tracts of the Horseshoe Lake peninsula imply that the centralization of political authority was attended by an apparently peaceful coalescence of dispersed local population aggregates near the end of the 10th century A.D.

*Lorandi, Ana María (Universidad de Buenos Aires) and Terence D'Altroy***[73] ADVANCES IN INKA RESEARCH IN THE SOUTHERN ANDES**

Recent archaeological and documentary research, largely by scholars from Andean republics, is clarifying the development of the southern Inka empire. Radiometric dating places the imperial advance ca. 1400, doubling the presumed duration of Inka rule. Topics of special interest include the infrastructure of roads, administrative settlements, forts, and sacred places; demographic and ethnic reorganization; variations in state/subject economic and political relations; exploitation of natural resources; frontier relations; and effects on indigenous populations. These studies show that imperial rule in the south, although smaller scale than in the central Andes, was more intensive than is frequently considered the case.

*Lorenz, Karl (Gettysburg)***[67] BIG MEN, TRIBAL AND PARAMOUNT CHIEFS: SOCIOPOLITICAL VARIATION IN THE LATE PREHISTORIC SOUTHEAST**

Differences in settlement characteristics and artifact assemblages between two and three-tiered hierarchical Mississippian societies were compared across central Mississippi and western Alabama. Conclusions suggest that the patterns recovered from the two-tiered societies of Old Hoover and Lubbock Creek reflect tribally organized systems led by persons of limited political authority. Conversely, the three-tiered settlement systems of Lake George and Moundville yielded archaeological patterns reflective of status ranking. Population size and density, dietary dependence on maize, and the nature and scope of long distance exchange are variables postulated to have been primary local factors that influenced sociopolitical growth in the late prehistoric Southeast.

*Loring, S. (see Fitzhugh, W.) [19]**Lothrop, J. (see Ellis, C.) [34]**Lothrop, Jonathan, William Barse and Brad Koldehoff (Berger Assoc.)***[40] ARCHAIC AND EARLY WOODLAND OCCUPATIONS IN THE LOWER DELAWARE VALLEY**

This paper presents the results of recent excavations at three sites in Gloucester County, New Jersey. This work included investigations of Archaic (Triangle Point and Lackawaxen/Poplar Island) and Early Woodland (Teardrop Point) components. Findings from these investigations are summarized and components are individually characterized in terms of a series of settlement attributes. Based on comparisons with contemporaneous occupations elsewhere in the Delaware Valley, models are proposed that relate these Gloucester County components to larger settlement systems for the respective time periods.

*Lovis, William (Michigan)***[109] AN ISSUE OF EFFECTIVENESS—RESPONDING TO ARCHAEOLOGICAL LEGISLATION AT THE NATIONAL LEVEL THROUGH THE SAA GOVERNMENT AFFAIRS COMMITTEE**

Lobbying Congress and federal agencies on archaeologically significant issues through the SAA Government Affairs Committee requires accurate information, effective communication, appropriate

timing, interaction with other professional organizations, and the active and timely involvement of the archaeological community to be effective. This paper addresses these issues through a case study involving multi-year SAA involvement in national Native American burial and repatriation legislation. Particular attention is paid to the networks of communication related to timely involvement of the Office of Government Relations, Repatriation Task Force, the Committee on Public Archaeology, and the involvement of archaeologists with their elected representatives.

*Lozada, María, Rex Haydon and Jane Buikstra (Chicago)***[91] APPROACHES TO THE STUDY OF GENETIC COMPOSITION IN LATE INTERMEDIATE PERIOD CHIRIBAYA SETTLEMENTS, SOUTHERN PERU**

Archaeological investigations of Chiribaya (1000-1300 A.D.) sites in Southern Perú have revealed considerable cultural complexity. While this diversity has been attributed to ethnic and social differences, studies of genetic composition have not been conducted to fully evaluate these propositions. Through a comparison of non-metric traits and ancient DNA, we will explore the degree to which archaeological variability covaries with genetic markers, and thereby we will examine the role of population systematics in explaining certain archaeological phenomena. In this sense, bio-anthropological methods will be critical to the interpretation of Andean models as they relate to the Chiribaya society.

*Lubinski, Patrick (Wisconsin-Madison)***[45] FISH HEADS, FISH HEADS: AN EXPERIMENT ON DIFFERENTIAL BONE PRESERVATION IN A SALMONID FISH**

An experiment modelling the effects of cooking and soil pH on Salmonid bone survival was completed using cleaned Lake Whitefish bones. The experiment tested for preservation differences between head parts and vertebrae and between "raw", boiled, and burnt bone under both acidic and alkaline conditions. Elements were submerged in aqueous solution for 24-hour periods, removed, dried, weighed, and re-immersed. Resulting weight and element loss curves for acidic conditions suggest that 1) head Darts are destroyed more quickly than vertebrae, and 2) element destruction increases with heating intensity. Under alkaline conditions, broadly similar trends were observed, but at reduced rates.

*Lucero, Lisa (UCLA)***[75] ECONOMIC AND WEALTH VARIATION IN LATE CLASSIC MAYA COMMUNITIES: CERAMIC ANALYSIS FROM THE BELIZE RIVER AREA**

Ceramics from nine sites in the Belize River area provide an excellent database to address issues of wealth status, economic activities, and community organization. These sites encompass a variety of sizes and functions: four residential units, three lithic workshops, and two small temple compounds. Ceramics from the nine sites reflect their differences and further provide insights into how these functional differences relate to differences in wealth status. Understanding variation in activities and status reveals how communities were organized and integrated.

*Lueck, R. (see Bade, M.) [92]**Lupo, Karen (Utah) and James O'Connell (Utah)***[7] PREY ANATOMY, ASSEMBLAGE COMPOSITION AND SITE STRUCTURE AMONG THE HADZA**

Recent ethnoarchaeological research indicates that the composition of faunal assemblages and their distribution at residential base camps may be determined in part by the economic anatomy of prey as it affects both intersite transport and intrasite distribution among consumers. We evaluate this proposition on the basis of recent research among the Hadza. Specifically, we report the results of experimental work on the economic anatomy and processing costs of three species (zebra, impala and wildebeest) commonly taken by Hadza hunters. We then evaluate the effect of nutrient costs and benefits on both intersite transport and interhousehold food sharing.

*Lurie, Rochelle (Midwest Archaeological Research Services)***[96] REFLECTIONS ON THE ARCHAIC PERIOD IN NORTHEASTERN ILLINOIS: THE GARRISON SITE**

The Garrison Site is an intact, multicomponent Archaic and Woodland site in Lake Forest, Illinois. Large scale excavations in the PaleoIndian/Early Archaic and Late Archaic/Early Woodland components provide the most extensive data available on the Archaic in northern Illinois. The analysis of 400 hundred tools (including over 50 diagnostics), thousands of pieces of chipping debris (over half recovered from knapping concentrations), fire-cracked rock filled features, and some carbonized plant remains, and data from more limited testing at two other sites will be used to provide a view of subsistence and settlement patterns during the Archaic.

Lyman, R. Lee (Missouri-Columbia) [Discussant 45]

Lyman, R. Lee (Missouri-Columbia) [Discussant 89]

Lynott, Mark (National Park Service), James Price and Hector Neff (Missouri-Columbia)

[47] INFERENCES ABOUT CERAMICS AND PEOPLE IN SOUTHEAST MISSOURI:
PRELIMINARY RESULTS OF COMPOSITIONAL ANALYSIS

More than a decade of archaeological study of the Current River drainage in southeast Missouri has generated several questions about movements of people and goods, and interaction between late prehistoric groups in this region. Efforts to answer these questions have included integration of neutron activation analysis into the long-term research design. Samples of residual and alluvial clays are collected to serve as a reference for identifying the origin of Woodland, Emergent Mississippian, and Powers phase ceramics. Archaeological ceramics are selected from existing collections to answer specific inter- and intra-site questions. Results of the first 200 samples are discussed.

Lyon, Patricia (Institute of Andean Studies) [Discussant 20]

Mabry, Jonathan (Center for Desert Archaeology)

[28] HOLOCENE ALLUVIAL CYCLES AND EARLY AGRICULTURAL SETTLEMENTS IN ARID LANDS: A COMPARISON BETWEEN THE AMERICAN SOUTHWEST AND THE SOUTHERN LEVANT

Archaeological and radiocarbon dating of Holocene alluvial deposits in the American Southwest and the Southern Levant allow reconstruction of the sequences of major deposition and erosion cycles over the last 11,000 years. These alluvial sequences are sensitive records of environmental changes that profoundly affected potentials for prehistoric agriculture and sedentary settlement. Comparisons between these regions indicate similar correlations between climatic and human land-use changes, alluvial responses, and adjustments in subsistence-settlement strategies. This comparative approach, considering information from both previous and recent field studies, leads to new interpretations of the development, diffusion, and stability of early agricultural settlements in arid lands.

MacEachern, Scott (Calgary)

[64] IRON AGE AND RECENT SETTLEMENT PATTERNING IN NORTHERN CAMEROON

Archaeological and ethnohistorical investigations by the Mandara Archaeological Project/Project Maya-Wandala in 1984, 1986 and 1992 indicate that significant differences exist between the settlement patterns of later Iron Age (AD 1000-1600) and recent Wandala populations living on the plains north of the Mandara Mountains. In this paper, I will examine these differences and relate them to a general model of change in montagnard/plains-dweller interaction over the same period. I will also discuss the applicability of this model to other mountain-plains boundary zones in West Africa.

MacNeish, Richard

[18] LITHIC AND OTHER TOOLS, A SUMMARY OF THE PENDEJO DATA AND THEIR IMPLICATIONS

The meager lithic tools, representing fall activities (butchering, cooking, etc.) belong to three possible cultural complexes—Orogrande before 44,000 BP; MacGregor to 30,000 BP, and North Mesa to 14,000 BP. Although the comparative data is meager, the chopper-choppee complex of early Monte Verde, earliest Pedra Forada, El Bosque, Pacaica, the Wooley mammoth site of Santa Rosa Island, et al., may relate to Orogrande while the unifacial bone tools of MacGregor may relate to middle Pedra Fierada, Axacucho, Vasequillo, Tlapacoyan (13 and 19). Ocabal Burnham, et al., and the blade-burin, leaf panel complex of North Mesa may have even wide pre-Clovis affiliation from Los Teldos to Blue Fish Cave and Neena to the north.

Mackey, Carol (California State)

[85] ADVANCES IN NORTH COAST ARCHAEOLOGY

During the last 25 years north coast archaeology has made major advances in some areas. For example, little progress was made in refining ceramic chronologies, but major advances were made in research related to the rise and development of the state. Concurrent with the latter investigations were studies of the technology necessary for the intensification of agricultural production.

Magennis, Ann (Colorado State)

[95] HEALTH CONSEQUENCES OF COMPLEXITY AT KICHPANHA

To date, skeletal biologists have contributed little to testing hypotheses relating to increasing social complexity among the Maya. The Protoclassic/Early Classic skeletal series from Kichpanga provides the opportunity to directly examine the health consequences associated with emerging complexity. Morbidity patterns reflected by skeletal pathologies indicate that nutritional stress was a significant community health problem. The prevalence of pathologies indicative of infectious

disease also suggests that health was compromised among adults and subadults alike. The Kichpanga series provides a baseline which can be used with other contemporaneous skeletal samples to examine biological responses to inequality on a regional level.

Maher, Thomas (UNC-Chapel Hill)

[106] "... AND MILES TO GO BEFORE WE SLEEP": WHAT WE KNOW ABOUT THE MIDDLE WOODLAND IN THE AMERICAN BOTTOM

Middle Woodland studies in the American Bottom have benefited from excavations at several sites in the last eight years. The implications of excavations at four sites for reconstructing Middle Woodland subsistence, settlement, ceramic technology, and Culture chronology are briefly discussed. Much remains to be explored concerning the relationship between this Middle Woodland occupation and those in the Illinois River valley, southern Illinois, and southern Ohio. A research strategy is presented for addressing certain of these chronological and sociological problems. Finally, the effect of the "Hopewell Interaction Sphere" concept on Middle Woodland research in western Illinois is examined.

Mainfort, Robert (Memphis) and Michael Moore (Tennessee)

[22] 40LA92: A LATE MISSISSIPPAN VILLAGE IN LAUDERDALE COUNTY, TENNESSEE

40LA92 is located at the southern terminus of the First Chickasaw Bluff, approximately 5 km north of the mouth of the Hatchie River. Although sparse evidence of Woodland occupations is present, the site essentially represents a single component Late Mississippian village inhabited for roughly 150 years. Investigations at the site included a complete controlled surface collection and test excavations at selected localities. Six radiocarbon determinations place occupation of the site between A.D. 1420 and 1550, and provide the tightest temporal control for a Late Mississippian assemblage in the Central Mississippi Valley.

Malina, Robert, Terence Grieder (Texas) and Alberto Mendoza (Lima)

[9] SKELETAL REMAINS AT LA GALGADA, PERÚ

The skeletal remains of 67 individuals, 22 subadults and 45 adults, from tombs dating approximately 3400-3800 BP are considered. One tomb dated about 3400 BP includes 27 individuals. The remaining 40 are distributed in 8 tombs dated about 3700-3800 BP. Estimated life expectancy and stature are less in the more recent sample, suggesting perhaps adverse effects of nutritional and disease conditions. A variety of pathological conditions are present; perhaps the most significant involve the thoracolumbar region which may be suggestive of tuberculosis.

Malinowski, L. (see Cunningham, J.) [83]

Malinowski, Lynn (Argonne National Laboratory) and Shawn Haley (Red Deer)

[35] RECENT EVIDENCE OF THE EARLY ARCHAIC IN THE ALPINE VALLEYS OF THE WASATCH MOUNTAINS OF UTAH

During a 1992 survey of several high altitude [9,000–10,000 ft. amsl] valleys within the Manti-LaSal National Forest, numerous lithic surface scatters were recorded, ranging from isolated finds to extensive scatters covering ten hectares or more. Despite the wide variation in size and density, all of the scatters appear to represent the Early to Middle Archaic Periods. Several alternative explanations, including the impact of the Altithermal climatic stage, are presented as to why the Archaic Period peoples were so heavily represented at these upland canyon sites, while earlier and later groups appear to be underrepresented.

Mandel, Rolfe (Nebraska-Omaha) and E. Arthur Bettis III (Iowa)

[43] RECOGNITION OF THE DEFOREST FORMATION IN THE MIDWEST U.S.A.: IMPLICATIONS FOR ARCHAEOLOGICAL RESEARCH

Recent investigations of Holocene alluvial stratigraphy and chronology in the Midwest documented the presence of the DeForest Formation, a lithostratigraphic unit encompassing all Holocene alluvium. The formation is subdivided into four members: Camp Creek, Roberts Creek, Gunder, and Corrington. The members of the DeForest Formation have a systematic distribution within drainage networks and are mappable. Therefore, recognition of the DeForest Formation in the region has important implications for locating buried cultural materials and explaining apparent gaps in the archaeological record. Once the distribution of the formation's members is defined for an area, potentials for buried archaeological deposits dating to certain cultural periods can be determined. Hence, the DeForest Formation provides a stratigraphic framework for locating the buried archaeological record in a large portion of the Midwest.

Mandryk, Carole (Grant MacEwan)

[113] A HISTORICAL AND SOCIOPOLITICAL ANALYSIS OF THE ICE-FREE CORRIDOR

This paper examines the historical and theoretical influences that have affected the analysis and interpretation of the ice-free corridor. As originally conceived in the 1930s, the corridor was a deglacia-

tion feature. When C14 dates in the 1950s demonstrated noncorrelation of the corridor's opening with archaeological sites on the Plains, the need for a Late Wisconsinan maximum corridor arose. This need for a corridor during maximum ice extent, along with the influence of American ideology, contributed to a focus on the question of existence of the corridor at the expense of understanding what the corridor was actually like.

Manning, Stuart (Reading, U.K.)

[78] END OF THE EARLY BRONZE AGE IN THE AEGEAN: CONTEXT, CHRONOLOGY, CAUSES, AND EFFECTS

The mid-third millennium BC witnesses the development of complex 'chiefdom' societies on the Greek mainland, in the Cycladic islands, and on Crete. However, this period then comes to an abrupt end in archaeological terms, marked by dislocation across the Aegean; especially on the mainland where sites are destroyed and a new material culture appears, and in the Cyclades, where new cultural traits occur and the previous civilization vanishes. This paper examines the social context in which such change occurred, the chronology of events, climatic and geomorphological associations, suggested causes, and the role of these elements in the rise of the Minoan palaces.

Manzanilla, Linda (Mexico)

[16] TEOTIHUACAN

Without doubt, Teotihuacan was the first large-scale urban development of the basin of Mexico. The largest settlement in the Central Highlands of Mexico, the main ritual, pilgrimage, manufacturing, and exchange center, and the capital of a complex society, Teotihuacan was the model which later Mesoamerican capitals copied. Monumentality was an external representation of these characteristics.

Marino, Bruno (Andover Foundation of Archaeological Research)

[18] STABLE ISOTOPE-BASED PALEOENVIRONMENTAL RECONSTRUCTION AT PENDEJO CAVE

Past climates offer a unique opportunity to study long and short time climate (and perhaps C-4 dietary) systems. High resolution proxy studies of plant remains, paleosols, and pedogenic carbonates from Pendejo Cave and its packrat middens, document 40,000 years of biogeochemical cycles. Powerful tracers of key climate regulators (the stable isotopes of carbon, hydrogen and oxygen, including prehistoric CO₂ levels) provide data on carbon and hydrologic cycles in the American Southwest circa 20-40,000 BP. These studies also provide an important adjunct to data obtained from ice cores and marine sediments.

Marshall, Fiona (Washington-St. Louis) and Tom Pilgram (Washington)

[7] TETEMWET: AN OKIEK ROCKSHELTER AND THE IDENTIFICATION OF GENDER BASED USE OF DOMESTIC SPACE

Material culture from Tetemwet, an Ogiek rockshelter in Kenya shows marked spatial variation based on gender. Information from interview of people who have used the shelter, oral history, and excavation shows these differences reflect task and dietary differentiation, chiefly the way that women use hearths for boiling and food preparation for the group, and men use hearths for warmth and for roasting meat. As a result there are differences between men's and women's areas of the shelter in the size and shape of charcoal from hearths, and aspects of the faunal assemblages including patterns of bone breakage and burning.

Martin, Terrance (Illinois State Museum) John Anderton USDA Forest Service) and John Franzen (USDA Forest Service-Hiawatha National Forest)

[108] NORTHERN EXPOSURE: LATE WOODLAND ENVIRONMENT AND SUBSISTENCE IN THE HIAWATHA NATIONAL FOREST OF NORTHERN MICHIGAN

Interdisciplinary studies can contribute significant information on paleoenvironments and thus, provide a more holistic perspective for wildlife and habitat management on our public lands. Forest Service-sponsored investigations at the Ogontz Bay site on the north shore of Lake Michigan revealed evidence pertaining to the local shoreline ecosystem when the site was occupied by Late Woodland/Oneota groups. The prehistoric faunal assemblage, which was preserved by the site's unique soil chemistry, also reflects the relative economic importance of various local resources (especially spring spawning lake fish) as well as the use of animal products for technology and ideology.

Maschner, H. (see Lambert, P.) [1]

Mason, Owen (Alaska Quaternary Center), S. Craig Gerlach (Alaska) and Lisa Graumlich (Arizona)

[46] CLIMATIC CONSTRAINTS OF TECHNOLOGICAL TRANSITIONS IN NORTHWESTERN ALASKA

Numerous researchers propose that human prehistory in the western arctic is controlled by climatic fluctuations; however, most of the data used is extra-regional. Our research on Kotzebue Sound beach

ridges and Kobuk River valley tree-rings shows that several periods of heightened storms occurred during 3300-1700 14C yr B.P., 1200-800 14C yr B.P. and 400-200 14C yr B.P. Warmer intervals prevailed 4000-3300 and 1700-1200 14C yr B.P. Significantly, major cultural transitions co-occur with these climatic intervals, specifically the Arctic Small Tool to Choris transition, after 3D00 14C yr B.P. and the Ipiutak/ Birnirk to western Thule transition, ca. 1200 to 1000 14C yr. B.P.

Masson, Marilyn (Texas)

[57] K'AXOB CACHES AND COMPARATIVE CONTEXTS: MODELS OF RITUAL ACCOMPANYING PRECLASSIC DEDICATORY EVENTS

Caches recovered from Preclassic and Protoclassic contexts at K'axob, Belize, show patterned variability in vessel form, cache contents, and placement within architectural features. The K'axob patterns are compared to those observed throughout the Maya lowlands. Types of ritual events associated with cache placement described in ethnographic and ethnohistorical accounts and Classic period Maya inscriptions are examined in order to reconstruct ritual contexts which correlate with cache forms recovered in the Preclassic and Protoclassic archaeological record. Particular attention is paid to the association of animal sacrifice with calendrically-based dedication ceremonies.

Masucci, Maria (CMRAE-MIT)

[27] EXPLAINING CERAMIC CHANGE: TECHNOLOGICAL ANALYSIS OF LATE PREHISTORIC ECUADORIAN CERAMICS

Compositional analyses such as petrographic thin section analysis are increasingly being used in studies of ceramic provenience and technology. In this study of Guangala Phase ceramics (100 BC-AD 800) from Southwest Ecuador this method is combined with stylistic analysis to investigate technological shifts through time in coarse paste utilitarian pottery. Analysis of local clays are included to consider if changes are due to differing resource use or the presence of nonlocal products. The research utilizes a portion of the ceramic assemblage previously believed to hold little cultural or chronological information for investigating this poorly known period.

Matos, Ramiro (Smithsonian) [Discussant 20]

Matos, Ramiro (Universidad National Mayor de San Marcos) and Charles Hastings (Central Michigan)

[85] ARCHAEOLOGICAL RESEARCH IN THE CENTRAL PERUVIAN HIGHLANDS, 1967-1992

Roughly a quarter-century ago two areas of the central Peruvian sierra were emerging as major foci for long-term archaeological research in the region. Around Huanuco in the north, anthropologists sought to demonstrate how history and archaeology could work together in studies of native ethnic groups, imperial conquest, and a little-known idea called "verticality." In Ayacucho far to the south-east, a large scale, multi-disciplinary project would soon begin with different sorts of goals relating more to gradual changes in settlement and subsistence. Many of the general research trends evident over the next two decades across this region were to a large extent anticipated by these projects.

Matsui, Akira (Nara National Cultural Properties Research Institute)

[4] AWAZU LAKE BOTTOM SITE: A STUDY OF SUBSISTENCE-SETTLEMENT SYSTEMS IN WESTERN HONSHU

The archaeological excavation of Awazu Shellmidden on the bottom of Lake Biwa provides us with extremely well preserved faunal and floral remains as well as various kinds of artifacts from the Initial to the Middle Jomon periods. In this paper, the excavation results of the Awazu Middle Jomon layer are used to examine the Jomon subsistence settlement systems in western Honshu. Quantitative analysis is applied to the faunal, floral and artifact samples from the site. The results are compared with the Middle Jomon data in eastern Honshu and are discussed in relation to the environment.

Matthews, M. (see Trierweiler, W.) [1]

Mavalwala, Jamshed (Toronto)

[18] HUMAN DERMATOGLYPHICS ON BURNED CLAY FROM PENDEJO CAVE, NEW MEXICO

Eight pieces of hearth fired clay bearing palm or finger prints have been found, divided between zones C-D (15,000-17,000 BP), zone I (31,000 BP), and zone K (36,000 BP). They all show evidence of human skin impressions. The clay was fired after the impressions were made. All the structures imprinted are in accordance with human dermal skin, including minutia and sweat glands openings. Even though the impressions are reversed in the clay, they are of human imprint and could not have been made by other sources.

Maxwell, Morreau (Michigan) [Discussant 19]

Mazzullo, S. J. and C. S. Teal (Wichita)**[13] RECONSTRUCTING PROCESSES OF PRODUCTION AND SITE FORMATION THROUGH MINERALOGIC ANALYSIS OF MAYA CULTURAL REMAINS, AMBERGRIS CAYE, BELIZE**

Mineralogic analyses confirm that a mass-produced, unslipped pottery type from Maya Late Classic levels at the Santa Cruz site on Ambergris Caye was tempered with material that could only have come from the mainland. The pottery fabric was found to be consistent with kaolinite clay from a nearby source. The mineralogy of interbedded semi-lithified white layers suggests the burning of limestone for use in making plaster. These data add to our knowledge of exchange and production technology in the past, as well as to the reconstruction of site formation processes that have produced the soils of the present.

McAnany, Patricia (Boston)**[57] THE ROLE OF THE ANCESTORS IN ARCHITECTURAL TRANSFORMATIONS AT K'AXOB, BELIZE**

Ancestral interments within the core of a residence represent a means of reckoning genealogy, naming and claiming a place as well as associated resources. In the Maya lowlands, at sites with pronounced occupational duration there is a tendency for ancestral burial locales to undergo a transformation to progressively ritualized places. Such a pattern is evident in the Formative/Classic period deposits of K'axob. Stratigraphic and burial data from three seasons of excavation are presented in order to demonstrate the crucial and determinative role of ancestral interments in the transformation of K'axob from a nucleated Middle Formative village to a Late Classic dispersed community.

McCarthy, Allen (Arkansas), Douglas Veltre and William Workman (Alaska-Anchorage)**[19] THE SOUTHERN ALASKAN PREHISTORY: AN OVERVIEW**

Significant results of recent research and CRM projects between the Aleutian Islands and the southeastern Alaskan littoral will be summarized. Systematic surveys of unstudied regions, study of coastal uplift, subsistence, and erosion, discovery of well preserved early/mid-Holocene sites, and excavation of early Russian period sites are among the points to be considered. This subarctic region is archaeologically important because ancestral Alcutes, Pacific Eskimos, and coastal Indians were some of the earliest in Alaska to engage in maritime subsistence, and because they formed some of the largest populations in late prehistoric times.

McConaughy, Mark (Pennsylvania)**[63] EFFECTS OF CULTURAL RESOURCE MANAGEMENT ON COLLECTION STRATEGIES AT THE SECTION OF ARCHAEOLOGY, THE STATE MUSEUM OF PENNSYLVANIA**

Prior to 1980, the Section of Archaeology, The State Museum of Pennsylvania collections were produced through self-generated research projects. A shift in emphasis occurred during the 1980's when the Section of Archaeology became primary repository for Culture Resource Management (CRM) collections originating from Pennsylvania. Instead of a few new collections requiring curation each year, over 76 CRM firms now generate collections for curation. The Section of Archaeology has reached designed storage capacity, but remains committed to being the primary repository for Pennsylvania CRM collections. Collection storage space is the main problem to be addressed in the 1990's.

McCormack, Valerie, Hope Henderson and Francisco Estrada-Belli (Boston)**[57] DOCUMENTING THE ELUSIVE PROTOCLASSIC AND EARLY CLASSIC SETTLEMENT: STRATIGRAPHIC EVIDENCE FROM K'AXOB**

It has been suggested that the ceramic complexes from the Protoclassic and Early Classic periods are a manifestation of an intrusive elite strata of society. At K'axob, status maintenance objects, such as polychromes and maniform tetrapods, are present within burial and cache deposits within modest household settings. This stratigraphic evidence calls into question the association of the Freshwater-Floral Park and Nuevo Tzakol ceramic complexes with an intrusive elite strata of society. We suggest, instead, that the definition of the Protoclassic and Early Classic periods should include uninterrupted local and community development on all rungs of the site hierarchy.

McCorvie, M. (see Morrow, C.) [22]**McCorvie, Mary (USDA Forest Service-Shawnee Forest) and Carol Morrow (Southeast Missouri)****[108] The Occurrence of the North American Buffalo in the Eastern Woodlands**

Although historical accounts of buffalo in the eastern U.S. vary a great deal in regard to reported herd size, their presence east of the Mississippi River is beyond question. The earliest references to buffalo in the eastern woodlands refer them as "Illinois cattle," apparently because they occurred in largest numbers in the prairie portions of Illinois and Indiana, the Grand Prairie being an eastern

extension of their western range. There are also many references to these animals in the forested portions of the east. The remains of these creatures are seldom found on prehistoric archaeological sites, but are recovered in limited numbers from Historic Native American village sites. This paper will combine the historical and archaeological records in an attempt to determine the spatial and temporal impact of these large mammals on the eastern woodlands of the United States.

McCutcheon, Patrick (Washington)**[22] QUANTIFYING LITHIC RAW MATERIAL VARIABILITY OF CROWLEY'S RIDGE GRAVEL, SOUTHEAST MISSOURI AND NORTHEAST ARKANSAS**

The Pliocene gravel deposits of Crowley's Ridge are the only "local" lithic raw material source for the central Mississippi alluvial valley. Surprisingly, this source has been little studied in terms of composition and size. We report preliminary investigations that quantify size and fracture toughness of this resource in Southeast Missouri and Northeast Arkansas. Examination of select archaeological assemblages demonstrate how this variability was exploited in the past.

McEwan, Colin (The Art Institute of Chicago)**[62] THE LIMITS OF EMPIRE: THE INCA OCCUPATION OF COASTAL ECUADOR**

The dearth of Inca archaeological remains from the mainland coast of Ecuador, has led some scholars (eg. Estrada 1987) to question the veracity of Inca claims to conquest. On the other hand the capac hucha burials found on Isla de La Plata (McEwan and Silva 1989, McEwan and Van de Guchte 1992 [in press], McEwan n.d.), are clearly expressions of a state ritual intended to delineate Inca sacred geography and to mark the territorial limits of empire. Archaeological and ethnohistorical evidence is reviewed to provide a more coherent picture of Inca attempts to secure control of their northern frontier.

McGuire, Randall (SUNY-Binghamton) [Discussant 107]**McGuirt, Michael (Texas at Austin)****[35] THE RECENT DISCOVERY OF A TERMINAL ARCHAIC TO INITIAL MOGOLLON PROTOKIVA IN THE MIDDLE SAN FRANCISCO RIVER VALLEY, WEST-CENTRAL NEW MEXICO**

At the inception of the Mogollon archaeological culture, Archaic nomadism was being eclipsed by the emergence of village agriculture. A paradigm that posits religious ritual as the primary sociocultural mechanism for this transformation served as the basis for a model that was tentatively validated by the discovery of a protokiva at the HO Bar site, a terminal Archaic to initial Mogollon pithouse village. Religious ritual satisfied organizational requisites during the initial aggregation of multiple societies within the Mogollon culture area. Nonrandom village layout patterns that include a communal structure as a spatial focus are the archaeological reflection of these processes.

McKeown, Timothy (National Park Service)**[86] LEGISLATING THE DEAD: NEGOTIATION AND THE NATIVE AMERICAN GRAVES PROTECTION AND REPATRIATION ACT (NAGPRA)**

NAGPRA represents the culmination of a lengthy legislative process mediating the diverse interests of museums, scientists, and Native Americans regarding the proper treatment of human remains and certain cultural items. This paper uses the legislative history of the statute to highlight the major disputed issues, including the type of items covered, criteria for determining right of possession, identification of groups eligible to make claims, applicability, and implementing procedures. Many of the major issues raised during the legislative process were effectively resolved with the statute's passage. Other issues require clarification through the ongoing regulation process, while others may be resolved in the courts.

McKillip, Heather (Louisiana)**[93] PREHISTORIC COASTAL MAYA USE OF NATIVE PALMS**

The use and significance of native palms by the ancient coastal Maya is evaluated. The identification and quantification of palm nuts from Maya sites in south coastal Belize (A.D. 300-1400) provides a rare glimpse of coastal Maya diet, with remains preserved due to anaerobic soil. Comparative and ethnobiological data support the view that tree-cropping, especially native palms, was a viable subsistence strategy for the coastal Maya on offshore islands where land was limited.

McKinney, Curtis (Center of American Archeology)**[28] URANIUM SERIES AND ESR DATING OF TOOTH ENAMEL, METHODS IN CONFLICT: THE URANIUM UPTAKE DEBATE**

The application of U-series and ESR methods to tooth enamel for determining Paleolithic chronologies depends on contradictory assumptions of the timing and mode of U uptake. In ESR, linear U

uptake is assumed since it produces ages compatible with prior age assumptions. However, in U-series dating, early U uptake has been demonstrated by comparison with radiocarbon chronologies at Boney, Trolinger, and Jones Springs, thus calling in question the chronologies generated by ESR dating of tooth enamel.

McManamon, Francis (National Park Service) [Discussant 109]

McManamon, Francis (National Park Service)

[86] REGULATIONS IMPLEMENTING THE NATIVE AMERICAN GRAVES PROTECTION AND REPATRIATION ACT: A STATUS REPORT

A variety of actions are needed to implement the Native American Graves Protection and Repatriation Act of 1990. These range from the bureaucratic establishment of a review committee mandated by the law, to the development of regulations, to providing training in various aspects of compliance and administering a grants program. This paper reports the status of these actions and discusses issues related to them.

McNair, Anna (Southern Illinois)

[9] THE INCREASING ECONOMIC IMPORTANCE OF WOMEN IN PRECERAMIC PERU

This paper will specifically address changes in social relations as inferred by the imbalanced division of labor and women's increasing economic and implicit social value. Skeletal evidence from the preceramic site of Paloma, located on coastal Peru, demonstrates that over time, gender-specific activities increased. In the early occupation levels, men and women were involved in similar undertakings. By the final occupation period, however, men and women were engaged in different types of subsistence tasks. The reasons for these changes in men's and women's work may be linked to the transition from hunting and gathering to sedentism based on a maritime economy.

McPherron, Shannon (Pennsylvania)

[111] THE OVERLOOKED IMPORTANCE OF ABSOLUTE SIZE IN PREDICTING ACHEULIAN BIFACE MORPHOLOGY

Typological analysis of Acheulian biface variability is based on measurement ratios which describe shape. Ratios remove any consideration of size from biface type assignments. Biface size is considered incidental. This approach has not contributed to an explanation of biface variability. It can be shown that the shape ratios themselves are directly related to biface size. Factors which effect size, such as local raw materials and intensity of utilization, explain much of the variability measured with biface typologies.

McVicker, Donald (North Central)

[63] MUSEUMS, COLLECTIONS AND WORLD'S FAIRS

The 1904 Louisiana Purchase Exposition offered the Bureau of American Ethnology and the US National Museum an unparalleled opportunity for the gathering and display of collections. This paper analyzes the strategies employed by the curators and their colleagues to obtain objects, the competitive stances of institutions for the attention of the public, and the enduring consequences of these rivalries on the development of museum collections and the departments that house them.

Meadow, R. (see Possehl, G.) [78]

Meadors, S. (see Vradenburg, J.) [9]

Mehrer, Mark (Northern Illinois)

[96] NEW PERSPECTIVES ON LATE WOODLAND IN NORTHERN ILLINOIS

Once again the good, gray culture, Late Woodland, proves upon examination to be more colorful than expected. The results of recent excavations by Northern Illinois University stimulated a re-examination of previous research that revealed an increasingly complex and diverse picture of late prehistoric times in northern Illinois. An expanded range for the Effigy Mound culture, a newly defined complex of non-effigy mounds, and the results of large scale test excavations are part of a new perspective on this time period.

Mendoza, A. (see Malina, R.) [9]

Mendoza, Ruben (Colorado-Denver)

[53] THE OLOMAN TYRANNY: CARTEL FORMATION AND ARCHAEOLOGY OF CONQUEST INTERACTION

Recent findings from circum-Basin Mesoamerica have dramatically altered prevailing interpretations of the nature and intensity of Late Classic (A.D. 550-850) warfare in the hinterland of the Teotihuacan state. This paper reviews current evidence for the proliferation of a Gulf lowland-based pattern of militarized developments that enveloped highland central Mexico in the period dominated

by the decline of Teotihuacan and the emergence of El Tajin, Cacaxtla, and Xochicalco. It will be argued that Late Classic Gulf lowland sociopolitical patterns were replicated in highland contexts, and that a multi-ethnic confederation or cartel of Oloman city-states is implicated in the transformative process.

Mertens, Steven (Illinois)

[14] PRELIMINARY INVESTIGATIONS CONCERNING THE TRANSITION FROM MIDDLE TO UPPER PALEOLITHIC IN ROMANIA

Of the numerous Paleolithic sites excavated during the 1960's, several contain both Middle and Upper Paleolithic stratified cultural levels. A new radiocarbon chronology has provided a tentative framework for a better understanding of the Romanian Middle and Upper Paleolithic. Recent excavations at the sites of Pestera Cioarei and Mitoc Malul Galben have provided valuable information concerning this topic. The nature of the transition in Romania will become essential in fully understanding the complexity of the transition in Eastern Europe.

Meskill, F. (see Reese-Taylor, F.) [95]

Meskill, Frances (Texas at Austin)

[95] INNOVATION, RENOVATION, SYMBOL, AND PLACE: A PROTOCLASSIC PERSPECTIVE FROM THE SITE OF KICHPANHA, NORTHERN BELIZE

The relationship of Protoclassic ceramics to evolving complexity in the Maya Lowlands is approached from an ideational perspective in this paper. Patterns of context, distribution, and symbolism are considered in a review of Protoclassic data from a number of sites. Findings from the northern Belize site of Kichpanha are discussed to illustrate the proposed relationship.

Metcalf, Mary (Virginia)

[100] POLITICS AND ARCHITECTURE: PATTERNS OF LABOR INVESTMENT IN THE NORTHERN SOUTHWEST

Arguments which connect architectural labor and political organization often concentrate on monumental architecture; however, all forms of architecture may be considered. This study links changes in architectural labor investment with changes in political organization. The labor involved in civic and private construction is compared within and between sites. Civic construction includes kivas, towers, and multiwall structures. Both volume of architecture and difficulty of building technique are considered. Data from the Mesa Verde and Chaco Canyon regions between A.D. 1000 and 1300 are used.

Meyers, Thomas (US Army Corps of Engineers) and Michael Trimble

[92] ARCHAEOLOGICAL RECORDS MANAGEMENT AT MILITARY FACILITIES: A REGIONAL PERSPECTIVE

Needs assessments for archaeological collections under the jurisdiction of DoD installations are necessary for bringing agencies into compliance with federal curation requirements. However, a frequently overlooked element of the assessment process involves the identification and preservation of all documentation associated with collections. Without associated documentation, the research value of collections is diminished significantly, reducing collections to the status of mere museum curios. Recent needs assessments for the Department of Defense revealed that collection documentation is usually disassociated from collections, improperly prepared for storage, and housed in environments detrimental to their preservation. An archives management program to correct deficiencies is presented.

Michals, Lauren (California-Santa Barbara)

[102] THE OLIVER SITE AND EARLY MOUNDVILLE PHASE ECONOMIC ORGANIZATION

Little is known about the economic relationship between early Mississippian Moundville phase populations (AD 1050-1250). Various classes of material recovered from the Oliver site, an early Moundville I phase farmstead, are used to examine the relationships between outlying farmsteads, single mound centers, and the emerging regional center of Moundville. A general lack of difference in the material remains from the Oliver site and from an early single mound center, 1Tu50, is discussed in detail.

Middleton, William (Wisconsin-Madison)

[50] THE IDENTIFICATION OF PRE-HISPANIC COCA CONSUMPTION THROUGH OPAL PHYTOLITH ANALYSIS OF DENTAL CALCULUS

Opal phytoliths can be extracted from dental calculus and identified- this approach has proven useful in the reconstruction of herbivore diet. Since humans rarely eat siliceous portions of plants, however, this method is of use only in certain instances. One such instance appears to be the

identification of coca consumption (*Erythroxylum coca*, *E. novogranatense*, & *E. truxillense*). In a study conducted on ten prehispanic crania from five Peruvian sites, phytoliths resembling those from coca were found in six cases. Since coca produces phytoliths of low taxonomic value, much comparative work still needs to be done. Results to date, however, are promising.

Middleton, William (Wisconsin-Madison)

[61] THE USE OF OPOL PHYTOLITH ANALYSIS IN PALEOECOLOGICAL RECONSTRUCTION ON ST. CATHERINE'S ISLAND, GEORGIA

Opal phytolith analysis offers unique opportunities for detailed microecological reconstruction. A drawback to regional ecological reconstruction is that many samples over a wide area are required. To achieve this a quick and inexpensive means of collecting samples has been developed. In an ongoing project on St. Catherine's Island, Georgia, soil samples have been collected along several transects intersecting several archaeological features using a hand operated coring tool. Analysis of these samples has enabled a fairly fine grained reconstruction of both archaeological and ecological features, including the identification of an ambiguous geological feature as anthropogenic and the identification of cultivated areas.

Miksa, Elizabeth (Arizona)

[83] IDENTIFYING THE ORIGIN OF CERAMIC TEMPERING SANDS USING PETROGRAPHIC POINTCOUNT ANALYSIS: AN EXAMPLE FROM CENTRAL ARIZONA

Petrographic pointcount analysis is an established technique for the determination of local versus non-local tempering sands in ceramic assemblages, where local sands can be identified. The Tonto Basin, in Central Arizona, is an ideal location for the application of this technique. A sand database developed using established sedimentological sampling methods is presented. Correspondence analysis and discriminant analysis are used to delineate geographically and compositionally discrete sand composition zones. Discriminant analysis is used to assign temper found in individual sherd to composition zones. Finally, techniques for the application of compositional data to the vast quantity of archaeological ceramics are presented.

Miksicek, Charles (BioSystems Analysis Inc.)

[5] ARCHAEOBOTANICAL EVIDENCE OF PREHISTORIC AGRICULTURE INNOVATION AT PULLTROUSER SWAMP, BELIZE

Charred botanical remains and mollusks recovered by flotation at Pulltrouser Swamp (in 1979 and 1981) provide ample evidence for changing agricultural patterns. The available data suggest a system of long-fallow upland farming, coupled with door-yard orchard/garden horticulture, began in the early Middle Preclassic. By the Late Preclassic, fallow periods were shortened and a system of intensive channelized field production was adopted. Evidence from both settlement and field contexts is consistent with the hypothesis that Late Classic Maya farmers maximized production by combining short-fallow milpa, dooryard garden, and island field systems. Multiple lines of evidence are necessary to understand these complex and variable, relict agricultural features.

Miller, George (California State)

[85] FROM SPECIES LISTS TO TAPHONOMIC RECONSTRUCTION: 25 YEARS OF ZOOARCHAEOLOGY IN THE CENTRAL ANDES

This paper reviews the accomplishments of the past 25 years in the field of Andean Zooarchaeology, and outlines the major research questions that need to be addressed in the next 25 years.

Miller, J. (see Kwiatkowski, S.J.) [107]

Miller, M. (see Francis, J.) [11]

Miller, Patricia (Archaeological and Historical Consultants)

[17] A COMPARATIVE ANALYSIS OF LATE WOODLAND SETTLEMENT WITHIN THE SUSQUEHANNA RIVER DRAINAGE

Recent Cultural Resource Management studies have provided new information on the Late Woodland occupation of the Susquehanna River drainage. Portions of several village sites have been excavated and found to contain well-preserved food remains within semisubterranean keyhole structures. Investigations at Late Woodland sites remote from the Susquehanna River floodplain have provided data to elucidate a broader range of settlement and subsistence behavior. Coupled with explicit reconstructions of wild plant food and agricultural productivity, the information provides interesting comparisons of Late Woodland resource use between sites along major floodplains and those in other localities.

Miller-Antonio, Sari (Arizona)

[39] LITHIC VARIABILITY IN UPPER PLEISTOCENE NORTHERN CHINA

Lithic assemblages from the Salawusu Site in Inner Mongolia and the Shiyu Site in northern Shanxi have been assigned to the 'small tool' tradition as defined by contemporary Paleolithic archaeologists

in China. This paper addresses the variability within this tool tradition through a quantitative and qualitative comparative lithic analysis. A critical discussion of the radiocarbon dates for these sites and a correlation of their stratigraphy with oxygen isotope chronology suggests these sites are separated by a much greater temporal span than their radiocarbon dates have indicated. The results of the lithic analyses also call into question the closeness of the relationship between these assemblages.

Mills, B. (see Senior, L.) [36]

Milner, George (Penn State) [Discussant 102]

Milner, George (Penn State)

[42] THE CAHOKIA SITE IN A REGIONAL CONTEXT

Recent work highlights significant differences of opinion about Cahokia and its satellite communities, especially regarding this prehistoric society's organizational structure, scale, and stability. Existing collections from several hundred Illinois and Missouri sites in floodplain and upland settings provide a fresh perspective on the occupational histories and disposition of major and minor settlements, as well as the geographical distribution of sites with assemblages closely approximating those of Cahokia. Interpretations of these data differ sharply from conventional wisdom—they are consistent with a more modest sociopolitical system than the standard view of a heavily populated, stable, and mighty Cahokia that dominated far-flung peoples.

Minor, Rick (Heritage Research Associates) and Lynda Walker (US Army Corps Engineers-Portland District)

[92] LATE PREHISTORIC CULTURAL DYNAMICS IN THE COLUMBIA RIVER GORGE, OREGON AND WASHINGTON

As a result of its construction and management of the Bonneville and The Dalles Lock and Dam projects, the Portland District, U.S. Army Corps of Engineers has been the primary sponsor of archaeological research in the Columbia River Gorge. Archaeological evidence indicates that fundamental changes occurred in the distribution of native groups in the Gorge in late prehistoric times. An earlier cultural pattern with Plateau affinities was replaced by ethnographic Chinookan peoples affiliated with the Northwest Coast. This evidence for late expansion of Northwest Coast peoples up the Columbia River requires a rethinking of much of what has been written about the prehistoric cultures of the Lower Columbia Valley.

Mitchem, Jeffrey (Arkansas Archaeological Survey)

[10] EXCAVATIONS AT THE LATE MISSISSIPPIAN PARKIN SITE, NORTHEAST ARKANSAS

The 1992 excavations at Parkin Archeological State Park were concentrated in two locations that had been started in 1991. In both areas, multiple superimposed structure floors were found at different levels. Excavations were primarily designed to gather architectural information about these buildings for interpretation purposes. Floors and associated features yielded abundant faunal and floral remains. Artifacts and stratigraphic details suggest that these structures date from the late Parkin Phase occupation of the site.

Mithen, Steven (Reading)

[34] MESOLITHIC TECHNOLOGY IN THE SOUTHERN HEBRIDES

Some of the richest Mesolithic sites in Britain are found in the southern Hebrides, the islands of Oronsay, Jura, Islay and Colonsay in Western Scotland. This paper will review the excavations at three such sites, Staosnaig on Colonsay, Gleann Mor & Bolsay on Islay, all dated to c. 8000 BP which have been conducted since 1988. The technological and typological variability within and between sites will be examined and discussed in the context of raw material availability and changing environments and economic patterns from the time of the colonization of Scotland to the adoption of agriculture.

Mock, Shirley (Texas)

[94] WHEN IT RAINS IT POURS: ADDITIONAL EVIDENCE OF SALTMAKING TECHNOLOGY AT THE NORTHERN RIVER LAGOON SITE IN BELIZE, CENTRAL AMERICA

Recent research on the coastal lagoon sites of Belize has revealed substantial evidence supporting the production of salt through the evaporative process of sal cocida during the Maya Late-Terminal Classic period. A distinctive artifact inventory associated with this process has been uncovered at the Northern River Lagoon site in northern Belize, suggesting that salt production played a significant role in settlement and economy. The evidence from Northern River Lagoon supports additional inferences pertaining to interregional differences in both salt production strategies and degrees of specialization.

Moeller, Konnie (Argonne National Laboratory) and John Hoffecker (Argonne National Laboratory)

[35] A GEOARCHAEOLOGICAL ANALYSIS OF HYDROPOWER OPERATION EFFECTS ON THE GREEN RIVER IN UTAH AND COLORADO

During the summer of 1992, Argonne National Laboratory undertook a geoarchaeological study of hydropower operation effects on sites located downstream of Flaming Gorge Dam. Prehistoric sites range from small lithic scatters to larger sites with features, and historic sites include trash scatters and sites with multiple structures. Data were collected from sites along the lowest terrace levels regarding sedimentary context, slope, vegetation, relation to current stream channels, and general condition. These data were used in conjunction with projected changes in water level and sediment load to predict erosion potential.

Moffat, Charles (Wisconsin) and Constance Arzigian (Wisconsin-LaCrosse)

[98] LAKESIDE LATE WOODLAND CAMPSITES AND WILD RICE: NEW DATA FROM NORTHERN WISCONSIN

In 1991 and 1992 the Mississippi Valley Archaeology Center carried out test excavations at three small Late Woodland campsites at Rice Reservoir in the upper Wisconsin River drainage. These investigations uncovered pit features containing large quantities of burned rock. Flotation samples from the features contained carbonized wild rice and the seeds of wild fruits. Faunal remains included beaver, muskrat and fish. Associated ceramics were Madison Cord Impressed and Point Sauble Collared. The data suggest that a subsistence pattern focusing on the exploitation of wild rice, fish and aquatic mammals had developed before A.D. 1300 in northern Wisconsin.

Moholy-Nagy, Hattula (Michigan)

[53] DEBITAGE DISPOSAL AND ARTIFACT PRODUCTION AT TIKAL, GUATEMALA

In urban settings the world over, the disposal of durable waste is a universal problem with diverse solutions. The spatial constraints operating at large sites in the Lowland Maya area favored the landfilling of trash in architectural fill and other kinds of deposits. Even though virtually all refuse is found in secondary context, the manner in which Tikal's population disposed of different classes of durable waste provides important insights into the production of artifacts of chert, obsidian, shell, and bone.

Mohs, Gordon (Sto:lo Tribal Council)

[3] SXWOXWIYAM STL'TL'AQEMTE STO:LO, SPIRITS OF THE ANCESTORS

Sxwoxwiyam Stl'agen te Sto:lo, Spirits of the Ancestors. A look at the sacred grounds of the Sto:lo Indians of southwestern British Columbia: the stories, the traditions, the landscape, the government, the lawyers, the archaeologists, aboriginal rights and title, and the future.

Montana, A. (see Jackson, E.) [67]

Montgomery, B. (see Reid, J.) [26]

Moore, Andrew (Yale)

[104] THE INCEPTION OF POTTING IN WESTERN ASIA AND ITS IMPACT ON ECONOMY AND SOCIETY

The craft of potting began about 8,000 B.P. in Anatolia, the Levant, northern Mesopotamia, and the Zagros Mountains. People in some regions of Southwest Asia had already made gypsum and lime plaster for over a millennium, thus there was a long prior tradition of pyrotechnology. The earliest pottery was used as tableware, for storage of foodstuffs, for cooking, and for holding water. The adoption of pottery for cooking had a significant impact on diet and on contemporary cuisine. In Halaf and Ubaid times pottery manufacture increased in scale, and pots became an object of local and long-distance trade.

Moore, Jerry (California) and Janine Gasco (SUNY-Albany)

[11] DEMOGRAPHIC CONSEQUENCES OF SPANISH COLONIALISM AMONG MOBILE HUNTER-GATHERERS IN BAJA CALIFORNIA DEL NORTE

Within Spanish America, native response to introduced diseases were influenced by indigenous settlement structure, yet most demographic studies have focused on relatively sedentary groups, and little is known about more mobile populations. This study examines pre- and post-contact population and settlement patterns for highly mobile hunters and gatherers from the Pacific coast of Baja California, contrasting these data with information for other new World hunter and gatherer groups. Data from the El Rosario Valley, Baja California del Norte, suggest that the native population, though indirectly affected by European diseases, did not experience demographic collapse until the establishment of Dominican missions in the region.

Moore, K. (see Hiebert, F.) [64]

Moore, M. (see Mainfort, R.) [67]

Morgan, Robert (USDA Forest Service), Gerald Schroedl (Tennessee) and James Bates (USDA)
[2] CHATTOOGA PIT PROJECT: THE ARCHAEOLOGY AND ETHNOHISTORY OF A LOWER CHEROKEE TOWN

The Chattooga Archaeological Project, sponsored by the USDA Forest Service and the University of Tennessee, is a multiyear research effort focusing on the eighteenth century Cherokee town of Chattooga in Oconee County, South Carolina. Work at Chattooga is aimed at describing the chronology of occupation and is intended to produce data for the comparative study of other Lower Town Cherokee villages in the region. The Chattooga excavations are also important for helping to characterize early 18th century Cherokee archaeological assemblages and will also contribute to the understanding of Cherokee culture change in the 18th century.

Morrison, David (Canadian Museum of Civilization) and Charles Arnold (Prince of Wales Northern Heritage)

[19] INUVIALUIT ARCHAEOLOGY IN THE ESKIMO LAKES

Recent archaeological excavations in the western Canadian Arctic have focussed on Inuvialuit (Mackenzie Inuit) sites in the Eskimo Lakes area, a long inland arm of the sea running southwest from Liverpool Bay almost to the Mackenzie River. Although ethnographic information on the area dating before A.D. 1900 is virtually non-existent, archaeological and oral history data suggest the Eskimo Lakes may have played a pivotal role in regional subsistence and exchange patterns over the past 500 years.

Morrison, David (Canadian Museum of Civilization) [Discussant 19]

Morrow, C. (see McCowie, M.) [108]

Morrow, Carol (Southeast Missouri) and Mary McCowie (USDA Forest Service)

[22] LAYERS OF TRAIL SYSTEMS IN THE MIDWESTERN U.S. ARCHAEOLOGICAL, HISTORICAL AND MODERN ENVIRONMENT

Joint research efforts by archaeologists at Southeast Missouri State and the Shawnee National Forest in southern Illinois are focusing on the development of layers of trail systems in the archaeological, historical and modern environment. Such trail systems can begin with animal traces linking salt licks, then be overlaid by Indian trail networks, then by early historic roads, often followed finally by modern state highways. These remnant trails, when not obliterated by modern road construction or farming practices, sometimes can be discerned today, particularly along slopes and ridges. The historic "Trail of Tears" northern route through southern Illinois serves as an example of this sort of recurring land use pattern.

Morrow, Julie (Washington) and Kenneth Tankersly (Illinois)

[106] CLOVIS SITES IN THE AMERICAN BOTTOM

Recent investigations in the American Bottom demonstrate that Clovis sites occur along low gradient streams and modestly dissected uplands. The absence of Clovis sites in the Mississippi River valley is likely related to patterns of Holocene erosion rather than a function of land use. Because of erosion, buried Clovis sites are restricted to uncultivated, narrow upland spurs and terraces along small tributary streams.

Morrow, Toby (Berger Associates)

[99] ARCHAEOLOGICAL TRACES OF CHILDREN'S LEARNING BEHAVIOR: TENTATIVE INTERPRETATIONS FROM THE TWIN DITCH SITE

The manner in which prehistoric children acquired the skills they would use in adulthood presents a challenging issue for archaeological research. This paper draws from the analysis of chipped stone artifacts recovered from the Twin Ditch site, an Early Archaic base camp in west-central Illinois. Within this assemblage are several anomalously reworked bifaces and bifacial tools. Morphological, spatial and refitting data are used to support the interpretation that these artifacts were the by-products of children learning to flintknap.

Morse, Dan (Arkansas)

[0] THE LOWER MISSISSIPPI VALLEY AND CAHOKIA

Down river from Cahokia, Mississippian Period societies (c. AD 750–1650) to a certain extent mirrored contemporary Cahokia societies yet demonstrated an individuality that was not necessarily Cahokia inspired nor did they—as once thought—exert direct influence on Cahokia. Trade to critical resources involved the southern border of Cahokia but probably did not penetrate into or beyond

Cahokia proper with the possible exceptions of around the 12th century and after the "demise" of Cahokia after the 14th century.

Motsinger, Thomas (SWCA)

[107] BENCHES, SHELVES, AND THE PARTITIONING OF VERTICAL SPACE: INTERIOR ELEMENTS OF HOHOKAM ARCHITECTURE AT LOS HORNOS

The structuring of space within Hohokam houses has received remarkably little attention during the recent burgeoning of research in the region. This neglect can be attributed to a lack of expectation, compounded and perpetuated by the employment of abbreviated excavation strategies. During the recent excavations at the Hohokam core village of Los Hornos, a policy of complete structure excavation resulted in the identification of two temporally sensitive patterns of floor holes. These patterns have been interpreted as remnants of raised benches or shelves, and carry implications for interpreting the use of domestic space through the Hohokam cultural sequence.

Mounier, R. Alan

[40] AN ANALYSIS OF TEARDROP-SHAPED BIFACES FROM THE WOODBURY ANNEX SITE, GLOUCESTER COUNTY, NEW JERSEY

Teardrop-shaped bifaces have a wide, but generally sporadic, distribution upon the coastal plains of New Jersey and elsewhere in the Mid-Atlantic region. Until recently, their place in culture history, aboriginal technology, and settlement ecology have remained obscure.

Data recovery excavations at the Woodbury Annex Site yielded more than 700 teardrop bifaces, 20,000 flakes, and related implements. The analysis of this assemblage offers a rare, comprehensive view of teardrop bifaces in terms of production technology, chronology, cultural association, and function. This work reveals the teardrops to be special purpose tools of Late Archaic/Early Woodland age. The analysis traces the trajectories for manufacture, use, and recycling of these implements.

Mudar, Karen (Smithsonian Institution)

[71] SECONDARY STATE FORMATION ON THE CENTRAL PLAIN OF THAILAND

The concept of secondary state formation is examined with respect to the development of complex societies on the Central Plain of Thailand. Evidence from locational analysis of moated sites and historical records are used to examine the development of the Dvaravati Kingdom, which is dated to the 6th-10th C. A.D. Locational analysis of moated sites demonstrate the presence of four or more levels of settlement hierarchy; historical records suggest long-distance trade relations. This data from Southeast Asia is used to address the utility of the concept of secondary states as distinctively different in form and evolution from primary states.

Mulholland, S. (see Prior, C.) [61]

Mulholland, S. (see LeVasseur, A.) [99]

Mulholland, Susan

[72] PHYTOLITH ANALYSIS IN ARCHAEOLOGY AND PALEOECOLOGY

This study addresses two objectives: 1) to test phytolith analysis as applied to detection of maize in archaeological sediments and 2) to evaluate the usefulness of phytolith analysis for interpretation of plant use/discard patterns. Big Hidatsa, a protohistoric site in North Dakota, was studied since maize was documented there. Cultural sediments differed significantly from native prairie, which reflected the modern vegetation. Phytoliths from leaf and husk were rare, probably as a result of the practice of husking in the fields; cob was detected in two sediments. Differences between sediments indicate potential for microstratigraphic analysis.

Mulholland, Susan (Minnesota)

[90] PATTERNS OF PLANT USE/DISCARD: PHYTOLITH EVIDENCE FROM BIG HIDATSA, NORTH DAKOTA

This study addresses two objectives: 1) to test phytolith analysis as applied to detection of maize in archaeological sediments and 2) to evaluate the usefulness of phytolith analysis for interpretation of plant use/discard patterns. Big Hidatsa, a protohistoric site in North Dakota, was studied since maize was documented there. Cultural sediments differed significantly from native prairie, which reflected the modern vegetation. Phytoliths from leaf and husk were rare, probably as a result of the practice of husking in the fields; cob was detected in two sediments. Differences between sediments indicate potential for microstratigraphic analysis.

Muller, Jon (Illinois)

[33] TOWNS ALONG THE LOWER OHIO

The form and structure of Mississippian towns along the Lower Ohio are similar to the two modes of settlement—dispersed communities and "barrier" towns—described in 17th and 18th century

historic documents. These differences in settlement are socially as well as naturally conditioned. These patterns are discussed in terms of implications for Mississippian social life in this region. Of ON

Mulvihill, Timothy (Arkansas Archaeological Survey)

[10] GRAVES #3: AN EMERGENT MISSISSIPPAN SITE IN NORTHEAST ARKANSAS

During the Spring of 1992, a shallow feature was excavated at the Graves #3 site which contained a large number of sherds, several points, and a small amount of deer bone. Ceramics in the undisturbed portion of the feature included both grog and shell tempered sherds, some with the same types of decoration. Initial examination of flotation samples also shows the presence of corn. This site provides new information for the transition into the Mississippian Period in NE Arkansas.

Murray, Matthew (Harvard)

[77] THE RURAL CONTEXT OF REGIONAL CENTERS: LOCAL TRADE AND INTERACTION DURING THE LATE IRON AGE

During the second century B.C., large fortified settlements ("oppida") appeared across the European continent. Their foundation and function varied, but each site reflected important changes in the local rural landscape. Excavations within some fortified settlements suggest that they served as regional foci and interacted with the surrounding countryside in the distribution of craft products, the procurement of raw materials and agricultural surplus, and in ritual practice. Field survey data from Kelheim in southeastern Germany are used to explore the interaction between an "oppidum" and its hinterland, and these data are compared to similar contexts from France to Czechoslovakia.

Mussi, Margherita and Daniela Zampetti (Di Roma "La Sapienza")

[25] CARVING, PAINTING AND ENGRAVING: PROBLEMS IN THE EARLIEST ITALIAN DESIGN

The artistic evidence in Italy, during the Paleolithic, is discontinuous in time, space and technology. While stylistic models, followed all over Europe, are in some instances found, local developments also occurred, mostly in Southern Italy. We tentatively relate this complex pattern to changing demography and evolving social organization, as well as to developments which affected Paleolithic groups outside Italy.

Myers, Thomas (Nebraska State Museum)

[20] EXCHANGE BETWEEN THE ANDES AND THE UPPER AMAZON

Andean societies have a long history of contact with their counterparts of the upper Amazon. A market system in the northern Andes which stretched at least from Ecuador to lower Central America also reached eastern Ecuador and Colombia. Trade foods included live animals, slaves and valuables. Shell money was the medium of exchange. The system included at least one bona fide port of trade linking the highlands and the lowlands.

Nash, David (New Mexico), Anatoly Derevyanko and Mikhail Shun'kov (Institute of Archaeology and Ethnography)

[111] MIDDLE AND UPPER PALEOLITHIC RESEARCH AT DENISOVA CAVE, THE ALTAI, RUSSIA

Denisova Cave, situated in the Anuy River Basin, the Altai, northern Asia, is a large cave containing a long sequence of Mousterian and Upper Paleolithic cultural and faunal material. A multi-phase, joint Russian-American interdisciplinary research program was initiated at the site during the summer of 1992. This paper summarizes prior research at Denisova Cave, preliminary results obtained during the 1992 field season, and future research strategies regarding issues of chronostratigraphy, paleoecological reconstruction, site formation processes, and the nature of the Middle to Upper Paleolithic transition at the site and its relation to other corresponding regional sequences.

Neely, James, William Doolittle and Michael Pool (Texas-Austin)

[100] IS IT, OR ISN'T IT? DISTINGUISHING PREHISTORIC FROM RECENT WATER AND SOIL CONTROL FEATURES IN THE AMERICAN SOUTHWEST

Rock alignments, variously known as check dams, linear borders, terraces, and trincheras, constructed for the control of water flow and its effects on the distribution and displacement of soils have been found throughout the American Southwest. While the probable functions of such features can be determined with little difficulty, the resolution of their antiquity has been much more problematical. Recently constructed rock alignments can be, and have been, easily confused for prehistoric features. This paper identifies 13 morphological characteristics of such alignments that, when no other chronometric evidence is available, may be used to distinguish prehistoric from recently constructed features.

Neff, H. (see Lynott, M.) [47]

Nelson, Margaret (SUNY-Buffalo) [Discussant 34]

Nelson, Sarah (Denver)

[71] HONGSHAN—AN EARLY COMPLEX SOCIETY IN CHINA

Hongshan sites, dated in the fourth millennium BC in northeastern China and Inner Mongolia, have produced a variety of unexpected indications of complex society, including ritual precincts, elaborate burials, and craft specialization. This paper considers the subsistence base, population distribution, and possible trade routes in an effort to understand how and why such a polity arose at this place and time.

Neumann, Loretta (CEHP Incorporated)

[109] FROM CONGRESS TO CONSULTING: ANOTHER VIEW OF THE ARCHAEOLOGIST IN GOVERNMENT RELATIONS

Archaeologists have been active in passing legislation and changing agency attitudes. As a professional staff member for the U.S. House of Representatives for 14 years, the author worked with SAA on issues including the 1980 amendments to the National Historic Preservation Act (NHPA) and 1979 Archaeological Resources Protection Act (ARPA). As a consultant, she has represented archaeologists in the enactment of the 1987 Abandoned Shipwreck Act, the 1988 amendments to ARPA, 1990 Native American Graves Protection and Repatriation Act and 1992 amendments to the NHPA. A "behind the scenes" view of these activities will be detailed.

Neusius, P. (see Neusius, S.) [80]

Neusius, Phillip (Indiana of Pennsylvania)

[80] STONE TOOL DIVERSITY IN IROQUOIAN STUDIES: ARE WE MISSING SOMETHING HERE?

Recent analysis of stone tool diversity at the Late Prehistoric Ripley Site in southwestern New York indicates an unusually restricted range of activities at this site. But an attempt to expand the diversity analysis to other comparable lithic assemblages reveals a surprising lack of quantification in Iroquoian studies that made meaningful comparison impossible. The examination of published reports for Iroquois and related Late Prehistoric sites demonstrates a general lack of concern for lithic studies as a source of information about past behavior. There is a demonstrable need for more intensive studies of Iroquois technologies other than ceramics.

Neusius, Sarah (Indiana of Pennsylvania), Lynne Sullivan (New York State Museum) and Phillip Neusius (Indiana of Pennsylvania)

[80] UNDERSTANDING SITE FUNCTION AT THE RIPLEY SITE

Late prehistoric earthworks in southwestern New York have been assumed to represent defensive fortifications. However, reexamination of older data and newly collected information from the Ripley Site, an earth ring site situated on the bluffs above Lake Erie, suggests that the site is not a simple fortified village and cemetery complex as has been assumed in the literature. It now seems likely that this site had a more complex occupational history possibly involving mortuary ritual. This tentative conclusion leads us to call for a general reevaluation of earthwork sites, settlement patterns and methods of discerning site function.

Newson, Lee (Florida Museum of Natural History)

[79] ARCHAEOBOTANICAL RESEARCH AT THE TRANTS SITE, MONTserrat, WEST INDIES

Archaeobotanical research into prehistoric lifeways on the island of Montserrat, West Indies, has been initiated. Trants, a large Saladoid habitation site, is the current focus of research. Preliminary findings from Trants are discussed in view of the island's ecology and Saladoid adaptation in the Lesser Antilles.

Nicks, Trudy (Royal Ontario Museum) and Tom Hill (Woodland Cultural Centre, Brantford, Ontario)

[86] TURNING THE PAGE: FORGING NEW PARTNERSHIPS BETWEEN MUSEUMS AND FIRST PEOPLES

In 1992 the Canadian Task Force on Museums and First Peoples, which was co-sponsored by the Assembly of First Nations and the Canadian Museums Association, published a report which examined outstanding issues between museums and Native Peoples and made recommendations for resolving these issues within collaborative partnerships. This paper outlines the background to the report and discusses recommendations concerning repatriation, involvement of First Peoples in interpreting their cultures and histories in museums, access to museums for First peoples, and funding for training

Oliver, Jose

and building museums for First Peoples. Progress in implementing the Task Force report will be reviewed briefly.

Nielsen, Axel (Arizona)

[56] SORTING OUT SOURCES OF VARIABILITY IN SETTLEMENT LOCATIONS: A CASE STUDY AMONG PASTORALISTS IN THE SOUTH-CENTRAL ANDES

Locational decisions involve compromises among diverse and often contradictory demands. Limitations of "adaptationist" views, that consider almost exclusively ecological factors, are evident in the common failure of optimization models based on environmental data to predict settlement location. This paper argues that considering social and ideological variables can improve significantly our understanding of the use of space by human societies. This point is illustrated with ethnoarchaeological data from a community of herders and caravan traders in the South-Central Andes. Using GIS technology, a variety of factors that influence the location of residential activities and associated features are explored.

Norr, L. (see Ambrose, L.) [28]

Norr, Lynette (Illinois)

[93] A COASTAL SITE AND A TERRESTRIAL DIET: ISOTOPIC EVIDENCE FROM CERRO MANGOTE, PANAMA

Cerro Mangote is a large, preceramic shell midden and burial site along the Pacific coast of central Panama. The midden (5000-3000BC) contains faunal remains, chipped and ground stone artifacts, shell artifacts, and 85 human burials. The $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ in bone collagen and $\delta^{13}\text{C}$ in bone carbonate suggest a more terrestrially-based high-carbohydrate diet than expected from the site location and midden contents ($\delta^{15}\text{N} = +7.5 \pm .5\%$, n=13; $\delta^{13}\text{C}$ coll = $-13.6 \pm .6\%$, n=14; $\delta^{13}\text{C}$ carb = $-4.5 \pm .8\%$, n=12). These results are consistent with intermittent or seasonal exploitation of coastal resources by a transhumant forager/horticultural population.

O'Brien, Michael (Missouri-Columbia) [Discussant 92]

O'Brien, Michael (Missouri-Columbia)

[47] LATE PERIOD PHASES AND ASSEMBLAGE VARIATION IN SOUTHEAST MISSOURI

Late Mississippian sites in Pemiscot County, Missouri are well known in the archaeological literature of the central Mississippi Valley, primarily because of the ceramic vessels they have produced. Unfortunately, archaeological emphasis has focused on pigeon-holing the remains into phases, the result of which has been a proliferation of spatial-temporal constructs that ignore variation in artifacts among the sites. When Brainerd-Robinson and multidimensional scaling are used to examine similarities and differences in a quantitative manner, the resulting data call into question the usefulness of phases.

O'Brien, P. (see Fenner, G.) [16]

O'Brien, Patricia (Kansas)

[42] THE SOCIOPOLITICAL DYNAMICS OF TRACT 15B

Tract 15B's nine periods of use overlap the Lohmann, Stirling and Moorehead phases. Periods I-III have small houses: a domestic occupation. Periods IV and V have a large circular building: council houses. Period VI has chunky yards while period VII has a bastioned compound: arsenal or market quarter. Periods VIII and IX have large residences reflecting either wealthier people or change to extended families. In the heart of the Stirling phase (IV to VII) the tract has public structures, and being just west of Monks Mound probably are tied to political and public activities associated with the ruling elite.

O'Connell, J. (see Lupo, K.) [7]

O'Shea, John (Michigan) [Discussant 59]

Oliver, Jose (Garrow and Associates)

[60] WHAT HAVE WE ACCOMPLISHED; WHERE ARE WE GOING? TRENDS & PERSPECTIVES IN GREATER ANTILLEAN ARCHAEOLOGY (1970'S-1990'S)

The last two decades of Greater Antillean archaeology have witnessed rapid change both in methodology and research paradigms. Great diversity marks each island as interpretation ranges between the polls of culture historic syntheses and Marxist views. That divergence between the major islands has broadened since the early 1970s as factual results and achievements have accelerated. More researchers have been trained in this previously under-studied region. This paper also assesses the role of governments and the powerful impact that state legislation mandating the mitigation of

archaeological patrimony (i.e., contract/public or state-funded archaeology) has had and will have upon the research trends in the Greater Antilles.

Olivier, Adrian (Lancaster)

[32] FROM RECORD TO CONSERVATION—A REGIONAL PERSPECTIVE

The great majority of archaeological features at a regional and local level are unprotected except insofar as they fall within the planning system, and many landscapes which depend upon traditional land management are now under threat because of changing agricultural patterns. Constraint control and policy advice at regional and county levels needs ready access to archaeological information so that the potential effects of the increasing pressures of development and change may be assessed and then mitigated; adequate mechanisms for the regular monitoring of the consequences of such changes are also necessary. Archaeological survey together with aerial photography provides an efficient and cost-effective means of creating an adequate database for the formulation of appropriate management policies. Modern interactive computer systems enable the convenient analysis of such information, so that the results may be conveyed to, and utilized by, policy makers in a readily assimilable form. The transition from mapping to management is gathering considerable momentum and presents a major challenge to regional and local archaeologists.

Ollendorf, Amy (Minnesota)

[106] PALEOECOLOGY AND CULTURE CHANGE IN THE AMERICAN BOTTOM, USA

New paleoecological data elucidate the landscape history of the American Bottom. A number of stratigraphic techniques, including pollen analysis, loss-on-ignition, paleomagnetics, and radioisotopic dating, were applied to sediment cores from three different contexts across the region. A distinct rise of *Ambrosia* (ragweed) pollen in deep sediments may correlate to an early period of climatic warming, whereas the *Ambrosia* rise in shallow sediments may be attributable to Mississippian and early historic anthropogenic influences. A regional tree-ring chronology was reconstructed to A.D. 1023 to aid in the interpretation of palynological data with particular attention toward the late prehistoric-early historic cultural sequence.

Olson, K. (see Ford, A.) [75]

Orcutt, Janet (National Park Service)

[1] RISK, AGGREGATION, AND SETTLEMENT LOCATION ON THE PAJARITO PLATEAU

Temporal variability in subsistence production (risk) from A.D. 1150-1550 is examined using the Palmer Drought Severity Index (PDSI). Four types of variation in the PDSI have been defined for the northern Rio Grande: 1) low to moderate mean, moderate to high variance; 2) low to moderate mean, low to moderate variance; 3) moderate to high mean, moderate to high variance; and 4) moderate to high mean, low to moderate variance. Types 1 and 2 are expected to encourage settlement mobility, low population density, and little aggregation; types 3 and 4 are expected to encourage higher population density, greater aggregation, and selection of good agricultural locations. Expectations for changes in population and settlement under each climatic regime will be tested using data gathered by the Bandelier Archaeological Survey.

Orosco, W. (see Bauer, W.) [62]

Orr, Heather (Texas-Austin)

[81] THE BALLPLAYERS OF DAINZU: EVIDENCE FOR INTER-SITE ELITE COMPETITION IN THE LATE FORMATIVE VALLEY OF OAXCA

Researchers consider the carved ballplayers at Dainzu to be thematically distinct from the iconography of warfare in Middle-Late Formative sculpture at Monte Alban. The Mesoamerican ballgame was part of a ritual sequence fundamental to political and religious ideology. This ritual pattern included warfare and captive sacrifice. Structural comparison of the Dainzu ballplayers with contemporary materials at Monte Alban and other cultural regions of Mesoamerica reveals that the Dainzu program was an expression of legitimization by a competing local polity. Iconographic evidence of nahuatlism, sacrifice, and dismemberment indicate that the Dainzu sculptures were analogous to the *danzantes* of Monte Alban.

Osborn, Jill, Gordon Peters and Carl Davis (USDA Forest Service)

[2] RESEARCH OR RECREATION? PASSPORT IN TIME

The science of archaeology holds endless fascination for the American Public. In recent years, this interest has been tapped through a variety of highly successful public participation projects, including the Forest Service's Passport in Time program. Despite the fact that public participation in archaeology is at an all time high, professional skepticism remains about the quality of research that can result

from these projects. This paper will show how public involvement has worked in the best interest of heritage resource preservation in the Forest Service.

Osborn, Sannie Kenton (Wisconsin-Milwaukee)

[44] FORT ROSS: A COOPERATIVE EFFORT IN THE INTERPRETATION OF A MULTI-ETHNIC RUSSIAN-AMERICAN COMPANY SETTLEMENT

From 1812-1841, Fort Ross State Historic Park, Sonoma County, California was the site of a small Russian-American Company settlement. This multi-ethnic community included Russians, Creoles, Native Alaskans and Native Californians. Archival research and archeological excavations at the cemetery have provided new information on the colony's social organization. The investigators have worked closely with members of the clergy representing the Orthodox Church as well as the Kodiak Area Native Association in Alaska and the local Kashaya Pomo. It is anticipated that the cemetery will be restored and included in the park's interpretive program.

Oswald, Dana (Prescott)

[103] NATURAL AND SOCIAL AGENTS IN NAVAJO CULTURAL EVOLUTION ON BLACK MESA

Early eighteenth century Navajo visits to Black Mesa in Northeastern Arizona were sporadic and short. In the next three centuries, however, Navajo land use patterns in this region changed dramatically. Ephemeral camp sites gradually gave way to substantial settlements with permanent architectural features as Navajo families came to depend upon the natural resources of Black Mesa for more and more of their subsistence. This paper looks at these changes from the perspective of cultural evolution by focusing on the adaptive responses made by Navajo families to specific circumstances created by environmental and social agents.

Ottole, Andrew and Roger Anyon (Zuni Archaeology Program)

[23] A TRIBAL PERSPECTIVE ON CULTURAL RESOURCE MANAGEMENT CONSULTATION

For tribes, accomplishing cultural resource consultation is neither easy nor simple. At Zuni traditional authority and knowledge is spread among many individuals: No-one person can identify all traditional cultural properties nor assess the effect of a project on these properties. Consultation with all traditional leaders is, however, impractical. Recently the Zuni Tribe developed an innovative system through which consultation is accomplished in ways acceptable to both traditional and elected tribal leaders. This system, and the advantages and disadvantages of consultation itself, are discussed from a tribal perspective.

Otte, M. (see Straus, L.) [64]

Oyelela-Caycedo, Augusto (Pittsburgh)

[60] FROM COLLECTING TO FOOD PRODUCTION IN NORTHERN COLUMBIA

This paper presents an overview of the archaeological results that enlighten the study of the change from collectors to food producers. A reinterpretation of the data is presented as a result of the excavations of San Jacinto I conducted last year and of other recent research at the sites of Puerto Chaco, Monsu and Guajaro.

Oyuela-Caycedo, A. (see Bonzani, R.) [93]

Oyuela-Caycedo, Augusto, Renee Bonzani (Pittsburg) and Jaime Castro (Universidad de Los Andes)

[104] ROCKS VERSUS CLAY: THE EVOLUTION OF POTTERY TECHNOLOGY IN THE CASE OF SAN JACINTO I (COLUMBIA)

The change from lithic to pottery times has been considered as a temporal marker of a major transformation in the evolution of human societies. However, little is known of the meaning of such a change in technology and less is known of the impact that it had, or why pottery was accepted or invented multiple times. In this paper these questions are addressed by analyzing the spatial and functional relationships between lithics and pottery technologies in the case of San Jacinto I. The results help in the understanding of how and why pottery develops by checking some of the models of this process of technological change.

Paine, Richard and David Webster (Penn State)

[37] POPULATION GROWTH IN THE COPAN VALLEY, HONDURAS, AD 400-800

Population levels from AD 400-650 are crucial to reconstructions of Middle Classic Copan political organization. Extensive settlement studies and obsidian dating have yielded good population data for after AD 650. Estimates before AD 650 are more difficult due to depth of deposits and preservation factors (Fash and Sharer 1991; Webster et al. 1992). Copan population growth is projected

backward mathematically from AD 650-800 to AD 400. Projections are compared to previous estimates and their implications discussed.

Parezo, N. (see Fowler, D.) [63]

Parker, K. (see Jacoby, R.) [17]

Parker, Patricia (National Park Service)

[3] SACRED LANDS AND IMPLEMENTATION OF NATIONAL REGISTER BULLETIN 38

As agencies, archaeologists and Native peoples implement "Guidelines for Evaluating and Documenting Traditional Cultural Properties" (National Register Bulletin 38), issues arise that require refinement of the process. Perhaps the most challenging issue arises from the meeting of two worldviews, those of Native Americans and those of archaeologists. Their respective approaches to protection of sacred and traditional lands are fundamentally different. An overview of these issues is based on current and recent consideration of Traditional Cultural Properties.

Parkington, John (Cape Town)

[25] THE SOCIAL CONTEXT OF PAINTING IN THE WESTERN CAPE: SOME RECURRENT IMAGES

Regional archaeologies provide a framework for describing the social context of painting in the western Cape and elsewhere. Motifs with restricted distributions offer a pictorial parallel to the local and regional pulsing of occupation debris and may usefully be viewed against those patterns. Reference in paintings to recognizable social and subsistence events raise the possibility of links between painting, local settlement and demography. Some of these challenging connections are attempted here.

Patino, Diogenes (Temple)

[93] SUBSISTENCE PATTERNS ALONG THE SOUTHERN PACIFIC COAST OF COLUMBIA

Changing subsistence strategies along the south Pacific coast of Colombia are identified by (1) assessing resource availability around coastal settlements of different ages and (2) examining the paleobotanical and paleozoological evidence from site excavations. The southern Pacific coast of Colombia has been occupied from at least 1000 BC onwards. Occupation was most intense during the period between 400 BC and AD 500 by peoples belonging to the Tumaco-La Tolita tradition. During this time period, subsistence activities were focused on the extensive mangrove/estuary systems of the region. Later prehistoric groups did not utilize estuarine resources to any great extent, a pattern which continued past Contact.

Pauketat, Timothy (Oklahoma)

[42] BIG BANG IN THE BOTTOM: POLITICAL CONSOLIDATION AND MISSISSIPPIANISM AT CAHOKIA

Cahokia's appearance as a regional political and economic center around A.D. 1000, recognizable as a series of settlement pattern shifts, may be closely tracked using the refuse and architecture of households at the Cahokia site proper. Significant changes in exotic-good assemblages from sierated deposits at Tract 15A correspond to community restructuring and illustrate that an abrupt and large-scale political transformation occurred in the region. This change is coterminous with or followed by the adoption of certain Mississippian elements. "Mississippianization" may be a manifestation of the symbolic and economic means whereby Cahokia rulers attempted to reproduce regional consolidation.

Payne, Claudine (Florida) and Scarry, John (Kentucky)

[33] TOWN STRUCTURE AT THE EDGE OF THE MISSISSIPPIAN WORLD

In this paper we explore the structure and history of the Lake Jackson site, a Mississippian center located at the periphery of the Mississippian World. Lake Jackson's position allowed it to act as a link or mediator between two disparate cultures—the Mississippian and the Floridian. The forms, functions, and arrangements of mounds and plazas at Lake Jackson, together with its overall material culture and iconographic forms, show that, despite its peripheral location, it was clearly Mississippian town, with little evidence of Florida influence.

Pazos, Miguel and Helaine Silverman (Illinois)

[85] FROM MASTER COLUMN TO CULTURE PROCESS ON THE SOUTH COAST OF PERU

By the time E. P. Lanning published *Peru Before the Incas* in 1967 Peruvian archaeology was heady with the establishment of a fine relative chronology for the south coast that also served as a master column for the rest of the Andean area. Only in the 1980s did archaeologists return to the field to apply the fine relative chronology to broad problems of cultural evolution and reconstruction. Recent fieldwork has concentrated on valley by valley survey for the purpose of delineating settlement

patterns and interpreting culture process from these. Chronological and definitional problems with the master column are now recognized. The current scholars also disagree among themselves on important non-chronological interpretive issues.

Pearsall, Deborah (Missouri)

[85] ADVANCES IN ANDEAN PALEOETHNOBOTANY

At the time of European contact, well developed agricultural systems existed in South America, adapted to the diverse ecological habitats of the continent. Among these were low altitude systems, maintained under irrigation on the Peruvian coast, based on manioc, tree crops, and maize; mid-altitude Andean systems dominated by maize and legumes, and high altitude systems dominated by the potato, minor tubers, and quinoa. Thirty years of paleoethnobotany have resulted in greater understanding of the origin and evolution of these systems. This paper reviews important advances in Andean paleoethnobotany, and suggests directions for future research.

Pearson, Richard (British Columbia) [Discussant 71]

Pedler, D. (see Dirkmaat, D.) [80]

Peebles, Christopher (Indiana) [Discussant 33]

Peebles, Christopher (Indiana) [Discussant 102]

Pendergast, D. (see Graham, E.) [13]

Pendergast, David (Royal Ontario Museum)

[63] "I WONDER WHERE MUSEUMS WOULD BE TODAY . . .": ARCHAEOLOGY AT THE ROYAL ONTARIO MUSEUM, 1913-1993

Like those of many other institutions, the history of the Royal Ontario Museum, Toronto, reflects many changes in the purpose and the methods of archaeological acquisition and exhibition since early in this century. The institution's past also offers a Canadian perspective on issues particular to, and critical to, late twentieth century museum archaeology. This paper uses an overview of the ROM's role in archaeology as a basis for examining the relationship between display goals and the preservation and destruction of human heritage—the lengthy, convoluted, and often frustrating interplay between professional ethics and public service in the museum context.

Pendleton, M. (see Powell, J.) [113]

Pereira, D. (see Brockington, D.) [73]

Pérez-Gollán, José (Universidad de Buenos Aires)

[73] IDEOLOGY AND COMPLEX SOCIETIES IN NORTHERN ARGENTINA

An analysis of the historical role that, both the South Andean ideology and symbolic assets, have had in the shaping and rise of complex societies in Northwest Argentina. This analysis allows a better knowledge of when and how chiefdoms came into being, the way the exchange routes were established, and the importance of some sources, for example: metals and hallucinogens.

Peterkin, Gail (Tulane)

[65] ORGANIC HUNTING TECHNOLOGY IN THE FRENCH UPPER PALEOLITHIC

The application of multivariate analytic techniques to lithic and organic weapon armatures from the French Upper Paleolithic has demonstrated that traditional typological systems are underlain by broad morpho-functional artifact classes which transcend cultural and temporal boundaries. Recent analysis of over 900 bone, antler, and ivory objects from 19 sites suggests that organic weapon types (baguettes, gorges, harpoons, proto-harpoons, sagas, tridents, etc.) form only a few morpho-functional classes. Emphasizing sagas and harpoons, this paper compares results of discriminant analyses with recent typological and experimental research on organic weapon armatures.

Peters, G. (see Osborn, J.) [2]

Peters, G. (see LeVasseur, A.) [99]

Petersen, James (Maine) [6]

Petersen, James (Maine)

[79] TRANTS SITE SPATIAL AND SEDIMENT DATA: IMPLICATIONS FOR SALADOID PERIOD RESEARCH

Ongoing analyses of the prehistoric Amerindian Trants site on Montserrat include spatial distribution and sediment data. Artifact distributions suggest that it is larger than most other Saladoid period sites in the West Indies. The radiocarbon dates, artifacts and stratigraphic associations further suggest

long-term site occupation, ca. 500 B.C.-A.D. 320, or later. Phosphate fractionation and other sediment data confirm the intensity and duration of occupation, and tentatively suggest it had a stable, oval or semi-circular configuration. The implications of these data are significant for Salado research in the West Indies and Lowland South America.

Petruso, K. (see Ellwood, B.) [14]

Phillips, David (SWCA)

[100] INTERPRETING LOW-DENSITY ARTIFACT SCATTERS: AN EXAMPLE FROM SOUTHEAST ARIZONA

Past expectations to the contrary, low-density artifact scatters often contain highly structured information on prehistoric behavior. Using methods developed by Sullivan for the Voigt Mesa site, in 1992 we surface sampled and analyzed over 100,000 artifacts from 7.6 ha in Kartchner Caverns State Park, southeast Arizona. Eight subsite clusters were defined and interpreted in terms of a site use history of at least 3,000 years. The 1992 study confirms the utility of the Voigt Mesa procedures, and provides specific guidance for applying that methodology to CRM contexts.

Pickering, Robert (Denver Museum of Natural History)

[44] INTERPRETING AZTEC AND TAIWANESE CULTURE IN A MULTICULTURAL ENVIRONMENT

Sensitive interpretation of cultural subjects continues to grow in importance to museum anthropologists. Museums that develop cultural exhibits address this issue in each new project. Exhibits that travel to other countries require consideration of a third perspective, the host country's audience. Two recent exhibits pertain. Denver Museum of Natural History with the Templo Mayor Museum of Mexico City recently presented "Aztec: The World of Montezuma." DMNH also will travel "Figures from the Past: The Shaft Tomb Cultures of Ancient West Mexico" to the Natural History Museum of Taiwan. Audience issues include different perspectives on history, ethnic pride, aesthetics and general knowledge of the audience.

Pilgram, T. (see Marshall, F.) [7]

Pilon, Jean-Luc (Canadian Museum of Civilization)

[19] PALAEO-ESKIMO REMAINS FROM THE LOWER MACKENZIE VALLEY, DISTRICT OF MACKENZIE NORTHWEST TERRITORIES, CANADA

To date, evidence of Arctic Small Tool tradition (ASTt) use of the southwest Anderson Plain, an area east of Inuvik, N.W.T., has been found at four localities. While to the east, in the District of Keewatin, a dependence upon caribou led to a southern shift in Pre-Dorset range into the barrenlands about 3500 years ago, data from the Anderson Plain region suggest the maintenance of a coastal-inland seasonal round. Available radiocarbon dates for two of the Anderson Plain sites are roughly contemporaneous with the barrenland movement; 3390 ± 255 (S-3000) and 3470 ± 430 (S-3377) B.P. Assessment of the artifacts found at the Anderson Plain ASTt sites suggests closer links with the contemporaneous ASTt manifestation to the west (Denbigh Flint Complex). Indeed, these few sites may attest to the western extent of the Denbigh Flint Complex range at this time period.

Pinsky, Valerie (Smithsonian Institution) [Discussant 63]

Pintar, Elizabeth (Southern Methodist)

[73] HUNTER-GATHERERS IN NORTHWEST ARGENTINA: NEW PERSPECTIVES ON SUBSISTENCE, SETTLEMENT AND MOBILITY

Northwestern Argentina is an ecologically diverse region which includes the dry, high puna, the deep quebradas dissecting its eastern border, and the adjacent lower valleys. Research within the last decade has yielded evidence of human occupations in these areas throughout the Early to Late Archaic period. As in other parts of the Andes, hunter-gatherer adaptations relied heavily on camelids for their subsistence and utilized mobility patterns which enabled them to exploit dispersed, patchy resources. The various subsistence-settlement models proposed will be discussed and contrasted with other models from neighboring regions in the Andes.

Pitluga, Phyllis (Adler Planetarium)

[12] THE NAZCA LINES AND QUADRANGLES: AN ASTRONOMICAL MODEL

The largest constructions on the Nazca Plains along the south coast of Peru are the quadrangle-shaped plazas (the largest is 800 x 50 meters). Once the relationship of the figures and lines to the Milky Way was determined, then it became apparent that the long axis of each of five plazas was oriented to the rising and setting of the Milky Way at dawn at sowing and harvest times. The proposed model (based upon comprehensive data) is that this site served as a sky-map/observatory to establish an agricultural and ceremonial calendar.

Platt, Elizabeth (Boston)

[57] ECOLOGICAL TRANSFORMATION AT K'AXOB IN THE MIDDLE AND LATE FORMATIVE

Paleoethnobotanical remains from Middle and Late Formative levels at K'axob were recovered and analyzed to provide a more detailed picture of environmental change through time at this site. These data are used to evaluate the effects of different land-use practices upon the local environment at K'axob. In particular, changes in the species composition of the paleoethnobotanical assemblage are useful for investigation of ecological transformations that were a result of developments in Maya agriculture. The analysis also addresses the problem of whether Formative Maya communities transformed or degraded their local environments.

Plog, S. (see Hegmon, M.) [41]

Plog, Stephen (Virginia)

[21] CULTURE CHANGE AND SOCIAL DIFFERENTIATION IN THE AMERICAN SOUTHWEST

Most archaeologists have concluded that the prehistory of the American Southwest was characterized by significant changes in economy, settlement size and distribution, and population density, yet there is considerable disagreement over the degree to which social relations and social differentiation underwent associated transformations. Alternative theoretical perspectives, analytical methods, and interpretations of data that are fundamental to this debate are reviewed and evaluated.

Poeschla, Eric (California)

[57] ANCIENT DNA FROM FORMATIVE MAYA BURIALS AT K'AXOB

Nucleic acids extracted from human bone excavated in 1992 from Formative Period Maya burials at K'axob are being used as template in polymerase chain reactions (PCR) employing primers homologous to human mitochondrial DNA. Extractions and PCR are performed in a containment facility with stringent controls for modern contamination. Amplified PCR fragments of appropriate size corresponding to the targeted segments of the mitochondrial genome are being subjected to restricting enzyme analysis and direct DNA sequencing. This research will allow direct evaluation of genetic affinities within the burial sample and between other ancient and modern populations.

Pohl, Mary (Florida), Kevin Pope (GeoEcoArch) and John Jones (Smithsonian)

[5] INTERPRETATION OF LOWLAND MAYA WETLAND AGRICULTURE: A MULTIDISCIPLINARY APPROACH

The Rio Hondo Project has conducted intensive studies of wetland agriculture in northern Belize, including coring along rivers and swamps and excavating fields at seven different locations. Data on geology, soils (by John Jacob), mollusks, pollen, radiocarbon dating, and artifacts indicate an Archaic presence ca. 2500 B.C. Intensive cultivation, especially of corn, dates to 1000-1400 B.C., with the construction of drainage ditches occurring slightly later in the Preclassic period. The wetland fields were largely abandoned in the Classic period. The modern raised appearance of the fields is a natural phenomenon related to colluviation and a rise in the water table.

Pokines, James (Chicago)

[14] ANTLER AS A RAW MATERIAL: EXPERIMENTATION WITH REPLICATED LOWER MAGDALENIAN SPEARPOINTS

While archaeologists have long analyzed the artistic and typological aspects of Magdalenian antler implements, relatively little effort has been expended upon learning their functional aspects. In order to better understand the applications of antler as a raw material as well as the durability and potential use-life of spearpoints made from it, the author hafted and threw 20 replicated Lower Magdalenian spearpoints at a dead animal target until breakage was induced. The results indicate the incredible durability of antler projectile points and their long use-life, far beyond what one would expect from a stone point.

Polingyouma, E. (see Ferguson, T.) [23]

Pollack, J. (see Coppock, G.) [17]

Pollock, Susan and Melody Pope (SUNY-Binghamton)

[110] TRADE, TOOLS, AND TASKS: THE CHIPPED STONE INDUSTRY FROM AN URUK TOWN

The fourth millennium B.C. is characterized by an apparent increase in interregional interaction between resource-poor alluvial Mesopotamia and surrounding resource-rich zones. Although presumed to be related to growing trade, few detailed interregional studies of the movement of goods have been undertaken. Using data from the Uruk Mound, Abu Salabikh (Iraq) and sites in southwestern

Iran, we examine the movement of cherts used for chipped stone tools, considering raw material sources, the form in which the stone was moved, and uses to which tools were put. We then propose an integrated model linking exchange, production, and use of chipped stone artifacts.

Polzer, Charles (Arizona)

[44] SPANISH MISSION POLICY AND PRACTICE

Inclusion of Spanish colonial mission sites in the National Park system has placed new demands on the interpretation of contact between Spaniards and American Indians. Spanish mission policy was neither monolithic or intentionally oppressive. Shifts in crown goals prior to the secularization of the missions require careful analysis if a sensitive assessment of the mission systems is to be achieved.

Pool, Christopher (Ithaca)

[49] EXCAVATIONS OF LATE FORMATIVE HOUSELOTS AT BEZOAPAN, VERACRUZ

Bezoapan, a small site in the Tuxtla Mountains of southern Veracruz, was occupied from the beginning of the Late Formative period through the Late Classic. The Late Formative component is sealed by a volcanic ashfall. Recent excavations of three stratified Late Formative houselots demonstrate substantial ceramic continuity with both the Middle Formative and Classic periods and test the applicability of Killion's HGRA model of houselot structure to Formative domestic contexts.

Pool, M. (see Neely, J.) [100]

Pool, Michael (Texas-Austin)

[26] ETHNOHISTORY OF PUEBLOAN AGRICULTURE

The ethnohistoric literature for the Spanish contact with the Pueblo Indians is reviewed to develop a picture of the Pueblo agricultural system. Topics reviewed include crops, field descriptions, agricultural activities, tools, and storage. The documentary literature ranges from 1540 to 1630 and covers the expeditions of Coronado, Chamuscado-Rodriguez, Espejo, and de Sosa; documents from the establishment of Onate's colony; and the memorial of Benavides.

Pope, K. (see Pohl, M.) [5]

Pope, M. (see Pollock, S.) [110]

Possehl, Gregory (University Museum-Philadelphia) and Richard Meadow (Harvard)

[78] CLIMATE, COLLAPSE, AND CIVILIZATION IN THE GREATER INDUS REGION

Prof G. Singh's Rajasthan lakes pollen sequence is the primary source for climatological reconstruction for late third millennium Indus Valley. The climate shift documented at ca. 2000 BC has been linked to the collapse of the Harappan civilization. This research is reviewed with regional geological data. The Rajasthan lakes are not dependent upon rainfall. The relationship between climate change and Indus collapse is therefore reexamined from other perspectives.

Potter, Dan (Harvard) [Discussant [94]]

Potter, James (Arizona)

[64] LEVANTINE MOUSTERIAN ASSEMBLAGE VARIABILITY: A VIEW FROM THE WADI EL HASA

A settlement model suggesting increased mobility within the Middle and across the Middle/Upper Paleolithic boundary in the Levant is empirically tested with lithic assemblages derived from sites in the Wadi el Hasa in west-central Jordan. Based upon the test implications put forth, the data is held to be consistent with the model. Earlier assemblages are shown to exhibit signs of "expedition" and the later assemblages show evidence of "curation", a pattern expected with increases in settlement mobility through time.

Powell, Joseph, Michael Pendleton and Gretchen Jones (Texas A&M)

[113] DENTAL WEAR AND DIET OF LATE PALEOINDIAN AND EARLY ARCHAIC POPULATIONS FROM NORTH AMERICA: RESULTS OF SCANNING ELECTRON MICROSCOPY

Scanning electron microscopy (SEM) of the enamel surfaces of the oldest human skeletons in North America documents a pattern of damage typical of Archaic foragers. The maxillary first molars of individuals from Wilson-Leonard, Texas ($9,470 \pm 170$ yr B.P.), Gordon Creek, Colorado ($9,700 \pm 250$ yr B.P.), Whitewater Draw, Arizona ($8,650 \pm 260$ yr B.P.), and Horn Shelter, Texas ($9,500 \pm 200$ yr B.P.) exhibited numerous striations and pits, along with extensive polish. This pattern of enamel damage has been documented for human populations consuming floral resources. Assuming that the observed microwear reflects dietary consumption, these results suggest that some early Holocene

populations in the Plains and American Southwest were engaged in "diffusive" subsistence strategies as early as 9,700 yr B.P.

Powell, Leah and Helen Dockall (Texas A&M)

[28] FOLK NARRATIVES AND ARCHAEOLOGY: CONTRIBUTIONS OF FOLKLORE METHODOLOGY TO THE ANALYSIS AND INTERPRETATION OF AN HISTORIC AFRICAN-AMERICAN CEMETERY

During the widening of State Highway 3 in Galveston County, Texas, a number of historic African-American graves were exposed near the Albert J. Phillips Memorial Cemetery. Although documents indicated that all graves within the highway right-of-way had been exhumed and relocated in 1927, excavation crews recovered 54 burial features that contained a mix of construction debris and fragmentary human remains. The dialogue established between archaeologists and local residents present during the 1927 exhumation yielded narratives crucial to the interpretation of the archaeological assemblage. Folklore methodology was employed to interpret archaeological materials and to integrate the community into the process of archaeological research.

Powell, Mary (Kentucky)

[102] CHRONOLOGICAL TRENDS IN MOUNDVILLE HEALTH

An initial synchronic analysis of elite and nonelite population segments at Moundville indicated only minor differences in adult stature, childhood stress, dental health, and infectious disease experience. This new diachronic reevaluation incorporates changing perceptions of Moundville's history as mortuary center. The expanded seriation of burials by subphase provides a secure pre-Columbian context for the paleopathological differential diagnosis of the New World forms of tuberculosis and endemic treponematoses in this region.

Powers, R. (see Kohler, T.) [1]

Powers, R. (see Hoffecker, J.) [19]

Powers, Robert (National Park Service) and Timothy Kohler (Washington)

[1] POPULATION AND SETTLEMENT AGGREGATION ON THE PAJARITO PLATEAU: THE BANDELIER PROJECT

Bandelier National Monument was established in 1916 to protect a vast array of Anasazi pueblos, cave dwellings, and fieldhouses scattered across the southern Pajarito Plateau. Occupied from A.D. 1100-1600, the park's archaeology encompasses the 13th century Rio Grande Valley population boom, presenting an ideal opportunity to examine the social and ecological contexts of aggregation. Population growth, resource depletion, and competition are presented as key forces in an aggregation model. Based on a 43% sample survey, and excavation of pre- and post-aggregation pueblos, changes in site structure, architecture, settlement, demography, biotic, and artifactual remains are presented and used to challenge the model.

Powers-Jones, Alix (Cambridge)

[61] PHYTOLITHS, DIRT AND DEBRIS: THE DEVELOPMENT OF A "PARALLEL TAXONOMY"

This paper outlines the development of a "parallel taxonomy" of phytoliths. This taxonomy is not based on the classification and identification of individual phytoliths to family or species of plant, but on the matching of assemblages "suites" of phytolith morphotypes to the natural or cultural sources from which they derive. This approach has been successfully used to identify the likely sources of organic waste products recovered from a series of archaeological sites in the outer Hebridean islands off north-west Scotland. The identification of patterns of waste disposal are crucial to the interpretation of plant and land resource utilization. In preservational conditions where carbon-based fossils, such as pollen and seeds, do not survive, phytoliths may be the only available direct evidence of plant use. As yet the identification of organic material is somewhat primitive as much of the background, analogue studies that are necessary to the interpretation, have yet to be performed. The initial work, however, indicates the enormous potential of using this approach to the phytolith analysis.

Powis, Terry (London)

[75] SPECIAL FUNCTION STRUCTURES WITHIN PERIPHERAL GROUPS IN THE BELIZE VALLEY: AN EXAMPLE FROM THE BEDRAN GROUP AT BAKING POT

Excavation at the Bedran Group provide the basis for the functional interpretation of the group's eastern structure. Architectural features, burial practices, and caches are described. The description is used to examine a possible "shrine" function of the structure. Comparative data from the eastern Lowlands is employed to draw tentative conclusions.

Preston, Randall (*Simon Fraser*)

[45] TAPHONOMIC ANALYSIS OF THE SMALL-VERTEBRATE COMPONENT FROM THE CHARLIE LAKE CAVE PALEOINDIAN SITE (HBRF39), NORTHEASTERN BRITISH COLUMBIA, CANADA

Recent investigations at the Charlie Lake Cave site, Peace River District, British Columbia, have yielded, for the first time in Canada, non-human vertebrate remains in direct association with an excavated and radiometrically dated fluted point component. Currently, some 70 vertebrate species, representing all five taxonomic classes, have been identified. Other important characteristics of the faunal assemblage include the predominance and exceptional preservation of terrestrial, small-vertebrate (< 22,000 g body mass) remains throughout the site's 4.5 + meters of deposits. Presented here are the results of a detailed, methodologically exploratory, taphonomic analysis of all identified small-vertebrate remains from 4 of the site's 23 1x1m units.

Price, J. (see Lynott, M.) [47]

Price, T. Douglas

[21] SOCIAL INEQUALITY AND THE ORIGINS OF AGRICULTURE

An argument is made that agriculture and social inequality, two major questions about human prehistory, share common origins. Examination of archaeological data from the Near East and Europe documents the almost simultaneous appearance of status differentiation and the use of domesticates. Focus is on the Levant, the Aegean, and southern Scandinavia. Competing theories for explaining these processes are reviewed and evaluated.

Price, T. Douglas

[72] ADVANCES IN ARCHAEOLOGICAL BONE CHEMISTRY

A number of recent developments in bone chemistry document this area of research as one of high potential and importance for archaeology. Specific attention will be given to both elemental and isotopic investigations that deal with diet, status, and residence. For example, strontium isotopes in bone and teeth are being used to examine changes in residence during the lifetime of an individual. Elemental studies, focusing on strontium and barium in bone, have begun to resolve some of the problems associated with diagenesis. Investigation of diets from other animals using elemental strontium now extends back into the Pliocene. The focus of discussion in this paper will be on recent developments and future directions in these aspects of bone chemistry.

Prior, Christine (*California-Riverside*) and Susan Mulholland (*Minnesota*)

[61] AMS DATING OF PHYTOLITHS: THE BEARSKIN POINT EXAMPLE

Several aceramic sites on the Canadian Shield have yielded PaleoIndian materials in association with charcoal dates that are much younger. Other contexts (pollen cores) or materials (bone), however, have yielded dates that are more reasonable. Dating of occluded carbon in phytoliths was tried on the theory that the opaline silica would protect the carbon from contamination. Minimum dates from fire hearths at the Bearskin Point site in Minnesota are substantially older than the charcoal dates. AMS dating of occluded carbon in phytoliths is a viable alternative dating method.

Procter, Rebecca

[83] ASSESSING DESIGN STRUCTURE IN FRAGMENTARY MATERIALS: METHODOLOGICAL AND THEORETICAL ISSUES IN THE SOUTHWEST

Research near Taos, New Mexico centers on developing a method for identifying levels of design structure in painted potsherds in order to locate patterns that signify closely-interacting pottery making groups. Methodological focus is on fragmentary materials not appropriate for strategies such as symmetry analysis. Results support the hypothesis that some aspects of design are subconscious, subject to behavioral regularities, but less accessible to individual idiosyncratic tendencies that are difficult to analyze archaeologically. Different types of interaction among pottery makers are indicated by differing patterns of similarity in design structure and these relate to larger patterns of social complexity.

Purrrington, Burton (*Missouri*)

[10] PROSPECT SPRING AND THE WOODLAND-MISSISSIPPIAN TRANSITION ON THE PRAIRIE-FOREST EDGE OF THE WESTERN MISSOURI OZARKS

The Woodland-Mississippian transition along the prairie-forest ecotone of Southwest Missouri is not well understood. Prospect Spring is unusual for an open site in this region since this small upland site has never been plowed, cultural deposits are relatively deep, and bone preservation is unusually good. Excavations revealed stylistic and functional changes in lithic artifacts over time. Ceramics and large rock features, suggesting more intensive site utilization, first occur in Mississippian deposits.

However, there is little change in relative frequencies of floral and faunal remains suggesting some temporal continuity in the subsistence role of upland sites.

Pyburn, Anne (*Indiana*)

[5] WHEN A HOUSE IS NOT A HOUSEHOLD: VARIATION AMONG THE ANCIENT MAYA COMMUNITIES OF NORTHERN BELIZE

Recent settlement research in northern Belize documents wide variation in the population density and the distribution patterns of Classic Maya communities. Change over time in the organization of settlement features indicates important social structural developments were concomitant with variable population growth. Environmental data suggest that neither population increase and concentration nor subsistence patterns were always determined by local factors. The problem of interpreting ancient Maya community size, structure, and exploitation strategy as exclusively determined by the local resources and local needs that can be easily identified archaeologically will be addressed with reference to data from both Albion Island and Nohmul.

Quattrini, D. (see Drennan, R.) [21]

Quilter, Jeffery (*Ripon*)

[85] THE CENTRAL COAST OF PERU

The Central Coast of Peru is one of the Andes' most important regions, both due to the volume of research that has been done there and, apparently, due to the role it played in prehispanic times. While the proximity of important archaeological sites to Lima has encouraged research, the intensity and spread of human settlement has destroyed or buried important sites and material. This paper will assess current knowledge of the Central Coast throughout prehistory with special emphasis on the question of its role, at various time, as a center of periphery in cultural dynamics.

Quintanilla, Ifigenia (*National Museum of Costa Rica*)

[93] SUBSISTENCE PATTERNS IN THE SIERPE-TERRABA DELTA, COSTA RICA

Recent investigations performed in two archaeological sites located in the lower basin of Sierpe on the Pacific coast of Costa Rica, revealed the existence of mixed-economy subsistence patterns between 800-1550 AD. Excavations in middens provided samples of organic remains that included bones of mammals, reptiles, amphibia, and mollusks. The analyses performed indicate that groups inhabiting the Sierpe-Terrabs delta, in addition to agriculture, intensely utilized the mollusk banks in mangrove areas, estuary fishing, and hunting small vertebrates.

Ranere, A. (see Hansell, P.) [60]

Ranere, Anthony, Patricia Hansell (*Temple*) and Richard Cooke (*Smithsonian*)

[93] THE USE OF COASTAL RESOURCES IN PREHISTORIC PANAMA

Coastal regions in Panama have quite varied environmental characteristics and settlement histories. Using data on the distribution and abundance of these resources (e.g., fish, mollusks, crabs, terrestrial mammals) in different coastal zones and the record of their use in prehistory, this paper addresses the following questions: (1) to what extent did Panama coastal populations at different times and places exploit the resources present? (2) what were the relationships between coastal and interior regions of Panama over time and space, and (3) to what extend can the settlement-subsistence trajectories found in different coastal areas be explained by the nature and distribution of available resources?

Rattray, Evelyn (*Mexico*)

[97] ARCHAEOLOGICAL IMPLICATIONS FROM THE CONTEMPORARY POTTERS OF EL ROSARIO AND OTZOLOTEPEC, PUEBLA

The similarities in the clay compositions and vessel forms of the contemporary potters and the ancient Teotihuacan-affiliated Thin Orange ceramics provide valuable insights into how the clays were prepared and the techniques of manufacture used. The El Rosario village is located within the region where Thin Orange workshops and source materials were located. The compositions of the clays and temper have been studied by petrographic analyses. The entire process of manufacture employed by the Otzolotepec potters from the collection of clay to firing has been recorded in photographs and video tape.

Ray, Jack (*Missouri*)

[10] EXCAVATION OF AN EARLY ARCHAIC UPLAND RESOURCE EXTRACTION SITE IN SOUTHWEST MISSOURI

In the spring of 1992, investigations were conducted at an upland site located within a proposed highway construction corridor in southwest Missouri. Excavations revealed that although the site contained Archaic, Woodland, Mississippian, and Historic components, only the earliest component

escaped historic disturbances, effectively making the site single component after plowzone removal. Excavations produced the first radiocarbon date from an upland Early Archaic (Jakie) component in the western Ozarks and revealed several unique chipped and ground stone tools associated with a previously unknown Jakie tool kit geared toward the extraction of upland plant and animal resources.

Raymond, J. Scott [Discussant 60]

Raymond, J. Scott (Calgary), Nikolaas van der Merwe (Harvard) and Julia Lee-Thorp (Cape Town)

[93] STAPLE FOODS IN FORMATIVE COASTAL ECUADOR: MAIZE, MANIOC, FISH?

Controversy has surrounded inferences about the food economy of Formative coastal Ecuador. The importance of fishing vs. agriculture, the presence of maize, and the role of manioc have fueled debate. We reconsider some of these issues in light of our analysis of stable carbon and nitrogen isotopes in Formative human skeletal samples, carried out in the context of a control study of the isotopic ecology of the Coastal Ecuadorian region. Results suggest a gradual change in the food economy through out the Formative reflecting an increased reliance on maize and regionally greater importance of sea food. Neither maize nor seafood was dietarily significant during Early Valdivia.

Reanier, R. (See Kunz, M.) [46]

Reanier, Richard (Washington) and Michael Kunz (Bureau of Land Management)

[46] THE PALEOINDIAN PERIOD IN NORTHERN ALASKA

Focusing primarily on newly acquired data from the Mesa site (KIR102), this paper reviews purported northern Alaskan Paleoindian sites. The chronological and typological affinities of these assemblages are reviewed in relation to Paleoindian materials from western Canada and the High Plains. The paleoenvironmental settings of these sites suggest differences in settlement and subsistence systems among the northern and southern manifestations of the Paleoindian period. These comparisons indicate the need for recognition of a Northern Paleoindian period in the cultural chronology of northern Alaska.

Reed, D. (see Whittington, S.) [13]

Reed, L. (see Reed, P.) [103]

Reed, Paul (Navajo Nation Archaeology Dept.) and Lori Reed (Division of Conservation Archaeology)

[103] RE-EXAMINING GOBERNADOR POLYCHROME: TOWARD A NEW UNDERSTANDING OF THE EARLY NAVAJO CHRONOLOGICAL SEQUENCE OF NORTHWESTERN NEW MEXICO

The Gobernador phase of the Navajo occupation of northwestern New Mexico is defined in part by the presence of Gobernador Polychrome ceramics and is dated from ca. A.D. 1680 to A.D. 1800. This ceramic type is generally assumed to have been produced by Pueblo refugees during and after the Pueblo Revolt. New evidence suggests that Gobernador Polychrome was solely a Navajo development and was being produced by the Navajo at least as early as A.D. 1650. Considering the reliance on this ceramic type as a defining characteristic of the Gobernador phase, this new evidence calls into question many of the traditional interpretations concerning the Navajo cultural and chronological sequence.

Reese-Taylor, Kathryn, Francis Meskill and Fred Valdez, Jr. (Texas-Austin)

[95] INNOVATION AND CONTINUITY IN PRECLASSIC CERAMIC PRODUCTION

Developments in production were traced in the Preclassic ceramic assemblage from the site of Kichpanha, northern Belize. An initial petrographic analysis revealed distinct clay and temper resources and technological innovations from the early Middle Preclassic to the Protoclassic periods. Upon integrating the petrographic data with information available on surface treatments and vessel forms, a clear picture of the evolution of ceramic production emerged. The results of this study demonstrated technological and stylistic change for each time period. However, it was also concluded that later ceramic groups were derived from earlier groups, suggesting a strong tradition of continuity as well.

Reeves, Brian (Calgary)

[3] NORTHWESTERN PLAINS SACRED SITES: FEDERAL AGENCIES AND MULTIPLE LAND USE CONFLICTS

The Big Horn Medicine Circle, Chief Mountain and Sweetgrass Hills are among the three most significant Native American sacred places to many of the Native tribes of the Northwestern Plains. Only one, Chief Mountain, lies in part on Indian lands. Part of Chief lies in Glacier National Park,

while the Bighorn is on USFS lands and the Sweetgrass Hills a mixture of private, state and BLM lands. Conflicts exist between continued Native access to these places; agency policies/priorities and multiple land uses—mineral exploitation, timbering and tourism. Each site presents its own unique set of conflicts/problems requiring resolution.

Reher, Charles (Wyoming)

[44] PUBLIC INTERPRETATION ON WESTERN PLAINS ARCHAEOLOGICAL SITES: A COMMENTARY ON NATIVE AMERICAN PERSPECTIVES

The growing Native American involvement in Plains archaeology has led to careful consideration of what constitutes appropriate educational interpretation—a series of issues ranging from relative site sensitivity and conflict resolution to methods for establishing Native American viewpoints as a main part of the interpretation. Specific Wyoming sites discussed are the Medicine Wheel (and associated controversy), rock art sites, stratified campsites, tipi ring sites and buffalo jumps. Opinions offered are based on a background that includes academic research and teaching, directing Anthropology museums, development of public education centers, cultural resource management projects, and working closely with political and traditional religious leaders during 12 years as the Eastern Shoshone/Northern Arapahoe tribal archaeologist.

Reid, Jefferson (Arizona) and Barbara Montgomery

[26] RAPID CHANGE IN FORMAL RITUAL SPACE IN THE GRASSHOPPER REGION, ARIZONA

Ritual space defined by kivas and great kivas did not appear in the Grasshopper Region of eastern Arizona until population aggregation into large pueblo communities around A.D. 1300. Development of formal ritual space from Chodistaas Pueblo (A.D. 1263-1290s) and Grasshopper Spring Pueblo (A.D. 1270s - 1290s) to Grasshopper Pueblo (A.D. 1300-1400) illustrates the conditions under which rapid change in ritual may occur and demonstrates the accessibility of ideological components of past human behavior.

Reinhard, K. (see Sutton, M.) [8]

Reinhard, Karl (Nebraska), Karin Sandness (Smithsonian) and Larry Tieszen (Augustana)

[90] HISTORIC DIETARY PATTERNS IN NORTHEAST NEBRASKA

Isotopic studies were carried out to assess variation in historic and prehistoric Nebraska diet. Collagen-bioapatite ^{13}C spacing values were obtained from ten Ponca and ten prehistoric horticultural skeletons. The prehistoric range of spacing values was 5.0 to 7.4, with a mean of 6.2. For the Ponca, the range was 3.1 to 4.7, with a mean of 3.6. These values indicate greater Ponca meat consumption. These findings are consistent with $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values which also indicate greater reliance on meat and wild plants among historic Omaha in comparison to prehistoric horticulturalists. In comparison of Omaha values with various animal foods and plant foods, it appears that bison was the main animal food consumed by the Omaha and Ponca. Both C4 and C3 plants were incorporated in the diet and a shift away from maize reliance is evident.

Reitz, Elizabeth (Georgia)

[79] VERTEBRATE FAUNA FROM TRANTS, MONTSERRAT

Trants is a Saladoid site located on the island of Montserrat in the Lesser Antilles. Vertebrate remains provide evidence for the use of both terrestrial and marine resources. Terrestrial resources included animals introduced by humans and animals probably driven to extinction by them. Doves and iguana were also used. Fish in the collection suggest use of primarily rocky bottoms rather than offshore waters. These data indicate that the people living at Trants knew very well how to make use of the resources offered by Montserrat and were not unskilled South Americans unfamiliar with living in the Caribbean.

Renken, Lisa (Southern Illinois)

[100] A FUNCTIONAL ANALYSIS OF NECKED VESSELS FROM NORTHERN BLACK MESA, NORTHEASTERN ARIZONA

All functional analyses of prehistoric pottery assume a predictable relationship between the technological and morphological attributes of ceramic vessels and intended use, an assumption supported by many ethnographic studies of pre-industrial potters. Expected attributes for five functional classes of necked vessels are compared to the attributes of three hundred jars and pitchers collected from Anasazi sites in northeastern Arizona. Multivariate analyses are used to identify the morphologically distinct groups of Black Mesa vessels which are then assigned to functional classes. Inferences of vessel function are evaluated against vessel contents, context, and the presence of any identifiable use-marks.

Repp, Andrea (USDA Forest Service-Florida)

[2] THE LANGSTON FARM: RESEARCH MADE POSSIBLE WITH PASSPORT-IN-TIME

The Langston Farm is an archeological and historical site with the only example of rural vernacular architecture in the Apalachicola National Forest, Florida. The site was first settled in the mid 19th century and occupied until the late 1970's. Historical research and preliminary archeological testing began in 1991, done by Forest Service archeologists when time permitted. However, in order to interpret this unique site to the public, much more information was needed. In June 1992, a P-I-T project was undertaken to uncover remains of the original structure, a log cabin built in the 1850's. Project results are detailed in this paper.

Reynolds, Georgeanne (US Army Corps of Engineers-Alaska)

[46] CULTURAL AND ENVIRONMENTAL FORMATION PROCESSES: DISTORTION OF THE ARCHAEOLOGICAL RECORD IN NORTHERN ALASKA

Excavations at the late prehistoric village of Utqiagvik [Barrow], Alaska, gave investigators the opportunity to observe 1) house construction, occupation, and abandonment processes, and 2) environmental site formation processes typical of the Arctic. One house contained the remains of five individuals, killed when it was crushed by ice. The contrast between houses abandoned by their inhabitants and the sudden catastrophe which befell the "Frozen Family" enriches our understanding of both processes as observed in the archaeological record. Documentation of these contrasting contexts provides a means of recognizing distortions in the archaeological record and making sound inferences concerning past life in the Arctic.

Rhodd, Benjamin (State Archaeology Research Center) [Discussant 3]

Rice, Don (Southern Illinois) [Discussant 5]

Rice, Prudence [Discussant 104]

Ricklis, Robert (Coastal Archaeological Research)

[92] CONTINUITY AND ACCULTURATIVE CHANGE ON THE UPPER TEXAS COAST: ARCHAEOLOGY AT THE MITCHELL RIDGE SITE, GALVESTON ISLAND

Investigations at Mitchell Ridge Site (41GV66), conducted by Coastal Archaeological Research, Inc., were required by a Galveston District permit and sponsored by The Woodlands Corporation. Excavations in habitation areas yielded copious aboriginal domestic materials, providing, for the first time, empirical data on the aboriginal economy and human ecology of a Texas barrier island. Several burial groups, ranging from the Late Prehistoric Period to the eighteenth century, reflect the ceremonial dimension of native culture. Specific attributes of prehistoric mortuary practices persisted into historic times. Eighteenth century interments reflect increased emphasis on material wealth and elucidate rapid acculturative changes during colonial times.

Rigaud, Jean-Philippe (Centre National de Préhistoire France)

[25] THE ORIGINS OF SYMBOLIC EXPRESSION AND OF ARTISTIC CREATIVITY: THE ARCHAEOLOGICAL DATA

This paper presents and critically examines the latest archaeological data about the first manifestations of artistic creativity and symbolic expression. Using archaeological data, it considers whether there was artistic expression well before the appearance of mobiliary art.

Rindos, David (Western Australia) and Esme Webb (Western Australia)

[39] MODELING THE HUMAN COLONIZATION OF EMPTY LANDMASSES: THE ADVANTAGES OF OPTIMIZING EXTRACTIVE MALADAPTATION

One of the most hotly debated topics in Australian Archaeology is when and how the continent was first occupied by humans. Two conflicting models have been proposed: that immediately after entry people radiated rapidly to fill the entire continent or that they moved slowly around the coast and up the major river systems, before they were able to occupy the desert. We argue that given the statistical uncertainties inherent in all the currently available chronometric techniques the timing of colonization cannot be determined. We propose an alternative biogeographically coherent model which suggests that extractive maladaptation is the optimal colonizing strategy.

Rippeteau, Bruce (South Carolina Institute of Archaeology) [Discussant 44]

Ritchie, I. (see Huelsbeck, D.) [2]

Ritchie, Ian (USDA Forest Service)

[108] THE STEVENS PASS HISTORIC DISTRICT: AVAILABLE HISTORIC RESOURCES AND POTENTIAL CASE STUDIES IN RAILROAD AND FIRE HISTORY RELATING TO ECOLOGICAL PROCESSES

The 13,000 acre Stevens Pass Historic District encapsulates transcontinental railroad history near the crest of the Cascade Mountains in Washington State. Photos, drawings, records, archaeological

deposits and historical accounts share 100 years of human impacts to the local environment from railroad construction, operation and maintenance. Portions of the railroad were abandoned and can be studied to compare different stages of the local ecosystems adaptation to and reclamation of the railroad path. By scrutinizing and comparing historical records with conditions today we can provide information on plant succession and ecosystem response to impacts over a one-hundred year period.

Rivera, Mario

[20] FROM THE FOREST TO THE PACIFIC COAST, 7000 YEARS AGO: THE CHINCHORRO OF NORTHERN CHILE

The Chinchorro tradition (7800-2500 B.P.) represents the earliest human occupation of the South American Pacific coast at latitudes of 18 to 24 degrees south. Cultural components associated with complicated rituals of mummification provide clues for interpreting their socio-political organization, and constitutes the basis of our hypothesis that migrations from the tropical forest of Amazonia have occurred before the Andean cultural development took place. Additional ecological, climatic, linguistic, and biological evidences are also explored in the formulation of this model.

Rivera, Mario

[73] MARITIME ADAPTATIONS IN THE SOUTH CENTRAL ANDES, ARCHAEOLOGICAL CONTRIBUTIONS

This paper represents an attempt to synthesize the contributions offered by recent archaeological work with respect to maritime adaptations along the Pacific coast, particularly Northern Chile. It includes current views on hunters and gatherers studies and their subsequent adaptation, correlation of cultural traditions and periodification (hunters, gatherers, Chinchorro-Archaic, and Andean), processes of social complexity, including notions on agriculture, sedentariness, urbanization, technological development, and approaches to characterize population entities based on nutritional, genetic, and contamination studies.

Roberts, A. (see Begay, R.) [103]

Roberts, Alexandra (Navajo Nation)

[56] ARCHAEOLOGICAL CORRELATES OF RESTRICTED MOBILITY AMONG NAVAJO FAMILIES IN THE WUPATKI BASIN, ARIZONA

Analysis of the archaeological record produced by two Navajo families over a fifty year period is used to investigate the expectation that occupational intensity in localized places increases as mobility decreases through time. Variability in individual site assemblages is shown to reflect normal short-term fluctuations in residential group size and composition, but in the context of long-term land-use patterns, the cumulative development of homesites and camps in the study area as a whole is the archaeological correlate of increasing occupational intensity as mobility decreases. Implications for scales of analysis in settlement pattern studies are discussed.

Robertson, James and Robert Kingsley (John Milner Associates)

[40] THE LOWER BLACK'S EDY SITE AND PREHISTORIC SETTLEMENT SYSTEMS IN THE MIDDLE DELAWARE VALLEY

The Lower Black's Eddy site (36 BU 23) lies on a level/terrace formation flanking the Delaware River in Bucks County, Pennsylvania. Data recovery excavations were undertaken at the site by Gilbert/Commonwealth, Inc. with data analysis and report preparation undertaken by John Milner Associates, Inc. for the County of Bucks. The excavations identified a stratified cultural sequence spanning the Late/Terminal Archaic, Early/Middle Woodland, and Late Woodland Periods, ca. 2,000 BC-AD 1,500. Close correlations were established between river flow regime, alluviation patterns, and changing patterns of site function and utilization through time. Implications for regional settlement patterning are discussed.

Rocek, Thomas (Delaware)

[41] SEDENTISM AND MOBILITY IN THE SOUTHWEST

Two conflicting views regarding mobility patterns in the Southwest are gaining broad acceptance. On the one hand, there is a fairly wide agreement that many or even most pithouse settlements were occupied seasonally, and there are good grounds for questioning the degree of sedentism of even some pueblo sites. On the other hand, recent research has revealed cases of substantial, perhaps sedentary, occupations extending into the Late Archaic, prior to the widespread appearance of pithouse villages. I examine this variability, as well as the relation between sedentism and the variable generally assumed to be most closely associated with it: subsistence.

Roe, Peter (Delaware)

[60] ADVANCES IN THE STUDY OF LOWLAND SOUTH AMERICAN AND CARIBBEAN ROCK ART

The last 25 years have witnessed both a quantum growth in the documentation of rock art (pictographs, petroglyphs, geoglyphs, etc.) and an increasing methodological and interpretative sophistica-

tion in dealing with this traditionally under-evaluated material cultural resource. While limited in distribution within the alluvial lowlands, where a paucity of stone is common, to the rocky margins (the montaña of the eastern slopes of the Andes), the Brazilian Shield, the Guianan Shield and the Antilles, they exist there in great abundance. Traditional recording, dating and iconographic problems have been addressed with correlations noted with temporal subsistence markers [archaic/horticultural], the rise of social stratification and the movement of iconographic traditions, especially in the Guianas and the Antilles.

Rogers, D. (see Dohm, K.) [82]

Rolett, Barry (Hawaii)

[39] NEW EVIDENCE FOR THE EAST POLYNESIAN HOMELAND: CURRENT RESEARCH IN THE MARQUESAS

Islands within the East Polynesian culture area, including the Marquesas, Society, and Hawaiian archipelagoes, lie at the furthest limits of prehistoric human expansion into the Pacific. The nature of this expansion, beginning around 100 B.C., is a subject of much controversy. Recent research suggests systematic two-way voyaging, beginning with the exploration of East Polynesia and continuing as a network of interaction that linked distant archipelagoes for more than a thousand years. Current excavations of the Ha'atautua coastal dune [Marquesas] yield new data for testing this model, from an exceptionally rich archaeological site within the time period and area of the hypothesized East Polynesian homeland.

Rollins, H. (see Vento, F.) [17]

Roosevelt, Anna (Illinois)

[60] THE ARCHAEOLOGY OF THE LOWER AMAZON: THE LAST 25 YEARS

The past decades have seen momentous events on the lower Amazon as major contesting theories of the nature of the tropical rain forest, and the riverine lowlands that course through it, have led to the testing of long-known archaeological sites using the latest in geophysical methods. This has contributed to changing our understanding of both the antiquity of settled life in Amazonia and the levels of social complexity reached in prehistory. We now have the earliest dated pottery yet recovered in all the Americas from this region, material with formal similarities to complexes as far afield as those on the Caribbean coast of Colombia. Recent concerns for processual cultural reconstruction, gender issues in antiquity, ecological modeling and a renewed interest in the cultural information derivable from complex iconography mark the latest research.

Roosevelt, A. (see de Selveira, M.) [104]

Root, M. (see Ahler, S.) [113]

Root, Matthew (Washington) and Douglas Harro (Washington)

[1] ANASAZI AGGREGATION AND STONE TOOL PRODUCTION ON THE PAJARITO PLATEAU

We test a model of the aggregation of the Pajarito Plateau Anasazi from hamlets into villages using data on stone artifacts gathered during four years of excavation within Bandelier National Monument. The model proposes that increases in population led to wild resource depletion, agricultural intensification, and subsequent aggregation. An increase in regional exchange should also accompany aggregation. Evidence for an increase in the production of obsidian tools for exchange during the Classic period, and decreases in the proportions of hunting tools and increases in the proportions of agricultural implements through time lend some support to the model of Anasazi aggregation.

Rose, M. (see Durand, S.) [35]

Rosen, Arlene (Bengurion University-Israel)

[78] ENVIRONMENTAL AND AGRICULTURAL STRESS: TWO FACTORS IN THE COLLAPSE OF LATE THIRD MILLENNIUM SOCIETIES IN WESTERN PALESTINE

Evidence from geomorphology, palynology, oxygen isotopes, and snail shells indicate a wetter climate during the 4th and 3rd millennia B.C. in Western Palestine. Other evidence from multi-celled phytoliths suggests that the farming systems of the Early Bronze Age were dependent, at least in part, upon irrigated cereals cultivated on aggrading flood plains. An abrupt climatic change at the end of the third millennium led to stream entrenchment, destroying the floodwater farming system. A decrease in rainfall may also have reduced productivity of olives, a primary export product. The changes in water flow regimes may have seriously damaged the agricultural economy.

Rosenfield, Andree (Australia)

[25] IDEATIONAL SHIFTS IN LATE PLEISTOCENE AUSTRALIA

Regional archaeologies provide a framework for describing the social context of painting in the western Cape and elsewhere. Motifs with restricted distributions offer a pictorial parallel to the local

and regional pulsing of occupation debris and may usefully be viewed against those patterns. Reference in paintings to recognizable social and subsistence events raise the possibility of links between painting, local settlement and demography. Some of these challenging connections are attempted here.

Ross, John (Eastern Washington), Jim SiJohn and Robert Sherwood

[3] PROBLEMS OF PROTECTION ON-RESERVATION SACRED SITES: A SPOKAN CASE HISTORY

The present demands by both governmental and tribal agencies to conduct on-reservation ethnogeological cultural resource management surveys, for the purpose of locating, interpreting, and protecting sacred site, has created numerous ethical, and socioeconomic problems amongst the Spokane of the eastern Plateau. This situation is exacerbated by increasing recreational demands and agri-industrial encroachment by white interest groups, Indian factionalism, Indian sovereignty, differential legal interpretations, treaty rights, and cross-cultural variance of land use and perceptions of Indian sacredness. This paper will identify and discuss these problems and certain efforts to resolve intergroup conflict.

Rosser, Jack (Middlebury)

[12] PLANT REMAINS OF NANCHOC, NORTHERN PERU: EARLY CULTIGENS OR MODERN INTRUSIONS?

A suite of plants, including squash, peanuts and manioc, was recovered from Middle Preceramic (ca. 8000-7500 BP) habitation sites near Nanchoc, northern Peru. The collection potentially represents some of the earliest evidence of cultigens recovered in South America. A reasonable assessment of these remains requires consideration of several lines of evidence, including (1) site integrity and contexts, (2) plant taphonomy, (3) plant morphologies, and (4) associated dates (both standard and AMS). The discussion highlights issues that are central to evaluating all reputedly early plant collections.

Rossignol, Jacqueline (New Mexico)

[56] THE ECOLOGY OF AGRO-PASTORALISM, SOILS, AND THE ARCHAEOLOGICAL RECORD

Ecological theory provides a potential way to link observable present day dynamics underlying contemporary agro-pastoral societies with farming and herding systems of the past. Most ecological applications (e.g. seasonality) are site based: another way to give ecological theory archaeological relevance is to address the landscape scale common to both disciplines. This paper compares diversity in soil type with both diversity in Zuni agro-pastoral strategies and trends in land enclosure utilizing a landscape ecology approach. Implications for the use of the method for interpreting the archaeological record are discussed.

Rostoker, A. (see DeBoer, W.) [60]

Roth, Barbara (Pima)

[100] LATE ARCHAIC LITHIC PROCUREMENT STRATEGIES IN THE TUCSON BASIN

This paper uses evidence from excavated Late Archaic sites in two environmental zones, the floodplain and mountain foothills, to examine lithic procurement strategies. The differential use of raw materials in these two zones is documented. Possible reasons for these differences, including variation in raw material availability and accessibility, are investigated. The relationship between raw material procurement and general subsistence practices in the Late Archaic is also addressed.

Rovner, Irwin (North Carolina)

[61] GETTING DOWN TO SPECIFICS: PHYTOLITH ANALYSIS IN HISTORIC PERIOD SITES

The tendency of phytolith taphonomy to provide decay-in-place residues has been noted in both prehistoric and historic period contexts. However, historic period sites are well configured to take advantage of this phenomenon. Under US Park Service support, phytolith analysis was employed on sedimentary sequences from 19th century residential yards at Harper's Ferry, WV. In addition to reflecting general trends in floral and landscaping patterns evidence was particularly effective in identifying little known and unknown activities of short duration, often by individual residents, affecting the botanical fabric of the specific locations tested.

Rue, D. (see Bergman, C.) [40]

Ruffing, Lorraine (United Nations)

[3] TRANSNATIONAL CORPORATIONS AND INDIGENOUS PEOPLES: A VIEW FROM THE UNITED NATIONS

A sub-committee of the United Nations has focused attention on improving the effectiveness of indigenous participation in decision-making regarding actions of transnational corporations. A num-

ber of case studies are reviewed, including North American examples. These studies show that projects planned and implemented in cooperation with indigenous peoples reportedly involved fewer adverse impacts and more benefits for the indigenous peoples in question, while at the same time being more cost effective to the corporations.

Russell, Glenn (CSULB)

[12] EXCAVATIONS AT CERRO MAYAL: A MOCHE IV CERAMIC PRODUCTION WORKSHOP IN THE CHICAMA VALLEY, PERU

The Cerro Mayal Project is designed to investigate technology, labor organization, and exchange at Cerro Mayal, a Moche IV (AD 400-550) specialized ceramic production workshop. Results from the first session of excavations provide valuable information on the nature of technology including firing facilities and mold use. The spatial distribution of features and production waste indicates discrete areas for different stages of ceramic production. Based on these and other data the workshop appears to have been primarily independent, probably staffed by full-time specialists.

Saidel, Benjamin (Harvard)

[110] PASTORALISTS AND NOMADIC PASTORALISTS- THE INVISIBLE AGENTS OF SOCIAL AND ECONOMIC CHANGE

Pastoralism is often used in the archaeological literature in models of changes in material culture, social organization, and as agents for exchange between Egypt and the southern Levant. It is argued that this broad use of "pastoralism," tends to confuse rather than clarify scenarios reconstructed by various archaeologists. In this light a new model is advanced for interpreting pastoral sites and assessing the importance of this economic strategy in the fourth and third millennia B.C..

Sampeck, K. (see Fowler, W.) [13]

Sanchez, Julia (California-Los Angeles)

[100] A NEW MODEL OF MIMBRES FAUNAL SUBSISTENCE

The previously accepted model of Mimbres faunal subsistence was that increased agriculture affected the environment, and jackrabbit populations increased while cottontail and artiodactyl populations decreased. New data from the NAN Ruin and Old Town and a re-examination of previously published material showed that throughout the Mimbres region the prehistoric population relied primarily on rabbits, and also on rodents and artiodactyls. This pattern was not affected by temporal changes, but spatial differences occurred.

Sandefur, Elsie and Robert Daniels (UCLA)

[105] COMPARISON OF FAUNAL REMAINS FROM INKA AND SANTA MORIANA SITES IN THE CALCHAQUI VALLEY

Analysis of over 27,000 animal bone fragments from the Inka site of Potrero de Payogasta and the Santamariana site of Valdez indicate that a variety of species was consumed at each settlement. At both sites, large camelids dominated, with a higher proportion of these animals found at the Inka center. Bone measurements suggest that camelids bred for transportation and wool dominated the assemblage at Valdez, whereas meat use was more important at Potrero. A higher percentage of bone modified through cutting and burning was also recovered from the Inka center.

Sanders, William (Pennsylvania)

[88] EVOLUTION AND DIFFUSION IN PREHISPANIC MESOAMERICA

The first Spanish encounters with the native peoples of Mexico fired the imagination and challenged the conceptions of the world of the literate class of European societies. European scholars were struck with both the similarities and differences between the native civilizations and their own. Explanations of these questions since then and even into the twentieth century have generally revolved around what may be called the diffusion-evolution controversy-the paper discusses the findings of modern archeological science and cultural anthropological theory with respect to this controversy.

Sandness, K. (see Reinhard, K.) [90]

Sandweiss, Daniel (Maine)

[48] HIDE OR GO SEE: CHANGE AND CONTINUITY IN THE LAMBAYEQUE VALLEY BURIAL TRADITION

The elite burial tradition for the Lambayeque Valley during the Early Intermediate Period and Middle Horizon involves deep burial of the bodies and grave goods under solid fill: the dead were not meant to be seen again. Tucume provides evidence for a change in this pattern during the Late Intermediate Period: an elite burial structure has been found in which the dead apparently remained accessible after interment. Through time, the constructions surrounding this "tomb" became increasingly elaborate until, after the Inca conquest of the site, the contents of the tomb were removed and

a different structure built on top. The implications of this shift are considered in a wider, Andean context.

Santley, Robert (New Mexico) and Philip Arnold III (Loyola)

[49] FORMATIVE PERIOD SETTLEMENT PATTERNS IN THE TUXTLAS MOUNTAINS, VERACRUZ, MEXICO

This paper discusses the results of recent research on the Formative Period conducted in the Tuxtla Mountains of southern Veracruz, Mexico. A distinct settlement hierarchy was present in the region by Middle Formative times. Growth occurred throughout the period, but there were also major shifts in settlement pattern, intensity of occupation, and material technology. Occupation at all sites was dispersed, even at large settlements. Little evidence of occupational specialization was recovered from the sites.

Santone, Lenore (Texas-Austin)

[53] INTRAREGIONAL EXCHANGE SYSTEMS: THE ANCIENT MAYA LITHIC ECONOMY OF NORTHERN BELIZE

Focusing on the exchange of Colha-produced chert implements in northern Belize during the Late Classic and Early Postclassic periods, this paper will summarize the results of a study which develops a model of intraregional exchange based on demand structure and transportation costs. The research to be described in this paper is concerned primarily with intraregional exchange of a utilitarian commodity, however the distribution of Colha-produced ceremonial lithics should provide information on interregional trading systems.

Santoro, Galogero (Pittsburgh)

[73] COMPLEX SOCIETIES IN THE PACIFIC VALLEYS OF THE SOUTH CENTRAL ANDES

Archaeological analysis of the development of social complexity in the western valleys of extreme southern Peru and extreme northern Chile has been influenced strongly by interpretive models derived from ethnohistory. For instance, the findings of ethnobotanical, architectural, settlement pattern, and other studies are often evaluated in the light of ethnohistorical data and models. Selected models of cultural adaptation and evolution are reviewed critically in terms of their contribution to our understanding of late prehispanic social organization in the circum-Titicaca region. To date, the formulation of regional models of social organization have focused on the more archaeologically conspicuous and politically powerful societies and their relations to hinterland populations whose own cultural history is assumed and understood only in the context of the dominant society. Review of literature and models show that local populations in the northern sector of the south-central Andes, whether at or below the state level of organization, developed different social strategies for interacting with a wide variety of ethnic groups and ecological zones.

Sassaman, Kenneth (South Carolina Institute of Archaeology)

[104] THE SOCIAL CONTRADICTIONS OF TRADITIONAL AND INNOVATIVE COOKING TECHNOLOGY IN THE AMERICAN SOUTHEAST

The earliest pottery in North America emerged in the midst of a soapstone cooking technology that was central to the establishment and maintenance of exchange alliances in the Savannah River Valley. The new technology, along with innovations to improve thermal efficiency, were slowly adopted by groups that produced soapstone tools. Stylistic innovations and alternative alliances arose to offset the social contradictions imposed by such resistance. Eventually, the widespread use of pottery contributed to a strategy of fissioning that undermined soapstone trading networks. Patterns to these sociopolitical processes are evident in the local and regional records of early ceramic vessels.

Sather, Dean (Kansas)

[113] GEOARCHAEOLOGY OF THE NORTON PALEOINDIAN BONEBED IN STRATIGRAPHIC HISTORY AND ASSEMBLAGE DEFINITION

The Norton Bonebed represents a faunal assemblage underlying two to four meters of deposit. Since bone and lithic material occur on the floor and in the fill of an ancient gully one or more periods of deposition may be represented. This site provides the first opportunity for controlled investigation of the depositional history and post-depositional processes of an early Holocene bonebed in the region. Results of the taphonomic analysis and lithic and sediment studies are useful in evaluating multiple models of site formation as well as in defining archaeological assemblages.

Saunders, Joe (Louisiana) and Thurman Allen (Soil Conservation Service)

[67] FRENCHMAN'S BEND: AN ARCHAIC MOUND COMPLEX IN NORTHEAST LOUISIANA

Recent research in northeast Louisiana suggests the existence of an Archaic mound building tradition which dates to 4000 B.C. Excavations in Mound C at Frenchman's Bend recovered charcoal samples from two hearths. The first hearth is beneath the mound and dates to a calibrated age of

4,581?230 B.C. (Beta 55359). The second hearth is in the mound fill and dates to a calibrated age of 4,360?140 B.C. (Beta 55358). A review of existing information on Archaic mound sites in Louisiana (>2000 B.C.) will be presented, followed by an overview of the excavations, artifacts, and features at Frenchman's Bend.

Savage, Howard (Toronto)

[18] PRE-CLOVIS DATED HUMAN HAIRS

A human hair was identified as such for the author through the kind services of A. A. Tessorolo at the Centre of Forensic Science, Toronto. It was found embedded in calcrete (zone E, carbon-dated from adjacent charcoal 19,000 BP) and, therefore, could not possibly be of a later date. It was described as typically human, as to cuticle scales, cortical pigmentation, and medullary structure, and probably a body hair rather than a scalp hair. Recent AFAR cross-sections favor mongoloid ethnicity. Several other hairs from zones C-D (15,000 to 17,000 BP) have been partially studied and have some distinctly human characteristics. If this trend continues, DNA analysis and carbon-dating will be done.

Savelle, James (McGill)

[89] A TAPHONOMIC INVESTIGATION OF MASS BELUGA WHALE KILLS, ARCTIC CANADA

The skeletal remains of approximately 420 beluga whales (*Delphinapterus leucus*) resulting from several nineteenth century mass kills by European whalers were recorded at Elwin Bay, Somerset Island, Arctic Canada during the 1992 field season. Because these animals were flensed for skin and blubber only, and then set adrift, their remains are in an ideal context for the study of taphonomic processes affecting large marine mammals. This paper describes preliminary analyses of the relationship between natural coastal processes, and patterns of grounding, size sorting, and disarticulation.

Scaglion, Richard (Pittsburgh) and David Watters (Carnegie Museum of Natural History)

[79] BEADS AND PENDANTS FROM TRANTS: DESCRIPTIVE STATISTICS AND SOUTH AMERICAN CONNECTIONS

This paper examines a surface collection of 503 beads, pendants, and related objects from the Trants site. Of these artifacts, 389 are finished objects, including 360 regular rounded beads, 17 faceted beads, and 12 pendants. Other stages of manufacture (including raw materials and blanks) are also represented. Preliminary results suggest that diorite beads were probably obtained from off-island; carnelian beads, although exotic, were probably manufactured locally; and "jadeite," "green-stone," and turquoise beads, probably sourced to South America, may suggest broader cultural connections.

Scarborough, Vernon (Cincinnati)

[5] RESERVOIR DEPENDENCY AND WATERSHED LANDSCAPING: WATER MANAGEMENT IN THE SOUTHERN MAYA LOWLANDS

Water management practices and scale allow one approach to the causal factors resulting in state formation. Nevertheless, water management in semitropical and tropical settings has not received the same consideration that it has in more arid and semiarid environments. Unlike the sustained canal or distributional water systems found in arid, riverine-dependent primary states, the Maya maintained an extremely flexible, reservoir-dependent, water manipulation system. This paper will examine how site-specific micro-watersheds helped shape Maya landscape and the scale and complexity of their society.

Scarry, J. (See Payne, C.) [33]

Scarry, Margaret (Kentucky)

[102] EXAMINING THE MUNDANE: DOMESTIC LIFE AT MOUNDVILLE

Moundville was the paramount center of one of the largest Mississippian polities in the southeastern United States. Not surprisingly, our depictions of Moundville tend to emphasize glamorous political, economic, and ritual activities. Considerably less has been said about mundane domestic activities. Recent excavations on the riverbank on the northwest edge of Moundville uncovered residential deposits dating to the Moundville I phase (AD 1050-1250). For this paper, I combine data from the riverbank with information from earlier.

Schaafsma, Curtis (Museum of New Mexico)

[103] THE PIEDRA LUMBRÉ PHASE AND THE ORIGIN OF THE NAVAJO

In 1981 I presented a model of Navajo origins, consistent with Wilcox's Querecho Model which stated that the Navajo are best understood as a late (ca. 1580) arriving band of High Plains Apaches who settled in the Chama Valley of New Mexico and did not move west of the Continental Divide until after the 1696 Revolt. This model must be evaluated in the light of new archaeological data

from the northern San Juan Basin, some of which may be early Ute and some of which may be improperly dated. Valid data will require changes in the model.

Schaeffer, Jerry (Brian Mooney Assoc.)

[58] THE PREHISTORY OF THE COLORADO DESERT: RECENT APPROACHES AND DISCOVERIES

Hunter-gatherer adaptations to one of the most arid portions of the southwestern deserts have been the subject of extensive archaeological investigations over the last fifteen years. Several key research issues have been substantially resolved or brought into clearer focus. Among the issues to be discussed are the resolution of alleged pre-Paleoindian dates, excavations of rare Archaic Period stratified sites, and evidence for the diversity of adaptive patterns and chronology of occupation during the successive infillings and final desiccation of Lake Cahuilla.

Schamel, Kathleen (CEHP Incorporated)

[109] THE POLITICAL KOOLA RING: AN HISTORICAL OVERVIEW OF THE SAA IN GOVERNMENT RELATIONS

Over the last 20 years, the SAA has become increasingly influential within the political arena. Archaeologists have become important sources of knowledge and expertise at all levels of government. Politicians now rely on archaeologists in efforts to protect the past. Archaeologists, in turn, have gained better legal tools to identify and preserve sites, increase public understanding of cultural resources and generally improve the management of prehistoric and historic resources. A brief history of SAA's role in the political process and an overview of some cultural resource protection legislation will be provided.

Schelberg, John (US Army Corps of Engineers)

[44] ETHNICITY AND LAND USE IN THE CHAMA VALLEY

Determining the cultural affiliation of archaeological sites is a recurring goal in north-central New Mexico. In conjunction with an Army Corps of Engineers water development project involving 47 sites at Abiquiu Reservoir, an integrated archaeological, archival, and oral history approach was used to delineate use of the Chama Valley by rural populations. Emphasis was placed on defining ethnicity, land-use practices, and relationships to the Spanish, Mexican, and United States governments. The results provide a greater understanding of the area's cultural events than would have been obtained from either a strictly archaeological or ethnographic approach.

Schiffer, M. (see Skibo, J.) [28]

Schjellerup, Inge (National Museum of Denmark)

[20] EXPANSION OF THE INCA EMPIRE INTO THE CHACHAPOYAS REGION OF NORTHEASTERN PERU

This paper focuses on the political penetration of the Inca state into a remote region of the Eastern Andes in northeastern Peru. Archaeological evidence of this expansion is derived from pottery, buildings of dressed stone masonry, terraces, and warehouses found at Cochamarca, Atuen, Papmarca, and other sites located in the District of Chuquibamba. This evidence supports a substantial socio-political incursion by the Inca into the eastern margins of the Andes in this region, extending perhaps as far as the Maranon.

Schmitt, Dave (Dames & Moore)

[45] GREAT BASIN TAPHONOMY, HUMAN SUBSISTENCE, AND TAXONOMIC DIVERSITY: A VIEW FROM ROCK SHELTER, SOUTHWESTERN UTAH

Analysis of over 10,000 faunal specimens retrieved from Rock Shelter identified at least 32 taxa. Detailed analysis of skeletal attrition found the assemblage to contain a mixture of natural accumulations and human subsistence debris. Presented are some of the criteria employed in differentiating between natural and cultural bones, particularly with respect to small mammal accumulations. By teasing out the non-cultural bone and examining taxonomic diversity of the subsistence refuse versus the entire site assemblage, a vastly different image of human subsistence comes into view. These data then are used to re-examine recent studies on variability in Fremont and Fremont-late prehistoric subsistence patterns.

Schnieder, Fred (North Dakota)

[90] NATIVE AMERICAN GARDENING IN THE NORTHEASTERN PLAINS: EXPERIMENTS AND OBSERVATIONS

Ten years of experiments with Plains Village gardening methods using "traditional" seeds include: replications of a Hidatsa garden, observations of plant growth, comparisons of hillside versus row-planted maize, observations of interplanting of maize and beans, observations of maize susceptibility

to corn borers, preliminary estimates of yield, experiments in squash drying, cache pit construction and seed preservation, and consumption. Cultigens have included: maize, beans, squash, melon, sunflowers, and tobacco. Native seeds and gardening methods are demonstrated to be successful in eastern North Dakota.

Schoenberg, Kenneth (National Park Service-Alaska)

[46] THE POST-PALEOARCTIC INTERVAL IN THE CENTRAL BROOKS RANGE

This paper attempts to answer the question of what was happening in the Brooks Range during the apparent 2000 year interval between the Paleoarctic and Northern Archaic traditions, both of which have been defined on the basis of differing lithic technologies. A review of the defining characteristics of both traditions is undertaken and local variants are discussed. A model of the culture history suggests that the Central Brooks Range was continuously occupied at this time period.

Schoeninger, Margaret (Wisconsin-Madison), Mark Schurr (Notre Dame), and Lane Beck (Harvard)

[102] HUMAN SUBSISTENCE AT MOUNDVILLE: THE STABLE ISOTOPE DATA

Stable carbon and nitrogen isotope analyses of approximately 250 human, animal, and maize samples indicate changes in human subsistence strategies during occupation at pre-Contact Moundville in Alabama. Data suggest increased maize use between Moundville I and the subsequent Moundville II Phase. Most importantly a decrease in $\delta^{13}\text{C}$ values between Moundville III and the subsequent Alabama River Phase ($t = 2.96$, $df = 53$, significant at the 0.01 level, two-tailed test) coupled with a lack of change in $\delta^{15}\text{N}$ values suggests a decrease in dependence on maize and an increased dependence on gathered plant foods. This supports earlier hypotheses associating Moundville's collapse with diminished productivity of its agricultural lands.

Schreiber, Katharina (California-Santa Barbara)

[62] STRATEGIES OF INKA CONTROL IN THE NASCA REGION OF PERU

It has been more than 30 years since Menzel published her summary of the Inka occupation of the south coast of Peru, based on historic documents and extant archaeological data. Recent archaeological research in the Nasca region provides new information on the nature of local political centralization at the time of the Inka conquest, and sheds new light on the strategies employed to consolidate the region under Inka imperial control. Of special interest is the Inka site of Paredones (Caxamarca), whose elaborate architecture is more typical of the Cuzco region. Why was Nasca so special to the Inkas, and why did they invest so much in the region?

Schroedl, G. (see Morgan, R.) [2]

Schroedl, Gerald (Tennessee)

[33] MISSISSIPPIAN TOWNS IN THE EASTERN TENNESSEE VALLEY

The archaeological record of Mississippian towns dating between A.D. 1000 and A.D. 1600 is characterized by three major dimensions: (1) There is increased nucleation over time, with increasingly well-defined town planning, (2) Individual towns show periodic fluctuations in the size of resident populations, and (3) There are episodic patterns of town abandonment some of which are surely related to reduced crop yields and declining availability of local resources. There are accompanying changes in economic strategies resulting in greater task specific organization of labor. Patterns of social and ceremonial interaction and competition among groups are important to describing this variability.

Schuldenrein, Joseph (Geoarchaeology Research Associates)

[40] THE GEOMORPHIC BACKGROUND TO PREHISTORIC OCCUPATION OF THE CENTRAL DELAWARE VALLEY

Ten years of inter-disciplinary research have produced comprehensive reconstructions of the prehistoric landscapes of the central Delaware Valley. These are based on site specific geomorphic research associated with large CRM projects. The present study is an attempt to synthesize individual site landform and soil formation observations into a regional model for landscape change and utilization. It is based on several stratified sites from the floodplain and terraces of the trunk stream (Delaware River) bolstered by sequences from tributary streams and diagnostic microenvironments. There are striking parallels in long-term paleo-geomorphic trends that are punctuated by short-term local landscape changes. It is possible to infer broad relationships between evolving floodplain environments and settlement proclivities since Early Archaic times.

Schurr, M. (see Schoeninger, M.) [102]

Schwarz, H. (see White, C.) [37]

Scott, Elizabeth (Mackinac State Historic Parks)

[80] AN IROQUOIS SPRING FISHING CAMPSITE: THE FAUNAL EVIDENCE FROM A LATE PRE-CONTACT SITE IN WESTERN NEW YORK

This paper presents an analysis of the faunal remains from the Spaulding Lake site (UB 2497), a single-component Iroquois campsite occupied c. AD 1450-1550, located in western New York on the Onondaga Escarpment. Excellent preservation conditions allowed the recovery of a much greater quantity of faunal remains than is common for sites in the area. The assemblage thus provides a unique opportunity to address questions about subsistence activities, resource exploitation, and refuse disposal at a late pre-contact Iroquois site.

Scuilli, Paul and Myra Giesen (Ohio State)

[91] STATURE OF THE MADISONVILLE POPULATION IN EVOLUTIONARY AND ECOLOGICAL CONTEXT

Native American populations of the Ohio area, ranging in time from the Late Archaic to Protohistoric periods, expressed the same pattern of variation for the components of stature. While these bodily proportions ("shape") were constant through time and across ecological zones, stature ("size") varied significantly. The Madisonville population can be characterized as one of the shortest ever present in Ohio, with male ($n=77$) stature averaging 160.6 cm (5'3") and female ($n=95$) stature averaging 151.2 cm (5'0"). Nutritional stress in this population is seen as a causal factor. This proposition is examined in light of proposed dietary reconstructions and observed ecological differences in Ohio populations.

Scullin, Michael (Mankato)

[90] CLIMATIC FACTORS AND CORN-YIELD IN THE NORTHERN PLAINS

Extreme climatic variability is one of the most significant limiting factors for all life on the Northern Great Plains. Humans have developed strategies which have enabled some cultures to exceed ecosystemic limits for varying lengths of time. The Plains Village horticultural system was one such strategy. Estimates of the productivity and reliability of this system are quite crude. Data from the North Dakota Agricultural Experiment Stations in the late 19th and early 20th centuries and some dendroclimatological studies can be very useful to those attempting to reconstruct subsistence patterns. Degree-days and precipitation patterns must be considered together.

Sebastian, Lynne (New Mexico SHPD)

[23] TRADITIONAL CULTURAL PROPERTIES AND THE SECTION 106 PROCESS

Traditional cultural properties are historic properties, eligible to the National Register, that are important in maintaining the continuing cultural identity of a traditional community. Often knowledge of these sites is preserved only in oral traditions, and many can be identified only through interviews and field visits with knowledgeable people from the traditional community. Most often, responsibility for identifying and trying to preserve these properties through the Section 106 process rests with archaeologists, even though most of us have little formal training in ethnographic methods. This paper offers some definitions and practical advice for those who are new to this challenging but rewarding process.

Sellet, Frederic (Southern Methodist)

[113] A DYNAMIC VIEW ON PALEOINDIAN LITHIC ASSEMBLAGES AT THE HELL GAP SITE, WYOMING: RECONSTRUCTING LITHIC TECHNOLOGICAL SYSTEMS

This paper evaluates organizational variability within several Paleoindian lithic assemblages at the Hell Gap site, Wyoming. The wealth of technological information at this site is unique in the Paleoindian record, and although the site was excavated in the early 60's, this information has remained unexploited for the last thirty years.

A technological analysis of the data uses the concept of an operating chain. This methodology maps out the strategies surrounding raw material procurement, tool production, tool use and discard. This allows an unprecedented diachronic comparison of Paleoindian lithic systems. The structural differences between the systems are outlined and the role of mobility in shaping them are addressed.

Selvaggio, M. (see Bishop, J.) [51]

Senior, Louise (Arizona) and Barbara Mills (Arizona)

[36] USE OF COMPUTERIZED IMAGE ANALYSIS IN QUANTIFYING CRAFT SPECIALIZATION

The standardization hypothesis is extended beyond the study of vessel form and clay composition to include standardization in the preparation of ceramic tempering materials through textural analysis. Video image analysis provides an alternative to traditional methods of point counting for the study of ceramic texture. As with most new techniques however, its use must be accompanied by baseline

experimental data. Our work with sherd-tempered replication tiles is discussed to illustrate how controls for (1) natural inclusions in the clays, (2) accurate identification of temper particles, and (3) accurate quantitative summaries may be introduced into computerized image analysis of ceramic thin sections.

Seymour, Deni (Mariah Assoc.)

[107] FROM MICRO TO MACRO: RECONSTRUCTING ECONOMIC INTERRELATIONS FROM THE GROUND UP

Intra-site economic interrelations can be reconstructed at numerous levels but derivation of robust interpretations requires building inferences from the ground up. Whether focusing on structures or extramural activity areas, behavioral boundaries can be identified and their content and organization analyzed. Through analysis and comparison of patterned data sets at Snaketown it is possible to identify activities that are replicated across space or restricted in spatial extent. Through such means the physical attributes and extent of economically cooperating units can be identified. Changes in configurations of related activity centers can be used to trace changes in the behavioral realm.

Shackley, M. Steven (Phoebe Hearst Museum of Anthropology-California)

[72] GAMMA RAYS, X-RAYS, STONE TOOLS AND THE SOURCING MYTH: ARE WE MISSING THE POINT?

For nearly 30 years the scientific analysis of archaeological lithic material, particularly obsidian, has contributed much to our understanding of procurement, exchange, group interaction, and technology. The instrumental capabilities of these studies including energy dispersive x-ray fluorescence (EDXRF), and neutron activation (NAA) have increased tremendously, but in most regions of the world archaeologists have been slow to integrate these advances in the designs for research. Much of this is a failure of archaeometry to communicate these advances to archaeology in a meaningful way. A few recent examples serve to illustrate the problem and a number of probable solutions are offered for both the archaeometrist and the archaeologist.

Shaffer, Harry (Texas A&M)

[100] TRANSITIONAL PUEBLO DEVELOPMENT IN THE MIMBRES VALLEY, NEW MEXICO

The shift from pithouses to cobble-adobe pueblo-style architecture marked significant changes in the Mimbres community organization. Most scenarios describe an abrupt change from one type of structure to another. Using new data from the NAN Ruin, it appears that the process, once started in the early 10th century A.D., took nearly a century to complete. The shift began by modifying pithouses and later constructing cobble-adobe rooms with sunken floors in the late 10th century. These architectural changes were accompanied by mortuary variability, ceramic style change, and changes in storage facilities, all of which are addressed.

Shaffer, Brian (Texas A&M)

[45] RECOVERY, SKELETAL REPRESENTATION, CONTEXT, AND ETHNOGRAPHIC LITERATURE: THE CULTURAL ASPECT OF GOPHERS IN THE ARCHAEOLOGICAL RECORD

Gophers have historically been unfairly classified as non-cultural, intrusive taxa in archaeological assemblages, most notably due to their burrowing behavior within, and destruction to archaeological sites. Although archaeologists consider gophers as destructive pests, they were also preyed upon by prehistoric peoples. Since direct evidence for gopher consumption is rare, several lines of evidence including recovery, skeletal representation, and context all indicate that gophers were procured prehistorically. This information compares well with the ethnographic literature which shows that gophers were hunted for medicinal purposes, food, and for crop protection.

Shane III, Orrin and William Yourd (Chipewa National Forest)

[108] CHANGES IN THE LEECH LAKE FISHERY AS INFERRRED FROM FISH REMAINS AT A 19TH CENTURY TRADING POST ON HORSESHOE BAY, LEECH LAKE, MINNESOTA

Ecological data derived from archaeological contexts is important for evaluating present-day ecosystems, since such information provides baseline data that is often lacking for natural systems altered by modern human impacts. In this example from a fur trading post on Leech Lake, Minnesota, middens of fish remains from ca. AD 1820 and 1860 are compared with modern fisheries survey data from 1950-1990. Analyses document changes in community structure, species diversity, and condition of fishes. These results have implications for current management of the Leech Lake fishery by the Leech Lake Band of Anishinabe and the State of Minnesota.

Shaw, Leslie (Massachusetts)

[95] ARCHITECTURE AND RITUAL OF EMERGING INEQUALITIES AT KICHPANHA, BELIZE

The results of excavations at Kicpanha in northern Belize indicate that, although this site was relatively modest in size, an elite class was firmly established there by the end of the Late Preclassic

Period and actively participated in the symbolism of the early Maya kingships. A review of Late Preclassic and Early Classic Period architecture and ritual activity at the site shows that Kicpanha was an active player in the developing complexity of the Lowland region. The importance of moderate-sized sites within regional and long-distance interactions will be addressed, using Kicpanha as an example.

Shaw, Robert (Alaska Division of Parks)

[19] STATE AND FEDERAL ARCHAEOLOGY IN ALASKA

Alaskan archaeological research by individuals through the 1930s evolved from Arctic natural history expeditions of the 1800s. After World War II greater numbers of seasonal researchers re-established Alaskan archaeology from Lower '48 institutions. Resident Alaskan archaeologists increased through the 1960s by which time students were being regularly fielded through the mentor system. BLM maintained the first inventory of archaeological sites in the 1970s. Through the 1970-80s state and federal agencies hired archaeologists to service active federal land management and state land transfers to found the modern CRM based system.

Shay, Thomas (Manitoba)

[90] THE USES OF PLANTS DURING THE LATE PREHISTORIC PERIOD IN THE NORTHEASTERN PLAINS

The late prehistoric period on the Northeastern Plains was marked by population growth, the emergence of horticultural villages along the major rivers, and stepped up trade. Plant use seems to have increased over time throughout the region. Charred food plants common to all sites and all time periods include the remains of berries and fresh fruits (*Prunus*, *Rosa*) and weedy annuals (*Chenopodium*, *Polygonum*). Less widespread were the fruits (*Rubus*, *Fragaria*, *Amelanchier*) and annuals (*Iva*, *Rumex*). These trends are based upon an analysis of over 100 taxa among 8,000 seeds in 400 samples from 18 sites.

Sheehy, James (Penn State)

[81] SAN MARTIN ORANGE AND THE STAGES OF CERAMIC PRODUCTION IN TLAJINGA 33, TEOTIHUACAN, MEXICO

This paper summarizes the stages of production of San Martin Orange ceramics produced in Tlajinga 33, Teotihuacan, Mexico, during the Xolalpan Period. The results of analytical studies indicate that the Tlajinga potters extracted local clays, employed basal molds, used coil as well as slab forming techniques, fired vessels in a surface or pit-oven environment and graded their ceramic products. Comparison of these data with those from ethnoarchaeological studies of modern potters groups suggest that the Tlajinga potters were practicing a mode of ceramic production consistent with specialized household production.

Sheets, Payson (Colorado, Boulder)

[53] GROWING, PROCESSING, AND USING MAGEY (AGAVE) IN THE CEREN HOUSEHOLD, EL SALVADOR

A maguey garden was preserved by volcanic ash at the Cerén site 1400 years ago. New plants sprouted from the roots of older plants. Leaves were cut, de-pulped, and fibers twisted into two-ply twine of varying thicknesses. Twine was used in house construction, for net bags, to suspend vessels, to tie a duck, and to make shelves, doors, and fences. The maguey-processing technology utilized in Central Mexico (Parsons 1990) is more complex than the historic Salvadoran tradition. The Salvadoran tradition apparently has deep prehistoric roots. Unfortunately, the Salvadoran technology does not preserve as well in the archaeological record.

Shelley, P. (see Durand, S.) [35]

Shelley, S. (see Homburg, J.) [107]

Sherwood, R. (see Ross, J.) [3]

Shimada, Izumi (Harvard) and Jo Ann Griffin

[12] MANUFACTURE AND USE OF SUMPTUOUS METAL OBJECTS FROM HUACA LORO, PERU

This paper describes the interdisciplinary analysis of over 70 major precious metal objects, part of ca. 1.2 tons of diverse goods excavated from an intact Middle Sicán (A.D. 1000) elite shaft-tomb at Huaca Loro, Batán Grande, northern Peru. Many, such as earspools, crowns and other head ornaments, were found in multiples and are in a fine state of preservation. Their technical, stylistic and compositional variability presents a unique opportunity to clarify original appearance and use, as well as the

organization of production (down to workshop and perhaps even individual craftsman levels) including decisions in selecting specific techniques and materials.

Shun'kov, M. (see Nash, D.) [111]

Sievert, April (Shippensburg), Lane Beck and Eliot Hoyt (Harvard)

[37] MAYA SACRIFICE: MORE THAN A HEART-WRENCHING EXPERIENCE

Traditional views of Maya sacrifice focus on removal of the living heart. Although heart excision may have been a cause of death, a combination of morphological analysis of human remains, use-wear analysis of lithic tools, and microscopic analysis of cut marks on human bone suggest that the process did not stop there. Human remains from the Sacred Cenote at Chichén Itzá and Uaxactún exhibit extensive modification, explaining in part the intensive butchery marks documented for certain Maya lithic artifacts. Defleshing and dismemberment, along with the conversion of body parts to other ritual artifacts, clearly form a part of the total ritual picture.

Sijohn, J. (see Ross, J.) [3]

Silverman, H. (see Pazos, M.) [85]

Silverman, Helaine (Illinois-Urbana)

[16] MONUMENTALLY UNMONUMENTAL: THE CASE OF CAHUACHI

For decades Cahuachi, long regarded as the early Nasca capital, was described as an exemplar of an alleged urban tradition on the south coast of Peru. Recent fieldwork, however, reveals that Cahuachi had a scarce permanent population, was the locus of intense ceremonial activities possibly revolving around a pilgrimage cycle, and was "monumentally unmonumental"—built by terracing naturally truncated hills rather than creating massive free-standing architecture as was the case elsewhere along the Peruvian coast at this time (c. A.D. 1-300). Among the dense settlement pattern of supporting habitation sites in the neighboring valleys is one whose size and density of agglutinated architecture suggest that it was the urban (or urban-like) center Cahuachi was not. The nature of early Nasca sociopolitical organization and the role of ceremonialism and possible urbanism in integrating the component Nasca groups are examined.

Simek, J. (see Hoffman, R.) [45]

Simmons, Alan (Desert Research Institute) and Renee Corona (Nevada)

[64] THE NEOLITHIC OF WESTERN CYPRUS—TEST INVESTIGATIONS AT KHOLETRIA ORTOS

Neolithic developments in Cyprus are unique and follow a distinct pattern from the adjacent Near Eastern mainland. Relatively little is known about the Cypriot Neolithic, however, since only a few sites have been systematically excavated. This presentation summarizes limited excavations at Kholeria Ortos, a large aceramic Neolithic settlement located on the western end of Cyprus. Initial indications are that the site varies considerably from other documented Neolithic occurrences on the island. We explain this as a result of ecological diversity in western Cyprus. Future study will examine the impact of early Neolithic economies on an island environment.

Simon, Arleyn

[72] WHAT ARCHAEOOMETRY HAS OR HAS NOT DONE FOR ARCHAEOLOGICAL CERAMIC STUDIES

To a large extent, ceramic studies have benefited from archaeometric research in the last several decades. Contributions from archaeometry have focused on questions of provenance and to a lesser extent, issues of technology. However, the degree to which archaeometric techniques have been applied to archaeological questions is variable. The contributions of archaeometric research to ceramic studies and the development of archaeological frameworks to utilize such data are examined. The power of interdisciplinary ceramic data to address questions of human behavior is discussed within the context of contemporary archaeological practice.

Simonetti, Javier (Universidad de Chile) and Luis Cornejo (Museo Chileno de Arte Precolombino)

[45] SMALL MAMMALS AS HUMAN PREY: SPATIO-TEMPORAL VARIABILITY

Small mammals are buffer food resources for human population. In coastal Andean sites of central Chile, small mammals were exploited on a selective basis, but consumption was opportunistic. Prehistoric populations selectively consumed rodent species of large body size and weight, which are diurnal and fossorial or colonial. Consumption, though, was temporally and spatially variable. If profitable reliable resources were available, rodent consumption was secondary, albeit selective. That is the case of coastal population and horticulturalists. The former relied more heavily on marine

resources, while the latter included crops in their diet. If preferred food items are scarce or variable, rodents may be consumed more often.

Sims, D. (see Jackson, E.) [67]

Skibo, James (Illinois) and Michael Schiffer (Arizona)

[28] THE CLAY COOKING POT: AN EXPLORATION OF WOMEN'S TECHNOLOGY

Broken pieces of the cooking pot, one of the most common archaeological finds, have been analyzed and discussed in nearly every conceivable way. Yet, one aspect of the clay cooking pot is rarely mentioned: that it was a woman's technology. This paper demonstrates, with ethnographic and archaeological data, that pottery made at the household level is manufactured by women. We also discuss how it is possible to reconstruct, through experimentation, prehistoric pottery manufacture and use to gain insights into a technology controlled by women.

Skibo, James (Illinois) and Michael Deal

[72] FOOD RESIDUE AND POTTERY FUNCTION: CRITICAL ASSESSMENT

Organic food residues often adhere to or are absorbed within pottery vessels during use. Linking residues on prehistoric pots to specific plant or animal species provides a direct archaeological method for determining pottery function and reconstructing diet. Many recent studies have focused on fatty acids. However, problems with preservation and/or high resolution identification have plagued the analyses to date. We offer, from an archaeological perspective, an assessment of fatty acid organic residue analysis. Based on our recent experience with these techniques, we outline the continuing problems with fatty acid analysis and suggest how research in this area may be further advanced.

Slaughter, M. (see Harry, K.) [51]

Slaughter, Mark and Linda Gregonis (SWCA Environmental Consultants)

[107] ARTIFACTS, FEATURES, AND AGAVE USE: AN ASPECT OF TECHNOLOGICAL ORGANIZATION AT LA CIUDAD DE LOS HORNS

In this age of specialists, meaningful behavioral assemblages are often overlooked in favor of analysis of individual artifact and data categories. At La Ciudad de Los Hornos, evidence of the agave processing cycle was obtained from analyses of flaked stone, ground stone, ceramic artifacts, subsurface features, as well as macrobotanical and microbotanical data. Using these multiple lines of evidence, the authors have been able to synthesize information on several aspects of the agave processing cycle, including preparation of the plant after harvesting, food and fiber preparation, discard and waste, and recycling of materials and features related to agave processing.

Slawson, Laurie (Cultural & Environmental Systems)

[100] SITE UTILIZATION, SETTLEMENT PATTERNS, AND LITHIC TECHNOLOGY: AN ANALYSIS OF THE ARCHAIC/HOHOKAM OVERLOOK CAVE SITE

Excavations at the Overlook Cave Site in south-central Arizona yielded an extensive array of perishable and nonperishable artifacts and ecofacts. Distinct spatial distributions of work areas, living areas, and discard areas were identified within, and adjacent to, the cave, which was occupied from approximately 5000 B.P. to 500 B.P. Through the analysis of artifacts related to lithic manufacture, the reconstruction of site formation processes, and the use of a Geographic Information Systems (GIS) approach, the prehistoric patterns of site utilization at Overlook Cave are developed and the site's place in the local subsistence-settlement system is discussed.

Smart, Tristine (Michigan)

[59] THE CONTEXTS OF PRESTIGE SYMBOLLING: SOME CROSS-CULTURAL LESSONS FROM OHIO HOPOWELL AND THE NORTHWESTERN EUROPEAN BRONZE AGE

Studies of possible prestige symbols in the Northwestern European Bronze Age frequently focus on contrasting contexts of deposition, e.g., grave goods vs. ritual hoards, public vs. hidden, and retrievable vs. nonretrievable. The depositional contexts of possible prestige symbols in Ohio Hopewell are examined in light of these contrasts. The implications of these depositional contexts for the interpretation of prestige symbolling in the past are also considered. By examining the similarities and differences in these two archeological examples, we can develop more sophisticated interpretations of prestige symbolling as a cultural process.

Smith, Bruce (Smithsonian Institution) [Discussant 42]

Smyth, M. (see Dore, C.) [37]

Smyth, M. (see Logan, D.) [97]

Smyth, Michael (Cincinnati)

[76] LETTING THE PRESENT SERVE THE PAST: THE DYNAMICS OF AN ANCIENT MAYA COMMUNITY

To know the past one must study the present. This statement reflects a central concern of anthropological archaeology which seeks to link contemporary and archaeological records in ways to build a better understanding of the past. Two completed field seasons at the ancient Maya center of Sayil have produced intensive site-scale surface data that reflect community settlement patterns. The next interpretive stage of this research draws upon the contemporary record, mainly Puuc ethnoarchaeology, to establish controlled inferences and relevant behavioral models of Maya community organization centering on site-wide activities and community behavior across the entire urban center.

Snake, Reuben (Winnebago Tribe)

[3] INDIAN SACRED LANDS AND RELIGIOUS FREEDOM

Sacred sites of Indian people are not given the same respect accorded to churches. A historical perspective of geopolitics and religion brings the issue of Indian sacred sites into focus. Indian groups around North America are organizing to protect religious freedom and sacred sites. Increased interaction and understanding between archaeologists and Indians dealing with sacred lands issues is important to ultimate solutions.

Snarskis, Michael (IICA)

[60] THE LAND BETWEEN: COSTA RICAN ARCHAEOLOGY DURING THE LAST 25 YEARS

The last 25 years of scientific investigations in Costa Rica have elucidated many aspects of cultural evolution and interpretation of significance to New World archaeology. While its populations evolved "in place" via local adaptation rather than migration, it has yielded artifact and settlement pattern complexes that reflect a position on a shifting cultural frontier. Northern (Mesoamerican) influences gradually yield to South American affinity over time, in prestige material (jade/gold), house type (rectangular/round) and settlement pattern (dispersed/internally-opposed). Diachronic exploitative strategies have also shifted from inland sites to coastal niches. Modern methods (remote sensing) are moving Costa Rican archaeology into a mature cross-disciplinary test of these patterns.

Snow, Dean (Albany, SUNY)

[109] ARCHAEOLOGY AND PUBLIC POLICY IN NEW YORK

The size and complexity of New York bureaucracy rivals that of the federal government. Archaeologists working in New York must be mindful of programs, obligations and opportunities at both the federal and state levels. Recent history suggests that archaeology and the historic preservation movement will become increasingly closely associated in the next century, and that archaeologists should be looking to take advantage of the resulting opportunities. Academic archaeologists are advised to view these opportunities as supplementary to grant-supported research, and preferable to standard contract archaeology.

Snow, Susan (Iowa)

[28] CONSTRUCTED IMAGES AND THE ARCHAEOLOGICAL RECORD IN THE NEW WORLD TROPICS

This paper will examine how constructed images of cosmology can be identified in the archaeological record. First a brief definition of constructive imagination and constructed images will be discussed. Then the applicability of using this definition to look for clusters of constructed images within the material culture remains will be outlined. Data from the New World tropics will be used to illustrate the application because we can identify past environmental phenomena and also assume a level of environmental similarity within the tropics.

Snyder, L. (see Klipper, W.) [64]

Sobolik, Kristin (Maine)

[8] INTRODUCTION: THE IMPORTANCE OF PALEONUTRITION AND A SUMMARY OF A CONFERENCE

The history of dietary research in archaeology indicates that each dietary discipline has developed and evolved as a separate field, with little integration between the disciplines. Integration, however, is necessary to determine the diet, health, and nutrition of a prehistoric population and such analyses are becoming more common in archaeological reconstructions. This paper presents the background and results of a conference on paleonutrition in which researchers interested in all aspects of dietary and health reconstruction were brought together to present their research and discuss the positive aspects and inherent limitations in conducting integrative research. The result was a consortium

of bioarchaeologists, zooarchaeologists, paleoethnobotanists, coprolite analysts, archaeologists, and anthropologists discussing the past, present, and future of paleonutritional research.

Soffer, O. (see Adovasio, J.) [64]

Soffer, Olga (Illinois)

[25] THE MUTABILITY OF UPPER PALEOLITHIC "ART" IN CENTRAL AND EASTERN EUROPE: PATTERNING AND SIGNIFICANCE

The "creative explosion" in Central and Eastern Europe during the Upper Paleolithic is very discontinuous in time, space, medium, context, and intentionality. This paper critically examines this record to 1) document the extant patterning, and 2) examine the variables responsible for the observed patterning. This regional record is then contextualized within the global record to see what regional historic as well as universal normative implications it may hold.

Spielmann, Katherine (Arizona)

[41] THE EVOLUTION OF A FRONTIER: PLAINS-PUEBLO RELATIONS IN THE FIFTEENTH CENTURY

Prior to the mid-1400s the southern Plains and the eastern portion of the Pueblo world are characterized by commonalities in adaptations, cultural inventories, and biological characteristics. Thus, the identification of a boundary between the two areas is problematic and not to the point. However, the historical processes of Pueblo migration into the Rio Grande valley, Pueblo aggregation, and the arrival of Athapaskan populations on the southern Plains created a situation of contrast that profoundly altered Plains-Pueblo relations in the fifteenth century. This paper elaborates on the transition in pre-historic Plains-Pueblo relations.

Stafford, C. Russell (Indiana State)

[43] APPLYING DISTRIBUTIONAL ARCHAEOLOGY TO THE SUBSURFACE: SOME INITIAL OBSERVATIONS

Distributional Archaeology has been advocated as a regional approach to the study of landuse. Many landscapes, however, are, at a minimum, geologically dynamic over the late Pleistocene and Holocene resulting in the burial of artifacts below landform surfaces. If Distributional Archaeology is to be effective, sampling of the subsurface must be incorporated. In this paper I suggest a geomorphic approach based on sampling landform/sediment assemblages and discuss alternative subsurface recovery techniques. Sampling focused on estimates of artifact concentrations in sediment units is advocated. Estimates are enhanced if both macro and micro artifacts are recovered. Examples from the Midwest U.S. are presented.

Stager, Lawrence (Harvard)

[110] OLIVE OIL: FUELING THE ECONOMY OF THE LEVANT AND EGYPT IN THE EARLY BRONZE AGE

Texts from the eighth century B.C. to Ottoman times suggest that the Levant was the leading producer, and Egypt the leading consumer, of olive oil. This relationship was already established by the Early Bronze Age (3500-2250 B.C.). Discoveries of Early Bronze oil factories permit the identification of pottery vessels used in the processing, storing and transporting of olive oil. The demand for oil, especially from Egypt, and the corresponding increase in oil production in parts of Syria-Palestine, coincides with early state formation. This paper assesses the role of oil in the emergence of early Levantine states.

Stanish, Charles (Field Museum of Natural History) [Discussant 48]

Stanish, Charles (Field Museum of Natural History)

[62] THE INCA OCCUPATION OF THE JULI-POMATA REGION, LAKE TITICACA, PERU

This paper describes settlement patterns during the Late Intermediate Period and Late Horizon in the Juli-Pomata area in the southwestern Titicaca Basin, Peru. These data are used to assess models of Inca statecraft in Lupaqa territory, one of the great Aymara polities of the Titicaca region.

Stanish, Charles (Field Museum of Natural History)

[85] A GENERATION OF ARCHAEOLOGICAL RESEARCH IN THE SOUTH CENTRAL ANDEAN HIGHLANDS

This paper reviews the progress made in the archaeology of the south central Andean highlands over the last 25 years. I will emphasize the empirical and theoretical advances made in three geographical areas: the circum-Cuzco region, the Arequipa-Moquegua highlands, and the north and west Titicaca Basin in the Department of Puno of Peru. Finally, this paper will offer a brief review of the most salient research problems for future research.

Stark, B. (see Curet, L.) [49]

Stark, Barbara (Arizona)

[49] STYLISTIC ZONES AND POLITICAL GEOGRAPHY IN ANCIENT VERACRUZ

Investigations at the upper Belize River Valley site of Cahal Pech have recorded a stratified sequence of occupation that spans from the early Middle Formative (1000 B.C.) to the Late Classic period (A.D. 900). This paper describes the morphology of Formative occupation at the site, and it discusses the regional and interregional implications of this data.

Stark, M. (see Longacre, W.) [39]

Steadman, David (New York State Museum)

[70] STRATIGRAPHY AND CHRONOLOGY OF AVIAN EXTINCTION IN EASTERN POLYNESIA

The Tangataitau Rockshelter (site MAN-44, Mangaia, Cook Islands) has produced 1000 identifiable bird bones with exceptional chrono-stratigraphic data. Of the 14 extirpated species of landbirds recorded at MAN-44, 11 occur only in the 5 deepest of 19 major strata, dated at 700-1000 yr B.P. Similar extinction chronologies exist for Tahuata (Marquesas Islands) and Huahine (Society Islands), while the loss of most landbirds occurred centuries earlier on some other islands in the Cooks and Marquesas. Interisland differences in chronology of avian extinction suggest that the permanent settlement of East Polynesian islands was asynchronous even within archipelagos.

Stephens, Jeanette (Southern Illinois) Michael Hargrave and Charles Cobb

[82] A LOCATIONAL ANALYSIS OF MISSISSIPPIAN MOUND CENTERS IN SOUTHWESTERN ILLINOIS

Large Mississippian-period settlements are generally located in floodplain environments, in proximity to aquatic resources and fertile, well-drained soils suitable for horticulture. Site location is also affected by proximity to key resources such as chert and secondary streams providing access to adjacent uplands. The importance of these factors is evaluated in a locational analysis of four Mississippian sites situated in the Mississippi River floodplain of extreme southwestern Illinois. The environmental settings of the Ware, Linn, and Dogtooth Bend mound centers and the Twenhafel site are compared in order to evaluate ecological aspects of Mississippian settlement in that region.

Steponaitis, Vincas (UNC-Chapel Hill)

[102] POPULATION TRENDS AT MOUNDVILLE

The chronological distribution of middens and burials at Moundville is examined. Midden evidence suggests that the site's resident population was large during the Moundville I phase (AD 1050-1250), and considerably smaller during the Moundville II and III phases (AD 1250-1550). The frequency of burials shows exactly the opposite pattern. These data imply that the nature of the site changed through time, reflecting broader processes in the development of the Moundville polity.

Stewart, Michael (Temple) [Discussant 40]

Stiner, Mary (Loyola University of Chicago)

[89] RESEARCH ON THE TAPHONOMY OF SMALL ANIMAL REMAINS FROM

ARCHAEOLOGICAL SITES: THREE CASE STUDIES

Whereas small animal remains from archaeological sites are often integral to arguments about human diet, use of these data is complicated by the normal influences of other, coexisting carnivores on bone midden formation. This paper describes on-going research on ways to distinguish human and canid modification of the bones of lagomorphs and other small prey in archaeological contexts. Working from modern control sets consisting of bone from the scats of free-ranging canids, three archaeological cases from the Basketmaker (Arizona), Epipaleolithic, and Middle Paleolithic (Italy) cultural periods are examined.

Stocker, T. (see Howe, K.) [66]

Stoltman, James (Wisconsin-Madison)

[0] A RECONSIDERATION OF THE CULTURAL PROCESSES LINKING CAHOKIA TO ITS NORTHERN HINTERLANDS DURING THE PERIOD AD 1000-1200

The period from ca. A.D. 1000 to A.D. 1200 witnessed an intensity of interregional cultural interaction in the Midcontinent rivaled only by the Hopewell Interaction Sphere 1000 years earlier. In this paper the archaeological evidence for Cahokia-northern hinterland culture contact is reviewed. At least five distinctive forms of culture contact are recognized indicating that no single culture process (e.g. migration) can satisfactorily account for the available archaeological evidence.

Styles, B. (see White, K.) [91]

[47] CERAMIC PASTE AND BODY VARIABILITY AS INDICES OF CULTURAL

INTERACTION BETWEEN CAHOKIA AND ITS NORTHERN HINTERLANDS DURING THE PERIOD A.D. 1000-1200

Petrographic analysis was conducted on a series of ceramic vessels of the types Powell Plain and Ramey Incised from the American Bottom and from the major Cahokia-influenced sites to the north of the American Bottom dating to the interval A.D. 1000-1200. In addition, for comparative purposes, companion vessels of demonstrable local manufacture were included from the northern hinterland site. Through the comparison of both quantitative and qualitative data generated by this analysis, a pan-regional ceramic recipe for Powell-Ramey ceramics can be identified that suggests localized production and redistribution of these types from the American Bottom.

Stone, Glenn (Columbia)

[76] WHAT, IF ANYTHING, IS SETTLEMENT ECOLOGY?

Archaeologists have developed or adopted theoretical frameworks for hunter-gatherer settlement patterns and market town settlement patterns, but the theory of agrarian settlement remains poorly developed. This paper outlines an approach to settlement ecology focusing on the effects of agricultural ecology and relations of agricultural production on spatial organization. This approach is particularly concerned with responses to rising land pressure, and it differs from landscape ecology in its stress on the relationship between the social and physical landscapes. Ethnoarchaeological data on the Nigerian Kofyar show which aspects of an agrarian settlement pattern are best explained by settlement ecology.

Storey, R. (see Lee, C.) [57]

Storey, Rebecca (Houston)

[112] EUROPEAN CONTACT AND HEALTH: THE EVIDENCE FROM TWO SKELETAL POPULATIONS FROM THE APALACHEE PROVINCE, NORTH FLORIDA

A good test case of the effect of European contact in the Americas is provided by comparing skeletons from the precolumbian Mississippian chiefdom Lake Jackson Mound 3 site and the Spanish mission at Patale. Following one population from precontact to early contact allows insight into how lifestyle changes and new diseases affected Native Americans. Comparison of age-at-death profiles and paleopathological indicators here reveal that the impact of contact was complex and not necessarily all negative. The effects of contact on health probably varied from group to group and were influenced by the nature of the precontact culture.

Stout, Charles (Illinois) and Barry Lewis (Illinois)

[33] ON THE NATURE OF WESTERN KENTUCKY MISSISSIPPION TOWN COMPOSITION

Although much has been written about Mississippian architectural elements and town plans, the literature generally falls short of presenting an understanding of these towns as communities, especially where ethnohistoric data are lacking; the archaeological chiefdoms associated with Mississippian towns seem little more than metaphorical appendages to the people who built and lived in them. Within the context of a regional interpretation of Mississippian communities, we discuss a developing functional grammar of western Kentucky towns and discuss their cultural implications. Individual towns illustrate rules or exceptions to them.

Stout, S. (see Kandare, R.) [108]

Straus, Lawrence (New Mexico) [Discussant 34]

Straus, Lawrence (New Mexico) Marcel Otte, and Paul Haesaerts (Belgium)

[64] UPPER PLEISTOCENE HOMINID ADAPTATIONS IN SOUTHERN BELGIUM

Basal strata in Trou Magrite reveal ephemeral occupations by Neandertals, and extensive use by carnivores and owls. Upper levels with rich Aurignacian artifacts and faunal assemblages terminated at 27 ka bp. There are taphonomic indications of a high degree of intactness. Retouched tools are mainly on imported flint, whereas local limestone was used to produce simple flakes and blades. The open-air site of Huccorgne shows extensive in situ flint blade production, with numerous refits in the Gravettian level (23 ka bp). Mammoth, horse and red deer were hunted during a brief humid phase before the Last Glacial Maximum. A separate area produced Mousterian artifacts with Levallois cores.

Stuart, D. (see Houston, S.) [53]

Styles, Bonnie (Illinois State Museum)

[8] THE VALUE OF ARCHAEOLOGICAL FAUNAL REMAINS FOR PALEODIETARY RECONSTRUCTION

Faunal remains from archaeological sites provide critical data for paleodietary reconstructions. They do not represent a complete inventory of animal foods, much less the exact quantities of meat and nutrients; however, they provide dietary evidence unattainable through studies of paleofeces and human skeletons. Studies of midwestern sites, primarily from Illinois and Missouri, document temporal shifts in Holocene faunal assemblages. For the most part, these studies do not examine nutrition, *per se*. However, the importance of nutrition has been considered by other researchers through linear programming models. These models, although subject to their own problems, provide a framework for examining the potential importance of these subsistence shifts to human nutrition. This study emphasizes animal foods, but integrates botanical data from the region and bioanthropological data when possible.

Styles, Bonnie (Illinois State Museum)

[55] THE CHANGING USE OF FAUNA IN HUMAN SUBSISTENCE STRATEGIES

Faunal remains from Holocene archaeological sites in the Central Mississippi River Valley document changing faunal availability and exploitation strategies. Early Holocene faunal assemblages show distinctly high representation of small mammals, in conjunction with white-tailed deer. In the Middle Holocene, proportional representation of white-tailed deer and aquatic resources increases. These subsistence shifts are attributed to natural environmental changes, such as the opening of the forest and floodplain evolution during the Hypsithermal, and cultural changes, such as in the distribution and duration of human occupations. Late Holocene sites show an upward trend in the use of aquatic resources and an apparent decrease in the representation of terrestrial resources, especially white-tailed deer. These trends reflect the economic strategies and impacts of more sedentary populations with a greater reliance on cultivated plants.

Sugiyama, Samburo (Arizona State)

[81] MEANINGS AND FUNCTIONS OF PREHISTORIC LOOTING AT TEOTIHUACAN, MEXICO

Archaeological evidence of prehistoric looting episodes at Teotihuacan is examined. The looting at monuments is viewed as both consequence and cause of historical interactions in Mesoamerica. Radiocarbon dates from the looters' tunnel discovered recently in the Feathered Serpent Pyramid indicate that the looting began early in the Classic Period. Later, Aztecs looted and used Teotihuacan artifacts to legitimate their religious and political hegemony. Possible ideological motives for looting graves in monuments are discussed, and the socio-political implications are considered in the light of new excavation data. The original burial contexts before looting are reconsidered in this interpretative framework.

Sullivan, L. (see Garber, J.) [75]

Sullivan, L. (see Neusius, S.) [80]

Sutliff, Marie (Politecnica Litoral-Ecuador)

[27] THE PRODUCTION AND USE OF WIRE IN LATE PRE-HISPANIC METALLURGY OF SOUTHERN COASTAL ECUADOR

Cast circular wire has recently been identified as one of several wire-making techniques used by late prehispanic metallurgists of southern coastal Ecuador. Wire formed an integral part of the metallurgy practiced in this region as it provided one of the most common construction elements used to produce a wide array of ornaments and implements. This paper discusses the role of cast circular wire in the development of late prehispanic metallurgy, both as a finished construction element and as a cast blank, and also demonstrates how certain wire artifacts may be useful archaeological indicators of often overlooked metal-working contexts.

Sutter, Richard (Columbia)

[9] SOCIAL STRATIFICATION OF DENTAL PATHOLOGIES FROM CHIRIBAYA ALTA, A LATE INTERMEDIATE SITE

Dental remains from 3 cemeteries at Chiribaya Alta, a Late Intermediate Period (A.D. 1000 A.D. 1350) site in southern Peru, indicate status differences in dental pathologies. Samples include 134 individuals from 3 cemeteries stratified on the basis of burial styles and associated goods. Data include Canes Index, Decayed-Missing (DM) Index, and dental wear scores. Age controlled analyses demonstrate high status individuals had poorer dental health and higher dental wear scores than low status individuals. These results suggest individuals of high social status had a more canogenic diet than those of low status.

Sutton, Mark (California State) and Karl Reinhard (Nebraska)

[8] CLUSTER ANALYSIS OF THE COPROLITES FROM ANTELOPE HOUSE: IMPLICATIONS FOR ANASAZI DIET AND CUISINE

A cluster analysis was performed on the constituent results from 173 coprolites from Antelope House, an Anasazi site dating between PII and PIII. The samples were from a number of latrines spanning the late Pueblo occupation of the site. The results are used to interpret dietary preference and food combination patterns over time and to present a view of Anasazi cuisine.

Sutter, Mark and Robert Yohe, II (California State)

[58] MID-HOLOCENE SETTLEMENT AND SUBSISTENCE ADAPTATION IN THE MOJAVE DESERT

At the end of the Pleistocene, a large interior lake system was present in the Mojave Desert and people were adapted to the associated environments. As early as 9000 B.P., conditions had become more xeric, resulting in the desiccation of the lake systems and a shift in settlement/subsistence activities to other ecozones. The situation persisted until the Mid-Holocene when environmental conditions improved (ca. 4,000 B.P.). At that time evidence of increased moisture, a distinct change in lithic technology, increased social complexity, and increase in population (e.g. in known sites) are evident in the archaeological record. Several settlement/subsistence models are outlined to account for these changes.

Szuter, Christine (Arizona Press)

[8] NUTRITION, SMALL MAMMALS, AND AGRICULTURE

The significant role of small mammals in the diet of prehistoric agriculturalists in the Greater Southwest is addressed in this presentation. Changes in methodologies have led to the greater recovery of small animals allowing for the assessment of their depositional history and in turn a consideration of their role in the diet. The modifications prehistoric inhabitants made to their environment through agriculture and associated activities created an environment particularly favorable to small animals such as rodents and lagomorphs. The hunting of small animals, however, extended far beyond garden hunting and was incorporated into other daily activities. Changes in socio-economic and demographic factors that accompanied agricultural activities are argued to have contributed to the importance of small animals in the diet.

Takac, Paul (Texas-Austin), Michael Collins (Texax Archaeological Research Laboratory) and Wulf Gose (Texas-Austin)

[28] THE ARCHAEMAGNETIC INVESTIGATION OF BURNED LIMESTONE ROCKS: AN INTERPRETIVE TECHNIQUE

Much of the prehistoric archaeological record of central Texas is characterized by the presence of burned limestone accumulations (a continuum from "hearts" to "burned rock middens"). Hypothesized functions are examined at sites spanning the Early Archaic to Late Prehistoric through the application of archaeomagnetic techniques. The vectors of thermoremanent magnetization retained in the individual rocks comprising these features are used to address formation processes, functional and technological attributes, and prehistoric human behavior. Traditional "hearts" can be subdivided into waste dumps, simple hearths, and earth ovens. The formation of "middens" involves various and complex processes.

Tanaka, Yoshiyuki (Kyushu)

[4] TOOTH MEASUREMENTS AS INDICATORS OF KINSHIP DISTANCE AND POST-MARITAL RESIDENCE PATTERNS IN THE FINAL JOMON OF WESTERN JAPAN

Q-mode correlation coefficients based on tooth measurements obtained from modern skeletal samples in western Japan were applied to Jomon skeletal remains to determine kinship distance. The Jomon samples were taken from several large Final Jomon collections from Ikawazu, Tsukumo, and other shell middens in western Japan. The results suggest ambilateral patterns of post-marital residence among the site inhabitants. These interpretations are compared with the results obtained through other methods, and with samples from succeeding Yayoi and Kofun periods.

Tankersley, K. (see Morrow, J.) [106]

Taylor, R. E. (California)

[72] RADIOCARBON DATING: PAST AND FUTURE REVOLUTIONS

Over the last quarter century, radiocarbon dating as applied to archaeological materials has progressed through several stages. We currently are experiencing the results of "Third Radiocarbon revolution"—the use of AMS (accelerator/atomic mass spectrometry) technology—resulting in the ability to obtain routine ^{14}C analysis a wider spectrum of sample types which allow an expanded range of problems that can be more critically addressed. This paper will review the technical and

conceptual developments associated with the last 25 years of ^{14}C studies in terms of the tree radiocarbon "revolutions" and project possible future developments in ^{14}C studies that might significantly impinge on future archaeological research.

Taylor, Randolph (Berger Associates)

[17] CORRELATING ARCHAEOLOGICAL STRATIGRAPHIC DATA WITH A GENETIC STRATIGRAPHIC FRAMEWORK IN A DYNAMIC RIVER BASIN: IMPLICATIONS FOR THE STUDY OF SETTLEMENT AND CULTURAL STRATIGRAPHY

Archaeological work sponsored by PennDOT has been ongoing since 1989. The effects of a dynamic river system on the distribution of archaeological sites within the active floodplain of the Susquehanna River are considered. Archaeological data are correlated with the genetic stratigraphic framework proposed by Vento. Results suggest that local depositional environments have had a major influence on the archaeological record along this section of the river. Buried Paleosols tend to be infrequent and not as strongly developed as they tend to be along the upper reaches of the Susquehanna. The implications on the study of prehistoric settlement and chronology are discussed.

Taylor, William (Houston)

[67] DIETARY SIGNALS IN PREHISTORIC AND HISTORIC INDIAN SKELETAL POPULATIONS FROM THE APALACHEE PROVINCE OF NORTHERN FLORIDA

Elemental chemical analysis and x-ray diffraction studies have been completed on two Apalachee Indian populations from the Tallahassee, Florida area. An elite Mississippian sample ($n = 14$) from Lake Jackson Mound 3 is compared to the Patale Spanish mission population ($n = 40$) dated c.a. A.D. 1633-1704. Strontium levels and the barium to strontium level ratios indicate that the Patale group had an increased level of meat in their diet relying more on terrestrial resources than marine resources. This subsistence pattern indicates improved diet under the Spanish mission compared to pre-contact conditions.

Teal, C. S. (see Mazzullo, J.) [13]

Teltser, Patrice (Arizona)

[22] NON-SITE SURVEY IN THE CAIRO LOWLAND, SOUTHEAST MISSOURI

While the archaeological record of Southeast Missouri is well known for a variety of historical processes represented, there have been relatively few recent attempts at large scale survey to address such issues. In short, the quality of survey data lags behind other areas of North America. Recent survey data from the Cairo Lowland shows that the physical manifestation of the record is highly variable and more pervasive than accounted for by prominent theoretical models. Non-site methods provide information from a wide variety of contexts, particularly low-density contexts which continue to be an under-rated source of information for addressing many current concerns.

Temme, M. (see Boytner, R.) [50]

Thacker, Paul (Southern Methodist)

[65] WHY STOP HERE? INTER-SITE PATTERNING IN THE UPPER PALEOLITHIC OF PORTUGAL

This paper examines patterning evident in the distribution and configuration of Upper Paleolithic sites in the Ribeira da Pa, Rio Maior, and Penegal drainages in central Portugal. Artifact occurrences correlate with specific geomorphological features, most notably low terraces along drainages. Intensive survey methodology eliminates geological visibility as an explanation of this pattern. Comparison between Gravettian and Magdalenian sites, the two largest samples, reveals that land use, flint procurement, and curation patterns differ between the two periods. Lithic assemblage data are analyzed with attention to flint sources in combination with known technological shifts. The data set illustrates underlying interrelationships between lithic technology, raw material availability, and site distribution.

Theiler, James (Wisconsin)

[55] RESPONSE OF GASTROPODS (SNAILS) TO PALEOENVIRONMENTAL FLUCTUATIONS AND IMPLICATIONS FOR UNDERSTANDING HUMAN SUBSISTENCE

Terrestrial gastropod (land snail) assemblages from the Central Mississippi River Valley are used as proxy indicators for the reconstruction of the paleoenvironmental setting since the end of the Pleistocene. Interpretations based on snails are employed to outline evolving local habitats under the influence of regional climatic conditions. The projected paleoenvironments are supported by other lines of data and illuminate the structure of the regional environment available for human exploitation.

Thieme, Donald

[26] A WATER-BALANCE SIMULATION OF THE CHANGING AGRICULTURAL POTENTIAL OF NORTHERN BLACK MESA, ARIZONA

Changes in the agricultural potential of northern Black Mesa, Arizona are simulated using a water-balance model based on the hydrologic cycle. The model is presented in theoretical form along with several of the resultant maps of productive zones. Methodological assumptions and potential of simulation in comparison with alternative approaches are then discussed and the range of possible farming strategies is systematized. Finally, the significance of the results for explaining patterns of prehistoric settlement and historic land use is summarized.

Thom, B. (see Blake, M.) [11]

Thompson, Charmaine (USDA Forest Service)

[2] CONNECTING ARTIFACTS AND BEHAVIORS: PERIOD PHOTOS AND THE "TIN WAR" SITE IN NORTHEASTERN UTAH

In August 1888, 700 US Army soldiers went to Strawberry Valley, northeastern Utah, for one of the first field maneuvers. The grand spectacle of mock battle also attracted local photographer Charles Carter. His photos record the encampment's layout, and are central to a Passport in Time project at the site, now on the Uinta National Forest. They allow us to correlate artifact scatters with features and tents shown in the photos. The combination of archaeological data and known activities provides a unique opportunity to measure the nature and extent of archaeological remains at a month-long encampment site.

Thompson, Timothy (US Army Corps of Engineers)

[92] PREHISTORIC OCCUPATION AT THE FALLS OF THE JAMES

Excavations at the Maury Street Site, 44CF123, located on a terrace on the south side of the James River at the base of the Falls, revealed a Late Archaic Component and stratified Woodland Components. Tool manufacture from terrace cobbles was an important function of the Late Archaic Component, and at least one of the Woodland Components. Other site functions include exploitation of anadromous fish runs. A consistent pattern of resource exploitation at the Falls Zone through time is shown, along with some implied differences.

Tieszen, L. (see Reinhard, K.) [90]

Todd, Lawrence (Colorado State)

[56] ETHNO AND OTHER ARCHAEOLOGIES: OBSERVATIONAL SCALES AND INTERPRETIVE POTENTIALS

Ethnoarchaeology has produced insights into relationships between human systems and the production, distribution, and eventual discard/loss of items and the creation of a material record. However attempts to use results of ethnoarchaeological studies in archaeological analyses face major differences in scale of observation for the two data sets. Ethnoarchaeology customarily deals with large-scale, event-oriented aspects of site production. Archaeological analysis must address problems of long-term accumulations of information resulting from aggregate actions of human and non-human processes. One way for more convergent results is for ethnoarchaeological studies to place greater emphasis on variables suitable for archaeological analysis.

Tolmie, C. (see Green, W.) [90]

Tomka, Steve (Texas at Austin)

[56] "UP AND DOWN WE MOVE . . .": FACTORS CONDITIONING AGRO-PASTORAL SETTLEMENT ORGANIZATION IN MOUNTAINOUS SETTINGS

A cross-cultural exploration of mountainous environments is used to highlight specific ecological factors that appear to condition agro-pastoral land-use strategies. A broad range of settlement options, common to ecologically similar yet culturally diverse settings, are identified. A closer scrutiny of selected Andean case studies is then used to explore the variability noted in settlement options. Factors such as the geomorphological and climatic characteristics of specific localities, ethological requirements of domesticated animals, cultigen production constraints, and regional demographic patterns are seen as conditioning the specific forms of settlement pattern noted cross-culturally.

Tooker, Elisabeth (Temple)

[63] AMERICAN ANTHROPOLOGY IN THE FORMATIVE YEARS: THE CASE OF THE NEW YORK STATE MUSEUM

Founded as it was in 1845, the New York State Museum affords a convenient illustration of the theoretical concerns of American archaeology and ethnology in the 19th and early 20th centuries.

This paper considers what those concerns were, why they became of interest when they did, and how they and the work they inspired came to be regarded in subsequent years.

Topic, J. (see Topic, T.) [48]

Topic, John (Trent)

[62] ETHNOGENESIS IN HUAMACHUCO

The Inca administration of northern Peru involved a greater restructuring of the local population than previously thought. These changes were of such great extent that both 16th century chroniclers and modern scholars have mistakenly assumed that the people of Huamachuco and Cajamarca belonged to the same ethnic group. In fact, there is little archaeological or ethnohistoric evidence to support that view. The Inca split closely related ethnic groups into different administrative units, lumped unrelated groups together, and modified their internal structure.

Topic, John and Teresa Topic (Trent)

[85] THE NORTHERN SIERRA OF PERU: RECENT RESEARCH AND NEW INTERPRETATIONS

Traditionally neglected by archaeologists, the northern highlands of Peru have seen considerable research in the last few years. This paper reviews the new information about the indigenous cultures of the area and the kinds of ceremonial and political complexity found in the archaeological record there. The strong linkages between the northern sierra and other highland areas are discussed, as are the weaker ties between sierra and coast.

Topic, T. (see Topic, J.) [85]

Topic, Teresa and John Topic (Trent)

[48] MORTUARY STRUCTURES AND BURIAL PATTERNS IN HUAMACHUCO

A variety of burial patterns has been documented for the sites of Marcahuamachuco and Cerro Amaru in the northern sierra of Peru between A.D. 400 and 1000. Individuals were interred in monuments of high visibility, in more ordinary mausoleums, and in caves. Secondary burials were common in the walls of structures interpreted as halls dedicated to celebration of the ancestors. Some patterns appear to emphasize lineage affiliation, while others honour specific individuals—probably putative lineage founders. The relationship between burial patterns and socio-political organization is explored.

Towner, Ronald (Arizona)

[103] THE PUEBLITO PHENOMENON: A NEW PERSPECTIVE ON POST-REVOLT NAVAJO CULTURE

Pueblos are small masonry structures built in defensive locations throughout the Navajo territory of the 18th century. Pueblo construction began after the Spanish Reconquest of New Mexico in AD 1692 and has been used as evidence of a massive immigration of Pueblo Refugees that dramatically changed Navajo culture. This paper examines the entire Pueblo phenomenon from a temporal and geographic perspective. Results indicate that these structures are temporally unrelated to the Spanish Reconquest and geographically distant from areas of Spanish influence. Explanations for the appearance of pueblos and implications for the study of early Navajo culture are offered.

Trask, Lance, and Garth Bawden (Maxwell Museum of Anthropology)

[38] THE SOCIAL GEOGRAPHY OF PETROGLYPHS AND PICTOGRAPHS

The results of a recent project in the Jemez Mountains of New Mexico, employing new survey and data collection methods, allow the interpretation of "rock art" as active and group-specific symbolism. Through a precise study of their physical and historical contexts the symbols can be ascribed to three major classes of religious and social meaning of a specific Rio Grande Puebloan group. In this paper we discuss the theoretical and methodological components of this project, present the contextual data within which the art possesses meaning and offer preliminary conclusions as to its social relevance, both past and present.

Tratebas, Alice (Bureau of Land Management)

[38] CULTURAL CONTINUITY IN PALEO-INDIAN AND ARCHAIC PETROGLYPHS

Petroglyphs in the Black Hills that depict hunting related themes have been viewed as a single style. Cation-ratio and accelerator C14 dates demonstrate that they span approximately 9000 years, beginning during Clovis times. Some themes depicted indicate longer term cultural continuity than expected. An attribute analysis, however, demonstrates several major temporal changes. The use of common archaeological techniques, such as attribute analyses, provides greater descriptive and explanatory power than the subjectively defined styles generally used in rock art studies.

Tierweiler, W. Nicholas and Meredith Matthews

[1] TEMPORAL CHANGES IN THE PREHISTORIC SELECTION OF NATURAL RESOURCES: EXCAVATED BIOTIC MATERIALS FROM BANDELIER NATIONAL MONUMENT

The results of macrobotanical and faunal analyses are reported from recent excavations at several Pueblo period habitation sites within Bandelier National Monument, New Mexico. Macrobotanical data are compiled and diversity and ubiquity indices are used to illustrate temporal differences in the utilization of prehistoric botanical resources. Faunal data are also reported, and a net caloric approach is used to demonstrate temporal change in resource selection. Finally, the results of the macrobotanical and faunal analyses are used to critically examine a model of population aggregation in which the availability of natural biotic resources may be related to intensified agriculture.

Trimble, M. (see Meyers, T.) [92]

Trubowitz, Neal (Missouri Historical Society)

[82] THE OVERLOOKED ANCESTORS: REDISCOVERING THE PIONEER ARCHAEOLOGY COLLECTIONS AT THE MISSOURI HISTORICAL SOCIETY

From 1866 until 1921, the Missouri Historical Society sought archaeological collections of unmatched quality, concentrating on Missouri and the Mississippi Valley, with samples from around the United States. The collections then languished until 1962-1979, when Carl Chapman's students undertook some cataloging and research. Since 1990 the Society has reinvested in its archaeological past. Rehousing some 10,000 objects, including over 600 whole pots, at its new Library and Collections Center, research began on the pioneer archaeology of the Bushnells, Gerard Fowke, and others at Cahokia and elsewhere. The investigations are restoring acquisition information, updating the computerized inventory, and identifying the potential for additional research and renewed exhibition.

Tuck, James (Newfoundland)

[19] HISTORIC ARCHAEOLOGY AND PUBLIC PARTICIPATION IN NEWFOUNDLAND AND LABRADOR

Historic sites archaeology at Red Bay, Labrador and Ferryland, Newfoundland has explored two sites that have, or will, attract a great deal of public attention. This paper describes briefly these two sites, but its main point is what sort of development should take place at such sites. It is suggested that locally-driven development, with a maximum of local participation in all phases of the research and development, is the most effective (cost and otherwise) route to follow in the development of archaeological sites for the benefit of the general public.

Tuck, James (Newfoundland) [Discussant 19]

Turnbow, C. (see Glowacki, D.) [91]

Turner II, B. L. (Clark)

[5] THE BURDEN OF PROOF: THE EVIDENCE FOR WETLAND AGRICULTURE AT PULLTROUSER SWAMP

Controversy has developed over the proper interpretations to be given to wetland agriculture in the ancient Maya lowlands. Two polar positions have emerged: the geocentric and the anthropocentric, each carrying particular biases that result in radically different weightings of the evidence, independent of the interpretations given to it. This paper examines the two positions from previously unreported data from Pulltrouser Swamp, Belize. It details the various data, demonstrating their relevancy for the geocentric and anthropocentric interpretations. The paper concludes that extreme interpretations can only follow from an arbitrary dismissal of some portion of the evidence.

Underhill, Anne (McGill)

[71] THE ROLE OF POTTERY VESSELS IN MORTUARY RITUAL DURING THE LATE NEOLITHIC PERIOD OF CHINA

Pottery vessels are often the most abundant category of goods found in prehistoric cemeteries. However, relatively little attention has been paid to explaining the role of vessels in mortuary ritual. This paper examines morphological and functional classes of vessels placed in late Neolithic graves by considering the importance of eating and drinking in maintaining social relations in chiefdoms and during the early historic period of China. It also examines changes in the quantity and quality of vessels placed in graves over time.

Valdez, F. (see Reese-Taylor, F.) [95]

Valdez, Fred (Texas-Austin) [Discussant 95]

van der Merwe, N. (see Raymond, J.) [93]

Van Zandt, Tineke (National Park Service)

[1] HOUSES MADE OF TUFF: ANASAZI ARCHITECTURE AT BANDELIER NATIONAL MONUMENT

The Bandelier Survey recorded site structure and architectural information for 1736 prehistoric site components. This large sample allows evaluation of the project model of settlement aggregation in the Late Coalition and Early Classic Periods (ca. A.D. 1150-1475). The role played by architecture in the demographic, social, and economic transformations occurring with aggregation is investigated at the levels of the structure, the site, and the community. Multiple lines of evidence for architectural diversity and change are explored, including construction techniques, site size, and site organization.

Varien, Mark (Crow Canyon Archaeological Center) and K. Kuckelman

[83] ABANDONMENT OF STRUCTURES, SITES AND REGIONS: A CASE STUDY FROM THE MESA VERDE REGION

This paper examines relationships of structure, site, and regional abandonment processes in the thirteenth-century American Southwest. Mesa Verde—region abandonment processes are considered in a case study of forty pitstructures from a 225 km² study area. Small mesa-top residential sites were abandoned in the mid A.D. 1200s, and population aggregated into larger settlements. Stratigraphic data indicate that wooden beams were salvaged from small sites, though some small sites were still used seasonally after their pitstructures were destroyed. Construction timbers were destroyed in the abandonment process only when the entire region was abandoned in the A.D. 1280s.

Vasquez, S. (see Curet, L.) [49]

Vazquez, Ricardo (National Museum of Costa Rica)

[53] ANAEROBIC PRESERVATION IN A COASTAL CEMETERY SITE, NICoya GULF, COSTA RICA

Bundle-burial wrappings of rope and barks, and wood artifacts, were found on the tidal zone, Nicoya Gulf, Costa Rica. Bone remains of 28 individuals were recovered. The burials date as early as 500 B.C. The coast where the site is located has tilted as a result of tectonic plates interaction. Currently, the cemetery remains above sea level only during very low tides. The paper discusses burial characteristics, preservation factors, and identifications of the organic materials. Also, remarks on the implications of such finds are presented.

Veltre, D. (see McCartney, A.) [19]

Vento, Frank (Clarion Univ. of Pennsylvania) and Harold Rollins (Pittsburgh)

[17] GENETIC STRATIGRAPHY, CLIMATE CHANGE AND PALEOSOL DEVELOPMENT WITHIN THE SUSQUEHANNA RIVER DRAINAGE BASIN

The primary goal of genetic stratigraphy is the development of a high resolution chronostratigraphic framework which enhance predictive stratigraphy. Paleosols on low terrace contexts within the Susquehanna basin are ideal basic genetic units for establishing a chronostratigraphic framework. Because they reflect extensive temporal stability, paleosols, in general are alloigenic genetic units traceable over considerable distances. Tentative connections between buried A-horizons and region-wide environmental conditions have been suggested but never formalized into a comprehensive framework. The concept of genetic stratigraphy provides a means of evaluating this patterning of and distinguishing between local and regional variability in sedimentary records.

Vickery, K. (see Litfin, J.) [91]

Vierra, Bradley (New Mexico)

[34] SUBSISTENCE DIVERSIFICATION AND MESOLITHIC TECHNOLOGY

This paper will evaluate one possible explanation for long-term changes in stone tool technology—that of subsistence diversification, and how well this explanation accounts for changes in Portuguese Mesolithic technology. A model describing the possible relationships between shifts in foraging strategies, foraging tactics, and technology is discussed. The archeological implications of the model are presented in terms of tool design, raw material procurement, tool production, tool use, and tool discard patterns. These predictions are then evaluated on a series of early and late Mesolithic lithic assemblages.

Vint, James

[1] SHERDS AND THE SOCIAL MILIEU OF BANDELIER NATIONAL MONUMENT

Ceramics recorded during the Bandelier Survey span the era of ca. A.D. 1100-1600. This analysis focuses on functional, spatial, and temporal variability in ceramic assemblages during the park's most intensive occupations—the Late Coalition and Early Classic Periods, A.D. 1150-1475. The data are based on traditional types and vessel forms, augmented by limited compositional analyses.

Observed changes through time in assemblage distributions across the park (typological and functional) are used to test implications of the project model for aggregation, particularly the nature and rate of change in social interaction (exchange, social boundaries) and population movement on the Pajarito Plateau.

Vitelli, Karen (Indiana)

[104] POTS, POTTERS AND SOCIETY IN NEOLITHIC GREECE AND THE EASTERN MEDITERRANEAN

The Neolithic ceramics from Greece suggest that in the early phases of the Neolithic a small number of specialist women potters, using highly risky (not economical or safe) procedures, produced the usually small, elegantly shaped and/or decorated vessels. The products suggest a ceremonial function. Cooking pots are late-comers. A model of household production for utilitarian needs is unsupportable until the final stage of the Neolithic. These ceramic changes reflect larger social and economic changes. The model is tested with evidence from elsewhere in the Eastern Mediterranean.

Vivian, Richard (Arizona)

[41] DEFINING A CHACOAN REGIONAL SYSTEM THROUGH COMMUNITY ARCHITECTURE

Chacoan culture has and continues to be defined largely in terms of architecture. The methodological and conceptual transition from study of single buildings or building types to analysis of Chacoan "communities" in the past two decades has resulted in increasingly divergent definitions of the size and nature of a Chacoan regional system. This process and the implications for the concept of a Chacoan regional system are discussed.

von Nagy, Christopher (Tulane)

[49] THE PAJONAL PROJECT: RECENT ARCHAEOLOGICAL INVESTIGATIONS IN THE AHUALULCOS REGION OF TABASCO

This paper presents the results to date of two seasons of fieldwork in western Tabasco. The research focuses on a 275 square kilometer area encompassing two extinct, superimposed distribution channel systems and associated remains of the ancient deltaic communities that linked them. Survey, excavation, geological core and other data suggest several major periods of settlement—an Early through Middle Preclassic component of Olmec villages associated with the earliest channel, a Middle through Late Classic series of linear communities associated with the second channel, and a Late Postclassic/Hispanic horizon associated with the historic Ahualulcos.

Voytek, Barbara (California)

[111] GROTTA DELL'EDERA IN THE PREHISTORIC CONTEXT OF THE NORTH ADRIATIC

Grotta dell'Edera in the Prehistoric Context of the North Adriatic. The site of Grotta dell'Edera, located in the Trieste karst, is presented in this research report within the larger framework of the prehistory of the Northern Adriatic. Testing of the cave has exposed four meters of cultural deposits. The report focusses on the current season, the objective of which is the integration of the neolithic layers with recent studies of regional open air sites.

Vradenburg, Joseph and Sara Meadors (Missouri-Columbia)

[9] CARDAL: THE EFFECTS OF DIET, DISEASE, AND HEALTH ON A LATE INITIAL PERIOD POPULATION

Cardal is located in the lower Lurin Valley, Peru. During excavation, Richard Burger recovered 43 individuals contemporaneous with the site's occupation. Age specific periods of stress and sexual differences in diet and health were observed. Cranial deformation suggests a stratified society, and other bio-indicators support this conclusion. Changing diet, high levels of generalized stress, and disease suggest a deterioration of community health during the late (1150-800 B.C.) Initial Period, probably contributing to site abandonment.

Wagner, Curly Bear (Blackfeet Nation)

[3] NORTHWESTERN PLAINS SACRED SITES: A BLACKFEET PERSPECTIVE

Many places in the traditional homeland of the Blackfeet People are sacred. Among the most important are Chief Mountain and the Sweetgrass Hills. At one time both of these places were on the Blackfeet Reservation. Now only part of Chief is within our land. Our traditional religious practices at these places are being affected by mining, timbering and tourists. Most federal agencies do not, in our view, take our concerns properly into account when developing policies and plans for these places.

Wagner, Erika (IVIC)

[60] RECENT RESEARCH IN EASTERN VENEZUELA, THE LLANOS AND THE PIEDMONT AREA

After Rouse's and Cruxent's valuable pioneer culture historical synthesis of Venezuelan archaeology, and Sanjoa and Vargas' compilation, using a mechanical Marxist approach with basically the

same data base, research during the last 25 years has focused mainly on the Orinoco Basin and Northwestern Venezuela. New models to interpret the country's prehistory combine archaeology, linguistics and ethnohistory. More recently, long term regional projects are producing new insights. Eastern Venezuela and the Llanos (plains) have so far been neglected. This paper also addresses the importance of another long-overlooked region, the "Eastern Andean Piedmont Area," (Pie del Monte), where research in the high Llanos and the Barinas piedmont region has revealed the appearance of chiefdoms, intensive agriculture and complex earth-works.

Wagner, Mark (American Resources Group)

[99] ARCHAEOLOGICAL INVESTIGATIONS AT THREE MID-NINETEENTH CENTURY FARMSTEADS IN SHAWNEE COUNTY, KANSAS

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 teachers 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 conditions-institutional and cultural-that influence their including archaeology.

Walker, L. (see Minor, R.) [92]

Walker, William (Arizona)

[83] PUEBLOAN WITCHCRAFT AND THE ARCHAEOLOGY OF VIOLENCE

This paper proposes a behavioral methodology for recognizing and explaining ritually mutilated and burned bodies encountered in prehistoric pueblo sites. The category of Krataphonous deposits is proposed to describe depositional behaviors that result from ritual violence such as the persecution and destruction of witches. Ceremonial rooms containing bodies from the late prehistoric pueblo of Homol'ovi II are discussed in light of a larger set of analogous deposits in other pueblo sites. By refocusing previous discussions of cannibalism and conflict within a dynamic context such as witchcraft accusation, these deposits become analytically useful for studying processes of prehistoric change.

Wall, R. (see Botwick, B.) [40]

Wallace, Henry, William Doelle and James Heidke (Desert Archaeology)

[83] HOHOKAM ORIGINS

The origin, dispersal, and dating of the Hohokam cultural tradition in southern Arizona is the focus of this paper. We examine new evidence from rock art and ceramic iconography and from an extensive reappraisal of the absolute and ceramic cross-dating evidence for the region, including data from recently excavated early ceramic horizon sites. Evidence that what had been perceived as gradual region-wide culture change actually occurred very rapidly and originated in the Phoenix Basin is presented together with possible interpretations of the significance of these changes.

Wandsnider, LuAnn (Nebraska-Lincoln)

[56] NOMADIC SHEEP-GOAT PASTORALISM AND ARCHAEOLOGICAL LANDSCAPES

Pastoralists create a cultural landscape variably rich in facilities and artifacts. This variation reflects both the anticipated and realized economic organization of labor, animals, and forage through time and across space. Here, variation in nomadic sheep-goat pastoralism is the focus. Its variable ecological context as ethnographically documented in the Americas, Asia, and Africa is considered as is the attendant variation in frequency, geographic stability, and scheduling in place use. Finally, the archaeological consequences of this economic variation, discussed in terms of remnant settlement patterns, are examined.

Warburton, Miranda (NNAD-NAU)

[103] THE CULTURAL LANDSCAPE OF THE NAVAJO NEW LANDS, ARIZONA

The relocation of thousands of Navajo people from the "Former Joint Use Area" into the planned communities of eastern Arizona's Navajo New Lands nears completion. This planned cultural landscape, crafted by the Office of Navajo and Hopi Indian Relocation, inhabited by "relocatees" now exhibits a superimposed pattern of native land use. The current cultural landscape of the "New Lands" represents a syncretism of bureaucratic planning and Navajo practical land use. This pattern provides a vehicle for ascertaining which elements of traditional land use and architecture are crucial to Navajo ethnic identity in a situation of forced acculturation.

Warren, Claude (Neveda)

[58] CHANGE AND CONTINUITY IN THE EARLY ARCHAIC OF THE SAN DIEGO COAST

The Early Archaic (La Jolla) tool assemblage and faunal remains reflect an economic pattern with an emphasis on collecting activities including the processing of hard seeds and the collecting of

shellfish, while evidence of hunting activities is rare. This subsistence pattern continues for 6000 years in face of monumental reduction of shellfish resources. A model explaining the cultural conservatism of the La Jolla subsistence pattern is presented.

Warren, Robert (Illinois State Museum)

[55] LATE QUATERNARY FRESHWATER MUSSEL POPULATIONS IN THE CENTRAL MISSISSIPPI RIVER VALLEY

Historically, the Mississippi River basin housed the most diverse fauna of freshwater mussels (Mollusca: Bivalvia: Unionoidea) in the world. Assemblages of mussel shell from geological and archaeological sites in the central Mississippi Valley document significant changes in the diversity and species composition of mussel communities during late-Pleistocene and Holocene times. These changes are probably related to late-glacial and postglacial climatic changes in the Mississippi Basin, as well as changes in the paleoecology, hydrology, and sedimentary environments of the Mississippi River and its tributary streams. Dynamics of the mussel fauna have important implications for the human exploitation of this resource.

Waters, Michael

[72] THE ROLE OF GEOARCHAEOLOGY IN ARCHAEOLOGICAL RESEARCH

Geoarchaeology is the field of study that applies the concepts and methods of the geosciences to archaeological research. Geoarchaeological studies can (1) establish the stratigraphic and temporal framework of a site; (2) provide an understanding of the effects of geological processes on the formation of the archaeological record; and (3) furnish a reconstruction of the prehistoric landscape setting of a site to understand human-land interactions. Geoarchaeological studies are an indispensable part of modern archaeological research which enhances the interpretation of archaeological data and our understanding of human prehistory.

Watters, D. (see Scaglion, R.) [79]

Watters, David (Carnegie Museum of Natural History)

[79] FIELD METHODS AND CHRONOLOGY AT TRANTS, MONTSERRAT

This paper compares field methods used in 1978-79 and 1990 at Trants. Total site area and the "core area," both of which had been under-estimated during initial research, were clarified by new field methods in 1990. Of several systematic surface collection strategies used, the "collection corridor" (consisting of 10 x 10 m squares crossing the site) was most effective. Test pits excavated at set intervals within those corridors allowed comparison of surface and subsurface artifact densities. Diagnostic artifacts and eight radiocarbon dates indicate occupation during the early and middle portions of the Salado period.

Webb, E. (see Rindos, D.) [39]

Webb, Esme (Australia)

[28] IS COMPLEXITY A NECESSARY FEATURE OF HUNTER-GATHERER SOCIO-ECONOMICS?

Several cultural changes appear to have occurred in the Australian archaeological record about 4000BP. A marked technological shift, the introduction of small tools frequently made on blades, was apparently synchronous with the preservation of sites indicative of greater populations, longer occupation or increased extractive capacity. The reasons for this apparent 'intensification' are hotly debated. It is argued here that 'intensification' was the optimal human response to the extreme variance and unpredictability of the Australian environment and that it occurred repeatedly. Such complexity is an integral feature of the human capacity for cultural adaptation.

Weber, Andrzej (Alberta)

[28] BONE CHEMISTRY, DIAGENESIS, CLEANING TECHNIQUES AND INTERPRETATION: SOME METHODOLOGICAL CONSIDERATIONS

Ten human bones from Neolithic sites in Siberia were divided into three segments and treated differently prior to elemental determinations: (A) brushing and rinsing, (B) treatment A plus mechanical cleaning, and (C) treatment B plus chemical cleaning. Behaviours of individual elements, multi-element correlations, and Ca/P ratio were analysed to monitor diagenesis after each treatment. Results revealed that most of the analyzed elements were affected by diagenesis. Applied cleaning dealt successfully with contamination. Diagenesis on each investigated site should be examined in a similar experiment. Simple application of mechanical and chemical cleaning will not ensure that the data for dietary interpretations are reliable.

Weber, Ronald (*Field Museum of Natural History*)

[20] ANALYSIS OF HISTORIC COTTON TEXTILES FROM EASTERN PERU AND COMPARISONS WITH ARCHAEOLOGICAL EXAMPLES FROM PERU

Ethnohistoric and archaeological data indicate that cotton textiles are ancient in Eastern Peru, but no examples are known to date before 1850. This paper will discuss present day Shipibo and Conibo techniques of weaving, painting, and dying. Stylistic comparisons will be made with other eastern Peruvian Indians and some discussion and comparisons will be made with cotton textiles from archaeological contexts.

Webster, Ann (*Chicago*)

[12] SHIFTING SPECIES ABUNDANCE PATTERNS AND THE INCREASED USE OF CAMELIDS IN THE TIWANAKU VALLEY, BOLIVIA: FORMATIVE PERIOD TO TIWANAKU V

This paper will address the observed changes in species representation that occurred through time at sites in and near the Tiwanaku Valley, Bolivia. Analysis of the faunal remains has shown that smaller game was the focus of hunting subsistence strategies during the early occupation of the Valley (Formative Period). Thereafter, large mammals (i.e. camelids) dramatically eclipsed small game as the preferred meat source of indigenous human populations. With the later Tiwanaku IV and V periods, camelids were used almost exclusively. Animal husbandry strategies that were employed by the Tiwanakans during the Tiwanaku IV and V periods will be described.

Webster, D. (see Paine, R.) [37]

Wiegand, Phil and David Wilcox (*Arizona*)

[16] CHACOAN CAPITALS: CENTERS OF COMPETING POLITIES

Conventional wisdom has it that Southwestern societies were egalitarian, or at best chiefdoms, and so the idea of comparing Chaco Canyon and Aztec as capitals, as though they were the centers of early states, is innovative. We analyze the evolution of formal arrangements at each, comparing the two to identify similarities and differences, and then examining the resulting model in the context of wider Southwestern and Mesoamerican comparisons. Evidence for the symbolic forms of power as reflected in architectural morphology are repeated in each case.

Weintraub, N. (see Hanson, J.) [2]

Weisler, Marshall (*California-Berkeley*)

[70] INTER-ISLAND EXCHANGE AND THE SETTLEMENT OF TROPICAL POLYNESIA

Long-distance exchange was an important strategy employed by Polynesian colonists for maintaining small founding groups at distant archipelagos. While the frequency and duration of inter-island social interaction influenced island prehistories, documenting the presence of exotic lithic materials—items necessary to identify prehistoric communication between Polynesian archaeological societies—has been difficult without the widespread occurrence of pottery. Using a non-destructive x-ray fluorescence technique, this paper examines the distribution and frequency of finegrained basalt artifacts from three archaeological sites in central and eastern Polynesia. The settlement of tropical Polynesia is discussed in light of this new evidence.

Weiss, Harvey (*Yale*)

[78] ABRUPT CLIMATIC CHANGE AND MESOPOTAMIAN COLLAPSE

The abrupt "desertification and desertion" of northern Mesopotamia ca. 2200 B.C.–1900 B.C. is now securely documented. Causes for the desertification can be outlined. The consequences of the regional desertion included the disruption of pastoral transhumance. A large scale population movement into southern Mesopotamia was another consequence. Effects of the abrupt climatic change also explain the peculiar activities of the Third Dynasty of Ur.

Welch, David (*Int'l Archaeol Research Inst, Inc*)

[71] MOATED SITES AND LATE PREHISTORIC SOCIAL CHANGE IN NORTHEAST THAILAND

The walled and moated sites of northeast Thailand are a prime indicator of late prehistoric changes in social and political organization. These sites provide evidence of increased political complexity, competition, regional integration, agricultural intensification, and social stratification during the period preceding state formation. A study of moated sites in the Phimai region includes the first effort to date directly the construction of the earthworks, an examination of the labor effort required to build them, analysis of their place within a hierarchical settlement system, and interpretation of their possible role in late prehistoric exchange systems.

Welch, Paul (*Queens*)

[102] WHAT WERE PEOPLE DOING AT OUTLYING SITES WITHIN THE MOUNDVILLE CHIEFDOM?

The Moundville chiefdom included not only the multimound center of Moundville itself, but also a number of single-mound sites and farmsteads. Recent excavations at one of the single-mound sites, Hog Pen Hill, provide new information about the role(s) of this kind of settlement in the Moundville economy, but raise new questions about what activities took place at the outlying mounds and how the outlying settlements relate to the populace at Moundville.

Wells, Peter (*Minnesota*)

[77] TRADE AND GROWTH OF LARGE COMMUNITIES IN LATE IRON AGE EUROPE

The largest and most complex settlements of prehistoric Europe were the great walled enclosures of the final two centuries before Christ, called oppida. Both long-distance and regional trade are well represented at these settlements, and commerce may have been a principal factor in their establishment. Ongoing archaeological research at Kelheim on the Danube River in Germany enables us to address the role of trade in the growth of the settlement there. Comparison with contemporaneous settlements in other parts of Europe suggests general relationships between trade and settlement growth in Late Iron Age Europe.

Wenke, Robert (*Washington*) [Discussant 110]

Wesler, Kit (*Murray*)

[22] THE WICKLIFFE MOUNDS CEMETERY: IMPLICATIONS FOR LATE MISSISSIPPI PERIOD CHRONOLOGY, SETTLEMENT AND MORTUARY PATTERNS IN WESTERN KENTUCKY

Excavations in the Wickliffe Mounds cemetery in 1991–92 revealed an unexpected complexity of deposition in Mound C. Stratigraphic relationships indicate that the cemetery is intrusive into the site, and thus post-dates village abandonment circa A.D. 1350. Efforts to trace the full extent of the cemetery were partly successful, and revealed additional complexity in burial pattern: burial density varies, suggesting deliberate clustering within a delimited space. No evidence for a mortuary structure was identified. A scenario of a single chiefly cycle, followed by dispersal of the population with continued use of the site as an "empty" ceremonial center, best fits current data.

West, Frederick (*Peabody and Essex Museum*) [Discussant 19]

Weymouth, J. (see Bleed, P.) [4]

Weymouth, John

[72] MAGNETIC PROSPECTION AS A NON-DESTRUCTIVE TOOL FOR ARCHAEOLOGICAL SITE EVALUATION

Of the various non-destructive tools available for site evaluation proton magnetometry has been one of the most widely used. The site suitability and the advantages and disadvantages of this method will be discussed. The discussion will also include the use of fluxgate gradiometers and comparisons with proton magnetometers. Examples will be drawn from several prehistoric and historic site surveys.

Whallon, Robert (*Michigan*) [Discussant 25]

Wheeler, Charles, Scott Wilcox and David Ayers (*Division of Conserv Archaeology*)

[103] MATERIAL CORRELATES OF EARLY NAVAJO CERMONIALISM

Two Navajo archeological sites have been excavated within a limited portion of the Gobernador Canyon area. Gobernador Canyon is part of the traditional Navajo homeland known as Dinetah. These sites contain evidence of ceremonial behavior. The evidence includes one internal feature indicative of dry painting and one effigy. Dates range from the Dinetah through the Gobernador phases. Archaeological methods in concert with ethnographically derived information provide a basis for interpretation of these cultural remains in the context of Navajo culture.

White, Christine (*Western Ontario*), Paul Healy (*Trent*) and Henry Schwarcz (*McMaster*)

[37] INTENSIVE AGRICULTURE, SOCIAL STATUS, AND MAYA DIET AT PACBITUN, BELIZE

Stable isotope ratios are analyzed on bone collagen of 34 individuals from the ancient Maya site of Pacbitun to determine possible associations between diet, social status (indicated by core zone vs. periphery burials, burial wealth, etc.), and shifts in agricultural practices. In addition, the environmental distinction of the site makes it an interesting comparison with previously studied sites of Copan and Lamani.

White, Joyce (Pennsylvania)

[76] INDIGENOUS LANDSCAPE CLASSIFICATION AND THE DEVELOPMENT OF EARLY RICE AGRICULTURE IN THAILAND

Archaeologists working in Thailand expected the settlement pattern of early agricultural villages to be oriented toward soils appropriate for either swidden or wet rice cultivation. However, these sites dating to the 2nd and 3rd millennium B.C. are not found near soils considered most suitable for either dry or wet rice cultivation. Ethnoecological research revealed an indigenous landscape classification system that is more differentiated than scientific schemes. The indigenous system refines our understanding of the distribution of the early farming settlements relative to natural resources, and provides a basis for a new model for the development of early rice agriculture.

White, Karli (Illinois) and Bonnie Styles

[91] FORT ANCIENT FAUNAL EXPLOITATION AT THE MADISONVILLE SITE

The analysis of faunal remains from recent excavations at the Madisonville site reveals a typical Fort Ancient assemblage with an abundance of white-tailed deer and turkey followed by medium and small sized mammals. The large quantity and excellent preservation of remains from white-tailed deer permit an assessment of the economic importance of deer at Madisonville. Analysis of deer body part representation facilitates evaluation of potential density-mediated destruction of deer bone and transport of meat to or from the site.

White, Nancy (South Florida) and Richard Estabrook (Janus Research/Piper Archaeology)

[98] LATE ARCHAIC SHELL MOUND COMPONENTS IN THE APALACHICOLA DELTA WETLANDS, NORTHWEST FLORIDA

Deeply stratified levels in Rangia shell mounds in the lower Apalachicola Valley estuary/river swamp contain 3000-4000-year-old Late Archaic deposits with plain and simple-stamped fiber-tempered ceramics, clay balls, and microtools and cores. Relationships with Elliott's Point/Poverty Point adaptations along the Gulf Coast and up the Mississippi are suggested, especially by the lithic assemblages. The fiber in the ceramics is identified as Spanish moss. On the east side of the delta the Late Archaic materials are in an oyster shell matrix, suggesting a difference in environmental salinity associated with a different fluvial history.

Whitelaw, Todd

[7] PUTTING TOGETHER THE PIECES; SOCIAL AND SYMBOLIC ORGANIZATION IN HUNTER-GATHERER SITE STRUCTURE

Ethnoarchaeological and archaeological site structural studies provide a systematic framework for describing and explaining, at a mechanical level, activity areas and the small-scale spatial patterning of debris on occupation sites. They are less able to cope with overall site patterning, in terms of the relationships between different activity areas, precisely because site structural approaches have tried to circumvent the inherent difficulties of dealing with the social and symbolic meaning of spatial relations within past societies. The significance of these factors is addressed through ethnographic data, and a generalising approach toward the development of archeological theory is pursued.

Whitridge, Peter (Arizona)

[11] THE SPATIAL ANALYSIS OF THULE WHALE BONE DISTRIBUTIONS: A CASE STUDY FROM THE CENTRAL CANADIAN ARCTIC

Poorly understood carcass butchery and bone transport criteria, and a high degree of whale bone use and reduction even centuries after the animal's death, have long hindered zooarchaeological assessments of the contribution of bowhead whales to Thule Eskimo subsistence economies. Thorough plotting of whale bone distributions in the vicinity of Thule settlements now allows formal quantification of inter- and intrasite associations between various element and feature types. The benefits of this approach are illustrated by a local density analysis of extensive surface bone scatters recently recorded on Somerset Island, Northwest Territories.

Whittaker, Fran (Washington)

[22] LOWLAND ADAPTATION DURING THE LATE ARCHAIC IN THE CENTRAL MISSISSIPPI RIVER VALLEY

Swampy lowland environments were heavily utilized by humans living in the middle and lower Mississippi Valley during the Late Archaic (approximately 5000-3000 BP). Little documentation of this exists in the current literature. Current research in the Little River Lowland of Southeast Missouri is ongoing to sort out and document the rich variability of the record for this time period. Spatial distributions, site formation data and chronological sorting by fluorine dating all provide clues to the land use and subsistence activities of the lowland focused Late Archaic. Analyses of a group of sites from three counties will be presented.

Whittington, Stephen (Maine) and David Reed (Penn State)

[13] PRELIMINARY RESULTS OF ANALYSIS OF HUMAN SKELETAL REMAINS FROM IXIMCHE, GUATEMALA

Ongoing analysis of human bones and associated artifacts is revealing details of the Late Postclassic/Contact period at Iximche, Guatemala, a highland Cakchiquel/Spanish site. Decapitations studied so far resulted from pre-Conquest sacrifices, not Spanish actions. Although no evidence of damage to Cakchiquel bones from metal weapons has been encountered, undoubtedly European artifacts found with bones amplify the meager archaeological evidence of Spanish presence published by Guillamin. Frequencies of paleopathological indicators of stress are clarifying the social status of individuals and stable isotope analysis is allowing dietary reconstruction.

Whyte, Thomas (Appalachian)

[45] PREHISTORIC TOAD-LICKING IN THE SOUTHERN APPALACHIANS? I DON'T THINK SO!

One large pit feature on a late prehistoric village site in western North Carolina yielded thousands of bones of toads (genus *Bufo*), suggesting to one analyst that "these animals were deliberately exploited, possibly for use as a medicinal or hallucinogenic agent." Recent experimental entrapment data and naturalistic observations of toad breeding, however, strongly argue for a natural accumulation of these remains in the feature.

Wiant, Michael (Illinois State Museum)

[43] GEOLOGICAL CONTEXT AND INVESTIGATIVE STRATEGY AT NAPOLEAN HOLLOW

Archaeologists too often rely on surface artifact distributions without regard for geological context. This study compares a hypothetical excavation strategy based on surface artifacts with one implemented to establish geological context and target artifact-bearing deposits. Napoleon Hollow consists of stratified fluvial and colluvial deposits. Mechanical and manual means of documenting deposits met with varying degrees of success. Five distinct artifact-bearing deposits, four of which without surface manifestations, crosscut geological facies and are not consistently superimposed, underscoring the imperative of establishing geological context prior to archaeological investigation.

Wiant, Michael (Illinois State Museum) and Kenneth Barr (US Army Corps of Engineers

[92] A GIS-BASED CULTURAL RESOURCE FILE FOR THE UPPER MISSISSIPPI RIVER NAVIGATION STUDY

A Geographic Information System (GIS) is an unprecedented management and research tool. The Illinois State Museum has created a GIS-based cultural resource file which includes tabular and graphic information on prehistoric and historical archaeological deposits, architecture, plat maps, land purchase, and cemeteries. With the U.S. Army Corps of Engineers, Rock Island District, Museum GIS specialists have created a GIS-based cultural resource file for that part of the Upper Mississippi River Navigation Study area managed by the District. The file includes information from Illinois, Wisconsin, Iowa, and Missouri and operates on a SUN workstation. This application bolsters the Corps' management and planning capacity.

Widmer, Randolph (Houston)

[37] OBSIDIAN USE-WEAR PATTERNS AND CRAFT ACTIVITIES AT THE CLASSIC MAYA SITE OF COPAN

Low power microscopic examination of over 2600 obsidian blades from 103 final phase proveniences from the Late Classic site of 9N-8, Patio H, Copan, reveal multiple and varied use-wear patterns on the blade edges. This patio contains lapidary and costume workshops. Analysis reveals the the obsidian blade industry was involved in craft activities. These findings concur with other lines of evidence that suggest that most of the craft workshops also functioned as domiciles.

Wiessner, Polly (Max Planck Institute for Humane Theologie)

[76] THE INTRODUCTION OF THE SWEET POTATO AND ITS IMPACT ON SETTLEMENT PATTERNS AND EXCHANGE AMONG THE ENGA OF HIGHLAND PAPUA NEW GUINEA

The sweet potato was introduced into Enga Province in Papua New Guinea approximately 200 years before contact with Europeans, releasing many constraints on agriculture. The effect was rapid population increase and subsequent dispersal to colonize many fringe areas. Based on the oral history of 100 Enga tribes the following trends will be examined

- 1 Patterns of population dispersal and resettlement after the introduction of a major resource.
- 2 The means by which exchange networks maintained/ reestablished with populations in the central valleys.

Wilcox, D. (see Wiegand, P.) [16]

Wilcox, S. (see Wheeler, C.) [103]

Wilkinson, Tony (Chicago)

[76] LAND USE ZONES AND SETTLEMENT SIZE IN THE JAZIRA REGION OF TURKEY, SYRIA AND IRAQ

Land use mapping of modern agricultural systems in the area of Kurban Hoyuk on the Turkish Euphrates near Urfa, indicates the extent to which the modern agrarian economy is geared towards crop production for trade and export. This can be contrasted with results of field studies of Late Roman and Early Bronze Age land use -settlement systems that show high and moderate intensity cultivation systems were practiced over more limited areas. Although there may have been some localised export or exchange of grain or lentils, the model that best fits the field evidence is that which requires each settlement or settlement-system to produce just sufficient goods for its needs.

Applying such an equilibrium model to Chalcolithic and Bronze Age settlement systems in the dry-farming zone of Syria and Iraq it is possible to examine the relationship between measured archaeological land use zones and the size of central settlements. Beyond this, settlement-land use models can be generated that show how settlement hierarchies and catchment production can rise in tandem to replicate classic central-place type systems.

Williams, J. (see Holley, G.) [106]

Williams, Stephen [Discussant 63]

Williams, Stephen [Discussant 47]

Williams, Verónica (Universidad de Buenos Aires)

[105] ARCHITECTURE AND SETTLEMENT ORGANIZATION IN INKA-PERIOD SITES IN THE CALCHAQUI VALLEY

Inka-period settlements of the Calchaqui Valley exhibit two basic variations. The Inka sites Cortaderas and Corral Blanco contain a central compound of 19 structures, and passages, circular structures, usnus, kallankas, and supporting walls. The architecture, which required no leveling or foundations, consists of double-faced pirkas with trimmed rocks. The site Guitian contains Santamariana and purely Inka sectors. The first comprises semisubterranean conglomerate compounds with levelled surfaces, and subrectangular compounds defined by vertically planted stones. Unlike the intrusive Inka buildings, many santamariana structures have thick double exterior walls that form passages, but exhibit no trimmed rock.

Willis, John (Northwestern)

[96] THE ZIMMERMAN SITE: THE EARLY HISTORIC COMPONENT

A program of systematic investigation was begun in 1991 at the Zimmerman site [11 Ls 13] as part of the Northwestern University archaeological field school. The program was continued in 1992 by Northwestern University as a combined project with Indiana University-Purdue University at Fort Wayne. Excavations during these two field seasons have focused on Midwestern subsistence-settlement systems development. This paper is an overview of what is known to archaeologists about the early historic occupation of the Zimmerman site through prior excavations and an attempt to relate this information to the data obtained during the last two field seasons.

Wilson, Curtis (Alaska)

[46] NINETEENTH-CENTURY CULTURAL RELATIONS ON THE ARCTIC COAST OF ALASKA AND NORTHWESTERN CANADA

This paper focuses on relations between native residents of the Arctic coast and Euroamericans. It examines the history of these relations and aspects of native culture that facilitated easy acceptance of Euroamerican trade goods and other material culture. An existing native trade network and an ideology that joined political power to control of material goods encouraged residents to enter into interaction with the foreign culture with tragic results. In pursuing their perceived self interest, natives willingly participated in a system of relations that led to the deaths of many and the near destruction of the culture of those who remained.

Wilson, David (Southern Methodist)

[62] ASSESSING THE INCA PRESENCE ON THE PERUVIAN NORTH COAST: MOCHE TO CASMA VALLEYS

Inca pottery and architectural diagnostics found on sites and ancient roads from the Moche to the Casma Valleys supports the assertion that the Inca state was present in this area of the north coast. However, the numbers of such remains are so limited as to be nearly nonexistent. Based on

comprehensive settlement pattern surveys carried out by the author of the Santa and Casma Valleys, and of intervalley desert roads and roadside sites between Moche and Casma, this paper examines the dual problems of crediting archaeological remains to the Inca and of assessing the nature of state influence here.

Wilson, Samuel (Texas)

[60] 25 YEARS OF ARCHAEOLOGICAL AND ETHNOHISTORICAL RESEARCH IN THE LESSER ANTILLES

In the Caribbean, as in most places in the Americas, the last 25 years have seen enormous growth in the numbers of archaeological and ethnohistorical projects undertaken. The paper examines this increase in research, paying particular attention to the nature of the problems addressed, and to the models and theories employed in interpretation. The wider social and historical context of this research is considered, but the paper's more general aim is to assess in broad terms what has been done in the recent past, and to provide some commentary on the possible futures of archaeological research in the Lesser Antilles.

Wilson, Sherrill

[44] UNEARTHING COLONIAL BLACK HISTORY IN NEW YORK CITY: THE PROCESS AND THE PRODUCTS

The presentation will focus on providing a historical context for African slaves, and free people in 18th century New York. The recent excavation of an African Burial Ground which was in use from 1712 through 1795 in downtown New York City has unearthed an interest and need to understand what life was like by a discriminated against portion of New York's early labor force.

The multiple problems regarding sensitivity to the public concerns and the varying perspectives from social scientists involving in the research will be highlighted in the presentation.

Wise, Karen (Natural Hist Museum of LA County) and Sonia Guillen

[12] WHEN IS A MUMMY: CHINCHORRO IN SOUTHERN PERU

Elaborate mortuary treatment including evisceration of bodies, replacement of limb bones with vegetation, and the use of clay masks appears by 8000 B.P. in the coastal south-central Andes. The varied mortuary treatment that characterizes the Chinchorro complex is well documented from northern Chile, where extraordinary preservative conditions preserve mummies intact. In southern Peru, preservation is not as good, but features such as position of burials, cemetery organization, and tomb characteristics are diagnostic of the Chinchorro complex. Indications of other characteristics, including wrappings, burning, and other features, reveal the potential for studying Chinchorro burials even when preservation is poor.

Wolforth, Thomas (Illinois Hist Preservation Agency)

[96] THE STEUBEN PHASE: DEFINITION OF A LATE MIDDLE WOODLAND PHASE IN NORTHERN ILLINOIS AND SOUTHERN WISCONSIN

Attempts at defining the later Middle Woodland expression in the northern portion of the Havana Tradition have been vague and offer conflicting suggestions for the material expression, geographic distribution and temporal span of such a unit. In this paper, a reexamination of the relevant literature has resulted in a formal definition of the Steuben Phase. Steuben Phase sites are located in a large area covering the Upper Illinois and Rock Rivers and are distinctly different from Late Woodland Period sites.

Woltanski, Theresa (Tennessee)

[51] EXPERIMENTATION AND ANALYSIS OF HEAT-ALTERED BONE

Actualistic studies utilizing bone can contribute to an understanding of cultural modification of archaeologically recovered bone. Two such cultural modifications include cooking and subsequent fracturing during food preparation. In an effort to understand the fracture dynamics of cooked bone, a three part study was undertaken. This study included mechanical stress testing of bone, hand-fracturing with study of macroscopic fracture details, and microscopic examination of surface morphology using SEM. Results of this study are discussed with special attention to mechanical characteristics of cooked and fresh bone, and micromorphology of fractured surfaces. Implications for the archaeological record are suggested.

Woods, William (Illinois-Eduardsville) and Edwin Hajic (Illinois State Museum)

[106] THE ARCHAEOLOGICAL SIGNIFICANCE OF RECENT GEOMORPHOLOGICAL INVESTIGATIONS IN THE NORTHERN AMERICAN BOTTOM

Over the past decade a number of studies linking archaeology and geomorphology have occurred in the Cahokia Creek and Wood River drainages of the northern American Bottom. These have been directed toward site prospection and interpretation and the development of a geomorphologic model

for the landscape evolution of the local region's alluvial fan, terrace, and floodplain settings. This ongoing research and its relationship to the archaeology of the area is discussed.

Workman, W. (see McCartney, A.) [19]

Wright, Melanie (Minnesota)

[12] SOCIAL AND SPATIAL DIFFERENTIATION AT TIWANAKU: THE EVIDENCE OF THE BOTANICAL REMAINS

This paper will present data from paleoethnobotanical analyses of flotation samples from recent excavations at the Middle Horizon urban center of Tiwanaku in highland Bolivia. Information provided by the botanical remains, both in terms of species composition and spatial distribution, will be applied to the larger question of the nature of social difference at this important political center. Systematically recovered remains from several domestic areas within the urban core will be compared, and inter- and intra-area similarities and differences assessed in light of relevant social theory.

Wright, P. (see Harl, J.) [106]

Wurtzburg, Susan (Louisiana State)

[67] CHITINACHA ARCHAEOLOGY: UNLOCKING THE PAST

The Chitimacha of South Central Louisiana occupied an extensive territory west of the lower Mississippi river at European contact. Despite their territorial extent, reasonably well-documented interactions with French settlers, and archaeological investigations at several sites attributable to them, the Chitimacha past is still all but unknown. This paper presents an analysis of the archival, linguistic, historical, and archaeological sources towards reconstruction of Chitimacha late prehistory and early contact.

Yaeger, Jason (Pennsylvania) and Wendy Ashmore (Pennsylvania)

[75] XUNANTUNICH AT THE END OF THE CLASSIC: DYNAMICS OF SETTLEMENT IN A TIME OF CRISIS

The Maya center of Xunantunich, Belize, enjoyed a relatively brief florescence in the 8th-10th centuries AD, on the eve of the Classic collapse. Settlement research in the vicinity, begun in 1992, emphasizes three goals: (1) documenting the size, distribution, and organizational structure of local population before, during, and after the center's florescence; (2) identifying the impact of presumed sociopolitical upheavals on this population; and (3) testing the applicability of several recent political and economic models for Maya settlement. This paper briefly presents the models addressed, research design followed, and preliminary results of field research in 1992-1993.

Yerkes, Richard (Ohio)

[52] THE PRODUCTION AND EXCHANGE OF HOPEWELL BIFACES AND BLADELETS: NEW EVIDENCE FROM THE FLINT RIDGE QUARRIES, OHIO

The results of the OSU Investigations at the Flint Ridge Quarries (Ohio) are summarized. Data were obtained through remote sensing, surface collection, and test excavation during 1987 and 1988. Geochemical studies, mass analysis, and replicative technological analysis of more than 170,000 rock samples and lithic artifacts were carried out to (1) study the geologic context of Flint Ridge flint, (2) develop a method of distinguishing Flint Ridge flint from similar-looking cherts, and (3) reconstruct the lithic production and exchange systems that were employed to extract the flint and produce and distribute chipped stone artifacts within the "Hopewell Interaction Sphere."

Yohe, Robert (see Sutton, M.) [58]

Yourd, W. (see Shane, O.) [108]

Zampetti, D. (see Mussi, M.) [25]

Zarins, Juris (Southwest Missouri)

[110] PASTORAL NOMADISM AND THE GALENA TRADE: A MIDDLE KINGDOM EGYPTIAN EXAMPLE

Galena [lead sulphide] occurs in deposits along the Egyptian Red Sea. The Egyptian Eastern Desert was controlled by pastoral nomads and thus they controlled the trade of galena for Nile Valley populations. The location of galena sources can be studied by isotope analysis which in turn can provide geographical locations for Middle Kingdom pastoral groups located in the Egyptian Eastern Desert. The best example for study comes from the Beni Hasan tombs of the early second millennium B.C.

Zeidler, James (Illinois-Urbana)

[36] SITE DISCOVERY AND SAMPLING BIAS IN THE NEOTROPICS

This paper discusses methodological and logistical problems involved in regional archaeological surveys of humid neotropical landscapes characterized by minimal surface visibility and low accessibility.

ity. In a case study from the western Ecuadorian lowlands, site discovery procedures employed in random quadrat sampling are examined with particular emphasis on survey intensity and the effectiveness of shovel-test sub sampling. After brief presentation of regional quadrat data and the nature of archaeological distributions in the study area, sampling bias is evaluated through Monte Carlo simulation methods. Finally, suggestions for improving field techniques are offered and logistical impediments to greater survey intensity are discussed.

Zuidema, R. Tom (Illinois)

[48] INCA TREATMENT OF THE DEAD

Inca kings were the founders of corporate kin groups. Their mummies were carefully preserved, stored in ceremonial buildings, and regularly venerated. Other Incas were similarly mummified and venerated but not all. In fact, mortuary practices were diverse. This paper examines the variety of means employed by Inca peoples for disposing of the dead, and seeks to identify the factors that determined each type of disposal. What was the significance of one form of disposal as opposed to another?

Zurita-Noguera, Judith (Instituto de Investigaciones Anthropológicas)

[61] PHYTOLITHS IN MEXICAN FLORA

Phytolith analysis of flora significant in Mexican prehistory has tended to focus on cultigens, such as maize, beans and squash. Investigation of other taxa, e.g. cactus and other xerophytes, indicates potential for identification of a number of ethnobotanically important plants in archaeological sediments.

Zvelebil, Marek (Sheffield)

[34] THE EVOLUTION OF POSTGLACIAL LITHIC TECHNOLOGY IN NORTHERN EUROPE

This contribution offers an overview of the changes in lithic technology for the Mesolithic Period (ca. 10,000-5,000 BP) in the Circum-Baltic region of Northern Europe. The increase in technological competence, subsistence food procurement strategies, procurement of raw materials, and territorial circumscription are all considered key variables in the development of microlithization, and in other technological shifts attested during this period of European prehistory.

ABSTRACTS OF POSTERS

Adams, C. (see Hohman, J.) [54]

Addison, David (see Sweeney, M.) [30]

Alvarez, C. (see Toscano Hernandez, L.) [31]

Amick, D. (see Buck, P.) [101]

Andrews, M. (see Newton, R.) [69]

Applegate, Alexander and Harold Hietala (Southern Methodist)

[30] SYNCHRONIC AND DIACHRONIC INTERPRETATIONS OF MIDDLE PALEOLITHIC LOCALITIES DURING THE LAST INTERGLACIAL AT BIR TARFAWI, EGYPT

The Bir Tarfawi Basin in the Western Desert of Egypt offers an abundance of Middle Paleolithic occupations geoarchaeologically associated with the margins of three freshwater lakes between 175,000 and 70,000 years ago. These sites range from repeated rainy season occupations associated with the harvesting of plant remains to a kill site in the dry season. The interpretation of spatial and locational patterns at these sites reveal a high degree of variability both within and between sites through time and space.

Arkush, Brooke (Weber), Philip Wilke (California-Riverside), Matthew Hall (Far Western Anthropology Research) and Robert Parr (California)

[101] PREHISTORIC WING TRAPS IN THE WESTERN GREAT BASIN

During the past seven years, various archaeological investigations in eastern California and Nevada have documented the presence of numerous aboriginal wing traps, most of which were used to capture deer or pronghorn during communal hunts. This presentation focuses upon four wing traps located in the Mono Lake and Walker Lake drainages of east central California and west central Nevada, respectively, and their roles within regional prehistoric cultural systems, as well as those of the Great Basin as a whole.

Bamforth, D. (see Larson, D.) [101]

Barrett, Thomas and Robert Santley (New Mexico)

[31] FORMATIVE PERIOD OBSIDIAN UTILIZATION IN THE TUXTLAS MOUNTAINS, VERACRUZ, MEXICO

Recent surveys in the Tuxtla Mts. of Mexico have recovered a large sample of obsidian from 180 archaeological sites. This paper reports on changes in source utilization, assemblage composition, and technology from these samples during the Formative Period. Extant data indicate major changes in reduction technology, with simple blades and flakes comprising most of the assemblage from Early and Middle Formative times and prismatic blades constituting the bulk of all materials from all later time periods, which along with other shifts in utilitarian technology suggest changes in the types of food resources consumed.

Bartolotta, Kim (SUNY Buffalo)

[15] CHARACTERIZATION OF ARCHAEOLOGICAL SEDIMENTS BY LABORATORY TECHNIQUES

Sediments from a Medieval Farm site in Arctic Norway were characterized by the following techniques: Particle-Size Distribution, X-Ray Diffraction, Organic Content, pH and Trace Element Content. These techniques quantify the sediments allowing statistical comparison between different cultural layers. The results demonstrate some correlations between layers and in some cases non-correlations among individual layers. Implications for methods employed in the field.

Baugh, T. (see Victor, K.) [54]

Bausman, C. Britt (see Collins, M.) [101]

Bayman, James (Arizona State) and Sara Chavarria (Arizona)

[54] SHELL ORNAMENT PRODUCTION IN THE MARANA PLATFORM MOUND COMMUNITY

Classic period Hohokam platform mound settlements have often been interpreted as community centers for the circulation of information and economic resources. Evidence for localized craft production, particularly of prestige goods, is one potential dimension of this function. This study presents evidence for the centralized production and restricted distribution of shell ornaments in an Early Classic platform mound community in the Tucson Basin. Data from comparable depositional contexts

(i.e., middens) include unmodified shell, production tools, manufacturing debris, and partially worked and finished shell ornaments. The relevance of patterning at Marana is explored with respect to Classic period community organization.

Beck, Colleen (Desert Research Institute)

[15] LICENSE TO LOOT

In order to curb the looting of archaeology sites, professional archaeologists need to be familiar with the pothunters' ever-changing techniques to gain access to sites and collections. A recent twist on the old story is the proliferation of high quality mail order identification documents that declare that the bearer is a member of such reputable societies as the American Association of Archaeologists. This poster presents examples of these identifications with discussion.

Beck, Lane and Diane Zorich (Harvard-Peabody Museum)

[15] OPTIMIZING COMPUTER FORAGING: NETWORKS, DATABASES, AND REPATRIATION

The NAGPRA legislation passed in 1990 mandates inventory and cultural identification of anthropological collections from the U.S. Regardless of the adequacy of existing catalogue systems, the management of record groups associated with repatriation is facilitated by use of a computer media. At the Peabody we combine INGRES, a relational database on a Sun/Unix platform, with a Mac star network which can be linked to the Internet. Through this poster we will share our experience developing this system and solicit consultation from regional experts.

Berres, Thomas (Illinois), Kenneth Farnsworth (Center for American Archaeology) and Randall Hughes (Illinois State Geological Survey)

[84] NORTHERN ILLINOIS PIPESTONE AND HOPEWELLIAN EXCHANGE SYSTEMS

"Pipestone" platform pipes recovered at Hopewellian sites in Illinois were assumed to have been manufactured from kaolinitic flint clays of southern Ohio. However, recent X-ray diffraction analysis of raw and finished Illinois "pipestone" artifacts demonstrate that they derive from a northwestern Illinois berthlerine flint clay unequivocally different from any other North American source. The claystone occurs in the Neda Formation of the Maquoketa Group in the Rock River Valley. Current views of Middle Woodland exchange systems and cultural interaction must be revised accordingly.

Brewington, Robbie (Texas A & M)

[54] STYLISTIC VARIABILITY IN MIMBRES SITES: SOCIAL SEGREGATION AND GENDER-LINKED CRAFTS

Stylistic variability between sites in the Mimbres and Gila valleys in painted design on Mimbres Black-on-White ceramics provides a basis for arguing some degree of social segregation within the populations we call Mimbres. A comparison between the West Fork and NAN ruins is used to demonstrate regional heterogeneity in female-linked crafts and regional homogeneity in male-linked crafts. A model based on information exchange and social networks as riskbuffering mechanisms is proposed to explain these differences.

Buck, Paul, Daniel Amick and William Hartwell (Desert Research Institute)

[101] A PREHISTORIC STONE QUARRY IN MIDWAY VALLEY, SOUTHERN NEVADA

Mitigative data recovery was conducted in 1991 at a 7 km² surface lithic scatter on the Nevada Test Site, Nye County, Nevada. About 95% of the assemblage of 5500 artifacts is lithic debris from the reduction of low grade chalcedony nodules dispersed across the site. The remainder of the collection includes cores, bifacial tools, and flake tools. Projectile points are dominated by Great Basin Stemmed series and Pinto points. Two major patterns of land use are distinguished: an earlier pattern suggestive of discard of expended items from a transported tool kit, and a later pattern of opportunistic but exhaustive exploitation of meager lithic resources.

Bullock, Peter (Office of Archaeological Studies-Museum of New Mexico)

[54] ANASAZI POLITICAL ORGANIZATION

Anasazi political organization can be inferred through a regional synthesis of cultural variability, the regional ceramic sequence, localized population densities, and community temporal, spatial, and sequential development. This material reveals a single uniform cultural identity, and a unified regional political system. The Chaco system served as the main physical manifestation of this Anasazi regional political organization. Political organization, including management of the Chaco system, appears to have been directed from an "Anasazi Heartland" extending from southwestern Colorado to the San Juan River.

Butler, Virginia (Colorado and Battelle) and James Chatters (Battelle)

[101] ON THE IMPORTANCE OF BONE DENSITY IN STRUCTURING PREHISTORIC SALMON BONE ASSEMBLAGES

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 10 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.

Cantley, G. (see Crozier, N.) [54]

Cassedy, Daniel (Garrow Associates), Paul Webb and Tracy Millis (SUNY-Albany)
[68] NEW DATA ON MAIZE HORTICULTURE IN NEW YORK AND SOUTHERN NEW ENGLAND

Recent excavations for the Iroquois Pipeline Project have recovered maize and other subsistence remains from multiple features at four different sites in the Mohawk, Hudson, and Housatonic drainages. Maize fragments were found in twenty-two features and beans in two features, and nine radiocarbon dates obtained from associated wood charcoal range from A.D. 850 to A.D. 1720. This paper discusses how these data relate to existing ideas concerning the timing of the introduction of cultigens to the Northeast and the relative contributions of cultigens to the aboriginal diet.

Cassedy, D. (see Garrow, P.) [68]

Castorena, Joe (Office of the Medical Examiner-Bexar County) and Leoncio Garza-Valdes
[15] ARCHAEOLOGICAL SAMPLE IDENTIFIED AS COPAL (BURSERA BIPINNATA) BY CAPILLARY GAS CHROMATOGRAPHY/MASS SPECTROMETRY

A white amorphous archaeological sample from the Late Formative Period was identified as Copal (*Bursera bipinnata*) using Gas Chromatography/Mass Spectrometry, with subsequent confirmation using Fourier Transform infrared spectrophotometry (FT-IR). The sample, originally believed to be ground corn, was found in a bowl which originated in the Balsas river region in the State of Michoacan, Mexico. Although the original intent of the analyses was to rule out the presence of hallucinogenic compounds such as Psilocybin (*Psilocybe mexicana*), Mescaline (*Lophophora williamsii*), Hyoscyamine and Scopolamine (*Datura*), characterization was accomplished when the spectral data of the unknown sample was compared with a reference sample.

Cesarski, Ellen (SUNY Albany)

[84] A PROPOSAL CHRONOLOGICAL SEQUENCE FOR MOUND CITY

Mound City is a Hopewell earthwork consisting of 23 mounds marking the locations of mortuary related structures. A number of excavations have been carried out beginning in the 1840's. The results of these excavations are synthesized here, the mounds are divided into three groups, and a construction sequence is proposed. The tripartite division is supported by discriminant functions run on the structural variables.

Charles, Douglas (Wesleyan)

[84] PROJECTING SETTLEMENT DISTRIBUTIONS FROM SURVEYS OF MORTUARY SITES

Based on a survey of Woodland (2100-1000 BP) burial mounds from two transects of the lower Illinois valley, initial Middle Woodland settlement followed by Late Woodland territorial packing of the valley was documented (*World Archaeology* 1992). This poster presents analysis of data from a third transect and from a tributary valley. This study confirms the original findings and additionally demonstrates 1) a geographic break in Late Woodland mound distributions corresponding to a boundary between ceramic style zones, and 2) that Middle and Late Woodland settlement distributions along the tributary stream changed in concert with developments in the Illinois valley.

Chatters, J. (see Gard, H.) [101]

Chatters, J. (see Butler, V.) [101]

Chavarria, S. (see Bayman, J.) [54]

Chiu, M. (see Rolett, B.) [30]

Clarkson, Persis (Winnipeg)

[31] GEOCHEMICAL DATING APPLICATIONS TO STONE FEATURES, NAZCA, PERU

A variety of experimental and proven techniques have been applied to stone artifacts and features in archaeological contexts. Organic matter trapped within natural accretions on stone in stable environments can be extracted and dated using accelerator mass spectrometry radiocarbon dating. The applicability, success and screening procedures of these and other techniques are illustrated from the Nazca region of south coastal Peru, where geoglyphs and subterranean irrigation systems have

been dated independently and cross-dated with other data from the region. These techniques are applicable to a number of archaeological contexts.

Cobb, Charles (SUNY Binghamton)

[68] CHERT PROCUREMENT STRATEGIES IN THE CENTRAL HUDSON VALLEY, NEW YORK

Although the Hudson Valley of New York is known to be rich in prehistoric lithic sources, few quarries have been systematically documented. This presentation describes the results of extensive excavations at the Hollister Lake Quarries, a central Hudson Valley chert source that was intensively exploited from the Late Archaic to Middle Woodland periods. This work has provided important insights into patterns of chert extraction and early-stage reduction strategies in the region. The identification of an adjoining habitation area—rare for quarry sites—has also clarified the nature of the position of the quarry within the larger settlement system.

Coinman, Nancy (Tulsa)

[30] THE UPPER PALEOLITHIC IN SOUTHERN LEVANT: NEW DATA FROM JORDAN

Levantine Upper Paleolithic assemblage types are examined using new data from Jordan. Most Upper Paleolithic lithic assemblages in the southern regions of the Levant are typically Ahmarian. Representations of the Levantine Aurignacian in the south are uncommon and poorly understood relative to assemblages originally identified in the northern Levant. Non-Ahmarian lithic assemblages from south Jordan are described and evaluated within the current interpretive framework. Discussion focuses on the relevance of the Levantine Aurignacian to non-Ahmarian assemblages in the southern Levant.

Collins, Michael, Paul Goldberg and C. Britt Bausman (Texas)

[101] INTERDISCIPLINARY INVESTIGATIONS OF PALEOINDIAN OCCUPATIONS AT THE WILSON-LEONARD SITE, TEXAS

A newly excavated Paleoindian complex and later occupations at the Wilson-Leonard Site provide unique information on Late Pleistocene inhabitants, and the transition from Paleoindian to Archaic hunter-gatherers. Paleoenvironmental reconstructions, paleoeconomic data, and technofunctional analyses of stone tools are used to investigate hunter-gatherer exploitation patterns. Archeomagnetism and micromorphology elucidate the human activities responsible for the formation of specific features, such as burned rock middens and hearths. Geoarchaeological context is furnished by micromorphological analysis of sediments, which establishes a detailed record of geogenic and anthropogenic depositional and postdepositional processes.

Cowan, R. (see McPherron, A.) [30]

Cramer, Ann (U.S. Forest Service)

[69] WAYNE NATIONAL FOREST HERITAGE RESOURCE PROGRAM

This exhibit will present the Heritage Resource Program for the Wayne National Forest, Athens, OH. Programs such as public archeology outreach, artifact collection, special areas and National Register of Historic Places will be included in this photographic essay.

Crozier, Neal and Garry Cantley (Bureau of Indian Affairs)

[54] BRANCH OF ROADS ARCHAEOLOGY PROGRAM, BUREAU OF INDIAN AFFAIRS, PHOENIX AREA OFFICE

Since 1984, the Phoenix Area Branch of Roads, Bureau of Indian Affairs, has employed at least one full time archeologist. Prior to constructing, upgrading or maintaining any road on the 42 Indian Reservations under the jurisdiction of the Phoenix Area Office, an archeological survey is conducted. More than 700 miles have been surveyed and 100 National Register eligible historic properties have been recorded and mitigated. In addition to conducting surveys, Bureau archeologists have been engaged in archeological field schools for Tribal members. The history and successes of this little known program are depicted in the poster.

Dancey, William (Ohio)

[84] ADENA MORTUARY PRACTICES IN CENTRAL OHIO

Numerous burial mounds identified as Adena have been excavated in central Ohio on the northern periphery of this cultural tradition. Few have been published and the purpose of this poster session is to bring them to public attention. Floor plans, stratigraphic profiles, burial facilities, and artifacts from a number of these sites are illustrated. Included are Niles, Wolford, Florence, McMurray, Sidner, Galbreath, W. H. Davis, and five from Alum Creek Reservoir. Artifact style and burial program distributions are mapped to identify regional and area wide patterns. A time-space chart of all Adena sites explores explanations of regional variability.

Danzeiser-Dockall, Helen (Texas A&M)**[54] SEXUAL DIMORPHISM IN PREHISTORIC AND HISTORIC INDIANS FROM TEXAS**

Long bones were used to ascertain the degree of sexual dimorphism among historic agricultural and prehistoric hunter/gatherer groups from Texas. Within both groups, dimensions of the upper body (including length, breadth, and circumferences) tend to be more dimorphic than those of the lower body. Seventeen of 27 measurements were more sexually dimorphic in the historic group as compared to the prehistoric group. Measurements provided little indication as to which group was more dimorphic, suggesting strong, environmental influences.

Dauble, Dennis (see Gard, H.) [101]

Dobbs, C. (see Zschomler, K.) [15]

Deegan, Ann (Utah)**[54] KAYENTA ANASAZI FIBROUS SANDAL TEXTILE CONSTRUCTION TECHNIQUES**

Major textile construction techniques seen in fibrous sandals of the Kayenta Anasazi (ca. A.D. 400-1300) will be presented. This work is based on laboratory analysis of approximately 120 fibrous sandals from the Museum of Natural History, University of Utah, and the Anthropology Collection, Museum of Northern Arizona. The dependency of sandal silhouette and incorporated designs on construction technique will be visually presented. Additionally, potential uses of sandal construction data will be examined including tracking of group movements through sandal technique complexity.

Dowd, Anne (Brown University)**[68] A NORMANSKILL PROJECTILE POINT REDUCTION SEQUENCE**

The Breezy Knoll site is a single component Late Archaic period River Phase site in upstate New York. Located about 2 km east of the Hudson River on a narrow ridge, this site has yielded discarded Normanskill projectile points, bifaces in various stages of reduction, hammerstones, and much chert debitage. Analysis of this assemblage has delineated the process of manufacturing Normanskill points using locally available Normanskill and Helderberg cherts. These data are presented to aid the understanding of lithic reduction sequences and lifeways in the Hudson River Valley at the close of the Late Archaic period in the Northeast.

Elson, Mark (Center for Desert Archaeology) and James Gunderson (Wichita)**[54] PROCUREMENT, PRODUCTION AND DISTRIBUTION OF ARGILLITE ARTIFACTS: A PRELIMINARY EXAMINATION OF SOUTHWESTERN INTERACTION SYSTEMS**

Argillite is a soft, red, shale-like sediment, called pipestone or catlinite in the American Midwest. It is particularly suitable for manufacture into small beads and pendants; recent evidence also suggests that argillite was being used as a red pigment in prehistoric ceramic manufacture. X-ray diffraction analysis of over 700 source area rocks and 150 argillite artifacts indicates that there are three major source zones for argillite procurement in the American Southwest. Artifacts from these sources are differentially distributed at sites throughout the Southwest. These data suggest the presence of multiple exchange spheres with one clearly dominant source.

Farnsworth, K. (see Berres, T.) [84]

Frison, G. (see Reher, C.) [101]

Gard, Howard, Dennis Dauble, and James Chatters (Pacific Northwest Laboratory)**[101] SALMONID BEHAVIOR AND RIVER MORPHOLOGY AS A MEANS OF PREDICTING ARCHAEOLOGICAL FISHING SITE LOCATIONS**

Research into prehistoric aboriginal fishing practices and locations has increased in importance as native salmon runs decrease and controversy over the declining resource increases, particularly with reference to Native American fishing rights. The Hanford Reach, of the Columbia River, provides a study area where locations of archaeological fishing sites can be predicted based upon the behavior of anadromous fish and the channel morphology. It is possible to determine the fishing method employed at a site by establishing what the most efficient fishing method would be for a location, and correlating that information with archaeological features and artifacts. This approach provides a means of checking ethnographic information and verifying traditionally gathered archaeological data on fishing locations.

Garrow, Patrick, Daniel Cassedy and Paul Webb (Garrow and Assoc.)**[68] AIN'T IT A GAS? ARCHAEOLOGY OF THE IROQUOIS PIPELINE**

The 370-mile Iroquois Pipeline traverses the Northeast from the St. Lawrence River southwest across the Mohawk and Hudson Valleys into southwestern Connecticut. A total of 540 sites were identified along the route, with intensive testing performed at 192, and data recovery excavations

conducted at 38. Temporally, components range from the Early Archaic to the Historic, and spatially from the Mohawk River to Long Island Sound. The Iroquois project has assembled a substantial body of systematically collected regional data. This presentation provides a project overview organized around themes of diachronic and geographic changes in prehistoric resource use and settlement patterns.

Garza-Valdes, L. (see Castorena, J.) [15]

Giardino, J. (see Waters, M.) [15]

Glascoc, M. (see Neff, H.) [101]

Goldberg, P. (see Collins, M.) [101]

Graham, Martha (American Museum of Natural History)**[54] OBJECTS OF INQUIRY: MATERIAL EXPRESSIONS OF A CENTURY OF RARÁMURI CULTURE CHANGE AND PERSISTENCE**

Archaeologists use their understanding of material culture and its distribution in space to make inferences about the cultural processes and adaptations of the past. Objects, photographs, and associated archival documents of the Rarámuri (Tarahumara) made during the 1890s are contrasted with modern ethnographic and ethnoarchaeological observations. These data provide the opportunity to consider 100 years of Rarámuri culture change and persistence. Particular attention is paid to material objects and their spatial arrangements in the larger context of the cultural system. The articulation between material and non-material culture, and how we use archaeological materials to interpret the past is discussed.

Greene, Glen (Northeast Louisiana)**[84] FIVE YEARS OF CORING AT POVERTY POINT**

Solid core extraction and limited testing has been systematically conducted at the Poverty Point Site during the summer field seasons over the past five years (1988-1992). Approximately 550 solid cores were extracted, in part, on a 20 meter grid interval, described and measured. In the 1992 season 294 cores were recovered along the crest of Ridge 1 on a 2 meter interval. The research has: 1) defined five soil types in the cored area (ridge crests, ridge slopes, ridge swales, aisleway soils and the Plaza Area); 2) provided subsurface maps of the paleo-landscape of portions of the original Macon Ridge as it was between 3000 and 4000 years ago, as defined by the Aa-AB contact; 3) the discovery and excavation of the first complete structure from the site; and 4) the 1992 discovery of 22 more buried prepared surfaces on Ridge 1.

Gregg, Michael (North Dakota) Fern Swenson (State Historical Society of North Dakota) and Paul Picha (Missouri-Columbia)

[101] MIDDLE WOODLAND CULTURAL DEVELOPMENTS ON THE NORTHERN GREAT PLAINS: RECENT DATA AND NEW INTERPRETATIONS

Archaeological investigations conducted during the past decade on the Northern Great Plains have generated a vast array of new information on Middle Plains Woodland period (100 B.C. to A.D. 600) cultural developments. Inferences regarding lithic and ceramic technology, long-distance trade and regional interaction, and subsistence practices are reviewed in light of these new data.

Gunderson, J. (see Elson, M.) [54]

Haas, Daniel (U.S. Forest Service)**[69] THE GREAT SALT SPRING EXHIBIT**

In 1981 the Department of Anthropology, Southern Illinois University at Carbondale began a ten year archeological study of Saline Springs, Gallatin County, Illinois. Saline Springs is listed on the National Register of Historic Places and forty acres of the site is managed by the U.S. Forest Service, Shawnee National Forest. This traveling exhibit describes the archeological significance of the site by presenting four stories: the GREAT SALT SPRING provides the site history; SALT PRODUCTION illustrates both aboriginal and historic salt production techniques; CLUES TO THE PAST features photographs of artifacts discovered at the site and their use; and KNOWLEDGE IS THE KEY portrays archeological looting and the value of public outreach programs. Brochures will be provided with the exhibit.

Hagstrum, M. (see Jackson, M.) [31]

Hall, M. (see Arkush, B.) [101]

Hard, R. (see Kosub, L.) [30]

*Harrold, Francis (Texas-Arlington)***[30] ARCHAEOLOGICAL RESEARCH IN SOUTHERN ALBANIA**

In 1992, a joint American-Albanian team completed its first season of excavation and geoarchaeological research in the Sarande District of southern Albania. Excavation at Konispol Cave recovered cultural materials ranging in age from the Hellenistic to at least the Early Neolithic periods, and produced samples for the first multiple radiocarbon dates from any site in Albania. At Xarë, an open-air site with Middle and Upper Paleolithic components, preliminary surface collection and electrical resistivity survey took place. Results and plans for future research will be discussed.

Hartwell, W. (see Buck, P.) [101]

*Heidke, James (Center for Desert Archaeology)***[54] APPLIED QUANTITATIVE CERAMIC PETROLOGY, AN EXAMPLE FROM SOUTHEASTERN ARIZONA**

Analysis of archaeological ceramics by two analysts—one using low magnification reflected light microscopy and the other petrographic microscopy—permits the accurate characterization of large numbers of sherds. Point-counted compositional and textural data, recorded from a subset of the ceramics, provides evidence regarding the likely production source of the vessels and an assessment of the degree to which potters working within the region participated in a shared technological tradition. Morphological and design attributes, recorded from the entire sample, permit the degree of interaction between potting communities to be estimated and intraregional variability in the rate of design style change to be measured.

*Herhahn, Cynthia (Arizona)***[54] FOURTEENTH CENTURY AGRICULTURAL DIVERSITY IN THE NORTHERN RIO GRANDE VALLEY, NEW MEXICO**

Agricultural intensification between AD 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.

Hietala, H. (see Applegate, A.) [30]

*Holt, Henry (Berger Associates)***[68] EXCAVATIONS AT THE WAPPINGER CREEK SITE (230-3-1) DUTCHESS COUNTY, NEW YORK**

Phase III excavations conducted at the Wappinger Creek site, Dutchess County, New York, revealed stratified Late Woodland and Late Archaic components. A Chance phase hamlet, characterized by the floor plan of a small, oval house, was found at the base of a buried A-horizon, located immediately beneath the plowzone. Associated with this house were several refuse pits, some containing carbonized corn kernal. Stratified below the buried A-horizon was a fine silt loam C-horizon containing a number of Late Archaic hearths, one with a Susquehanna Broadspear point in association. Unfortunately, no carbonized faunal or floral remains were found in the Late Archaic hearths. The accompanying plates illustrate aspects of this site's stratigraphy as well as the features found with each of the components present.

*Hohmann, John, Diane White, and Christopher Adams (Berger Associates)***[54] ARCHITECTURAL VARIABILITY AT THE SITE OF CASA MALPAIS, ARIZONA**

The site of Casa Malpais, located near Springerville, Arizona, represents one of the largest and most architecturally complex ancient Mogollon communities in the Southwest. Consisting of a large masonry pueblo, a Great Kiva complex, several masonry compounds, an enclosing fortified wall, two gateways, three masonry stairways, additional terrace wall segments, a prehistoric trail system, numerous isolated rooms, catacombs, and sacred chambers, Casa Malpais represents a unique opportunity to study architectural variability within a late Mogollon community controlling for time and cultural associations. Ceremonial versus domestic architectural styles are discussed.

*Hovezak, Mark (Crow Canyon Archaeological Center)***[54] CONSTRUCTION TIMBER ECONOMICS AT SAND CANYON PUEBLO, SOUTHWESTERN COLORADO**

The author compares construction timber availability to use by thirteenth-century Anasazi builders in the American Southwest. Needs are based on Sand Canyon Pueblo architectural and dendrochronological data and characteristics of cliff-dwelling structural beams. Supply is based on modern *Pinus*

edulis-Juniperus osteosperma woodland stand characteristics. Ten models simulating differing supply and demand relationships yielded construction beam catchments between 72 and 159 hectares. Large beams needed in the roofs of kivas and towers were rare. Competition for these items may have resulted in the development or strengthening of social institutions that regulated natural resource procurement.

*Hufnagle, John (Southern Methodist)***[54] THE RELATIONSHIP OF CERAMIC MORPHOLOGY TO SETTLEMENT POPULATION IN THE NORTHERN RIO GRANDE A.D. 1000-1250**

Over the past century, ceramics in the American Southwest have been used primarily for chronology building. Research directions now link ceramics to the broader realm of prehistoric lifeways. This project investigates theories relating vessel morphology to settlement population. Ceramics from Northern Rio Grande sites dating between A.D. 1000-1250 are compared. The results support the general model that vessel size can be correlated to settlement population. The results also suggest the need to consider the impact of changes in subsistence and ecological factors on vessel morphology.

Hughes, R. (see Berres, T.) [84]

*Jackson, Martha and Melissa Hagstrum (Washington)***[31] CERAMIC TOOLS FOR INKA METALLURGY: TECHNICAL ANALYSES OF MATERIALS, MANUFACTURE AND USE**

Petrography, XRD and microprobe analysis were utilized to characterize materials, to discern manufacturing techniques, and to trace use histories in a collection of ceramic crucibles and molds used in Inka-period metallurgy in the Calchaqui Valley, NW Argentina. Graphic presentation of the results will demonstrate and compare the contributions of the various techniques to our understanding of the objects' manufacture and use.

*Johnson, Amber (Southern Methodist University)***[54] CHUPADERO AND TABIRA—FUNCTION VS. STYLE: A STUDY OF BLACK-ON-WHITE JARS FROM GRAN QUIVIRA PUEBLO, NEW MEXICO**

A study of standardization in formal and stylistic attributes of black-on-white jars from Gran Quivira pueblo (A.D. 1300-1575), New Mexico, does not reveal trends which would suggest a change in the organization of production of these vessels. Trends in the data suggest a functional distinction between Chupadero and Tabira black-on-white jars which have been previously distinguished using stylistic and temporal criteria. The implications of this interpretation are discussed with respect to the use of ceramic typologies and the timing of proposed intensification in Plains/Pueblo interaction.

*Johnson, William (Desert Research Institute)***[15] ARCHAEOLOGICAL RESEARCH IN CONTAMINATED AREAS: PLUTONIUM VALLEY AT THE NEVADA TEST SITE**

The growth of archaeological research associated with legislated compliance has resulted in encounters with contaminated areas. Plutonium Valley is one such contaminated area. As its name implies, radioactive materials form the basis of the contamination. Thus, conducting archaeological research in Plutonium Valley requires use of special gear and modifications of procedures for recording data. These are presented in poster format for comments and suggestions and, it is hoped, to open a dialogue on conducting archaeological research in contaminated areas.

*Jones, Joel (Garrow & Associates, Inc.)***[68] EXCAVATION OF DEEPLY BURIED ARCHAIC COMPONENTS ON THE MOHAWK RIVER**

Excavations at the Five Mile Dam Site, near Little Falls, New York, uncovered a series of Late and Terminal Archaic occupations in the Mohawk River floodplain. Mechanical stripping exposed 62 features, including several large stone platform hearths radiocarbon dated ca. 3620 to 3930 B.P., and a well preserved Otter Creek/Brewerton living floor of the "Proto-Laurentian" South Hill phase dated between 5230 and 5380 B.P. Functional interpretations of the platform hearths are provided, and the Otter Creek/Brewerton component and its contribution to the chronology of Proto-Laurentian manifestations are discussed.

*Kandare, Richard (U.S. Forest Service)***[69] ECOSYSTEMS MANAGEMENT ON THE ALLEGHENY NATIONAL FOREST, PA**

The effects of the historic railroad era in Northwestern Pennsylvania (ca. 1890-1930) completely changed the forest cover and patterns of forest growth in the Allegheny National Forest region. Historic and silvicultural data indicate that different cutting practices resulted in differences in forest cover. This poster presents the results of a recent interdisciplinary study conducted within the Forest

to determine whether there are silvicultural and archeological correlates to the different historic logging practices, modern forest cover and the nearness or distance to historic railroad logging lines and wood chemical factories.

Kosub, Linden and Robert Hard (Texas-San Antonio)

[30] EARLY BRONZE AGE GROUND STONE TOOLS: A REMARKABLE CASE OF ORE PROCESSING IN CENTRAL ANATOLIA

Goltepe, a recently discovered ore processing site in Central Anatolia, has yielded over 50,000 stone tools on the surface level alone. Excavations within the last two years have uncovered thousands more in virtually every cultural deposit. Kestel mine, located two km away, displays signs of extensive ancient mining operations. Ground stone tools are a prominent part of the surface artifact assemblage, both inside and outside the mine. Evidence for domestic utilization of stone tools can also be found at Goltepe and Kestel. Questions to be addressed will concern: type vs. function, residue analysis and experimental duplication of stone tool ore processing.

Larson, L. (see Lewarch, D.) [101]

Larson, Daniel (California) and Doug Bamforth (Colorado)

[101] CLIMATIC VARIABILITY, RESOURCE PREDICTABILITY, PRODUCTION: A CULTURAL-ECOLOGICAL BACKGROUND FOR THE LATE OCCUPATION OF THE GREAT PLAINS

Arguing from a risk-minimization perspective, we consider the climatic background to the post-AD 1600 aboriginal occupation of the Great Plains. Dendroclimatic reconstructions for fifteen stations scattered over the Plains allow us to reconstruct year to year patterns in climatic conditions with critical implications for horticulture and bison hunting. Although our data illuminate long-term trends in climate, we focus particularly on the frequency and magnitude of severe periods of deprivation as well as of beneficial conditions, which were probably more important determinants of human adaptions. These data also outline the framework within which Contact Period forces disrupted cultural-ecological relations in the region.

Lewarch, Deanic (Larson Anthropological/Archaeological Services), Julie Stein (Washington) and Lynn Larson (Larson Anthropological/ Archaeological Services)

[101] COASTAL SITES IN SEATTLE, WASHINGTON: HOW MANY OTHERS ARE BELOW SEA LEVEL?

A site complex was discovered below contemporary sea level during construction at the METRO sewage treatment plant in Seattle, Washington. Shell midden deposits, fire modified rock features, buried soils, and a diverse assemblage of bone, antler, and lithic artifacts indicate this area of Puget Sound coast was occupied intensively ca. 4,000 to 1,000 years ago. The landscape was lowered over 2 meters below present sea level by faulting during a large earthquake. Discovery of these sites below sea level suggests many Southern Puget Sound littoral sites older than 1,100 BP are inundated.

Linder, Christopher (Bard)

[84] EFFECTS OF CATASTROPHIC FLOODS OCCASIONED BY MISUSE OF THE LANDSCAPE

Maps and stratigraphic tests of a river bend locality illustrate widespread effects upon archaeological site contexts. The Schoharie watershed of eastern New York serves to model geomorphic conditions and historical circumstances that led to increases in severe flood frequencies. Landscape survey encountered deposits in reverse stratigraphic sequence in regard to cultural chronology, while elsewhere remains still in situ lay buried under unusually thick and/or coarse overburden. Fine overbank sediments may have protected one site from subsequent high energy floods that emplaced sands and gravels. This rare late Early Woodland occupation had microdrills that suggest connections to the Middlesex mortuary complex.

Lintz-Dohr, Susan and Selma Morley (California State University-Long Beach)

[54] DEMOGRAPHIC, CLIMATIC AND SETTLEMENT PATTERN CHANGE AMONG THE WESTERN ANASAZI BETWEEN AD 500–1250: A NEW ASSESSMENT OF SURVEY DATA

Preliminary survey data has been digitized with a Geographic Information System providing graphic visualization of settlement data. This allows a rapid assessment of environmental variables and site location. Survey was conducted in Southern Utah where little is known about the archaeology in the region from AD 1100–1250. The focus was to place sites within their environmental context for analysis; environmental variables included elevation, soils, distance to water, and vegetation. Analysis has shown a late P II and early P III Anasazi presence. Combining site location and environmental data, there is evidence of settlement pattern change in association with demographic and climatic factors.

Lipe, W. (see Schlanger, S.) [15]

Longo-Hughston, Lori (Southern Methodist), David Meltzer (Southern Methodist) and George McMechan (Texas-Dallas)

[15] GROUND PENETRATING RADAR INVESTIGATION OF ALTITHERMAL AGE SITES ON THE SOUTHERN HIGH PLAINS

Altithermal-age water wells are known from several sites on the southern High Plains, occurring in abundance at the sites of Blackwater Locality No. 1 and Mustang Springs. In an effort to detect other such sites, and test the utility of ground penetrating radar (GPR) in mapping the well features, the technique was used at the Gibson Ranch site on Blackwater Draw, some 80 km downstream from Blackwater Locality No. 1. The GPR results were very encouraging, indicating clear anomalies which, in plan and profile resembled wells. Subsequent ground-truthing further tested the GPR results.

MacKinnon, Jefferson (Maryland-European Division) and Jeffrey Olson (Wisconsin-Madison)

[31] CLASSIC PERIOD MAYA EXTRACTION OF CLAY RESOURCES ON THE COAST OF SOUTHERN BELIZE

The results of excavation of a Classic Maya clay extraction site on the banks of the Sennis River in the Stann Creek District of Belize, Central America are reported. Located less than a kilometer from the Caribbean, the site is part of a pattern of small salt production, lime production, fishing, and hunting sites which suggest that the Maya of larger centers with ceremonial architecture located somewhat further inland may have procured a variety of coastal and marine resources without establishing permanent coastal habitation sites.

Mangan, Patricia (Massachusetts)

[30] THE SPATIALIZATION OF EARLY CAPITALISM: A CASE STUDY OF CATALONIA, SPAIN

Interest in the spatial dimensions of power relations has grown as researchers demonstrate that space is an active component of sociopolitical processes. This paper examines the spatial dimensions of a medieval town's transition from feudalism to capitalism and considers how features of the built environment were used to exercise power and control. Techniques of sociopolitical control are seen to directly involve spatial relations and vice versa.

Manson, Joni

[15] THE EFFECTS OF WAR ON ARCHAEOLOGICAL/CULTURAL RESOURCES AND RESEARCH

The effects of war on archaeological, historical, and cultural properties and research activities have far-reaching repercussions on our interpretations of the past. This is particularly true when remains associated with cultural or ethnic identities are specifically targeted for destruction. In the former Yugoslav republics, numerous archaeological and historical sites (including ancient fortresses, churches, monasteries, and cemeteries), museums, collections, archives, and libraries have been damaged or destroyed and research has been severely curtailed. This display illustrates the havoc wreaked by warfare and summarizes the problems faced by archaeologists who seek to preserve the past from the present, for the future.

Markman, Charles (Markman and Associates)

[84] MILLER'S CAVE 70 YEARS LATER

In 1992 the Kansas City District Corps of Engineers sponsored an investigation to return to Miller's Cave to assess the status of deposits. The project resulted in information pertinent to the history of American Archaeology as well as to the prehistory of the Ozark region in central Missouri. The cave was first excavated just after World War I by Smithsonian archaeologists, Gerard Fowke. When Leonard Blake had visited and photographed the cave and associated petroglyphs in 1939, the remains of Fowke's trenches were still visible. During the recent investigations intact Late Woodland deposits were found, which included two dog burials, as well as an undisturbed Early Archaic stratum, beneath Fowke's backdirt, yielding a radiocarbon assay of 8500 ± 180 BP.

Mather, David (Minnesota Historical Society)

[30] DIFFERING PERCEPTIONS OF LANDSCAPE FROM THE MESOLITHIC THROUGH THE ROMAN OCCUPATION: PALYNOLOGICAL AND STRATIGRAPHIC EVIDENCE FROM THE HUMBERHEAD LEVELS OF ENGLAND

A palynological analysis incorporating microscopic charcoal counts was conducted concerning fluvial stratigraphy within the River Torne floodplain in South Yorkshire. Reconstruction of the changing river regime and vegetational history indicates varying utilization and perception of the local landscape from the early Holocene until approximately 100 AD. Clearance during the Mesolithic through burning and during the Roman Period for agriculture and industry was found to have caused

the most significant environmental impact, resulting in destabilization of the river system. Separating these periods is a trend of increasing clearance for pastoral agriculture during the Neolithic, Bronze and Iron Ages.

McMechan, G. (see Longo-Hughston, L.) [15]

McPherron, Alan and Richard Cowan (Pittsburgh)

[30] MAPPING AND REMOTE SENSING AT A BRONZE-AGE "NURAGIC" SETTLEMENT ON SARDINIA

The Bronze Age village complex at Seruci (Sardinia) consists of round stone houses originally with corbelled roofs, room compounds, and a tower (nuraghe), dating to about 925 B.C. Collapsed structures are visible at the surface, but dense vegetation covers about 3/4 of the site. An initial mapping phase of research was carried out by a combination of surface survey, topographic measurements with a "total station," air photos, infra-red photography, image processing, and earth conductivity measurement. Work planned and in progress, and the theoretical framework, are discussed.

Meltzer, D. (see Longo-Hughston, L.) [15]

Milliken, Sarah (Ferrara)

[30] RAW MATERIAL ECONOMY IN THE LATE PALAEOLITHIC OF SOUTH-EAST ITALY

Traditional interpretations of the south-east Italian late Paleolithic assemblages stem from a rigid typological stance and identify two separate industrial facies which coexisted in the region, distinct in different phases of local evolution through the various stages of an epigravettian tradition. A reanalysis of some of these assemblages by focusing on their technology fails to find evidence supporting such a model, and instead suggests that the relative costs of raw material procurement and consequent strategies of tool production, use and maintenance were among the dominant factors determining the observed inter-site assemblage variability.

Millis, Heather (SUNY Albany)

[68] THE LATE WOODLAND TO HISTORIC PERIODS AT THREE SITES IN THE LOWER HOUSATONIC RIVER VALLEY OF WESTERN CONNECTICUT

Excavations by Garrow and Associates have uncovered substantial Native American occupations dating from the Late Woodland through the Historic Periods at three separate sites in the lower Housatonic drainage. This presentation outlines an ethnohistoric overview to provide a context for excavation data from two sites in Milford and one in Newtown. Summaries and interpretations of ceramics, lithic tools, features, and subsistence remains are presented.

Millis, T. (see Cassedy, D.J.) [68]

Millis, Tracy (SUNY Albany)

[68] NATIVE AMERICAN SUBSISTENCE PATTERNS IN THE LOWER HOUSATONIC RIVER VALLEY

Native American food remains are infrequently represented in archaeological contexts within southern New England. This paucity of data has resulted in an incomplete understanding of the subsistence patterns for the region. Three multicomponent sites in the lower Housatonic valley of western Connecticut are analyzed in terms of the floral and faunal material recovered from feature flotation samples. Radiocarbon dates and diagnostic artifacts associated with the features provide data to address diachronic trends in the food economy from the Late Archaic through the early Historic period at these sites.

Moore, Katherine (Bentley)

[15] CUT MARKS ON BONE IN ECONOMIC AND NUTRITIONAL CONTEXT

Patterns of cut marks on animal bone from Panaulauca, a highland hunting and herding base camp in Junin, Peru are evaluated in light of expectations that preparation of dried meat (charki) was important. Cut marks have been interpreted as traces of dismemberment, stripping meat off bone, and preparing bone for breakage to release marrow. In this study, cut mark distributions are compared to well documented shifts in overall strategies of animal use, suggesting limits to the interpretability of cut mark patterns.

Morley, S. (see Lintz-Dohr, S.) [54]

Morrison, Kathleen (Hawaii-Manoa)

[15] MICROSCOPIC CHARCOAL AND LAND USE: LAKE SEDIMENTS AND REGIONAL BURNING

In addition to its value in chronological and paleoenvironmental studies, deposited charcoal reflects a record of human-induced agricultural and domestic burning. When depositional context is con-

trolled, as in the case of lake deposits, microscopic charcoal may provide a record of burning at a regional scale. Microscopic charcoal in a sediment core from a reservoir of the Vijayanagara period (AD 1300-1600) in southern India indicates well-defined periods of high-intensity burning which can be compared with palynological and archaeological evidence of land use. Charcoal size statistics, which may indicate depositional scale, are also presented.

Morrow, Carol (Southeast Missouri)

[84] BLUE-GRAY CHIPPED STONE DISKS: MIDDLE WOODLAND THINGAMABOBS

Thousands of blue-gray chipped stone disks were buried during the Middle Woodland period in the Midwest U.S. The depositional context of these items ranges from small caches to massive mound deposits. The raw material is almost always a blue or blue-gray chert, but the specific chert type varies. The artifact form varies, but usually consists of some general bifacial form, either a flat disk or crude thick biface. This range of variation is illustrated with examples from the Illinois river valley—disks from St. Clair county, from the Baehr Mounds, and from the Beardstown cache; disks from the Crib cache, Indiana, and disks from Mound 2 of the Ohio Hopewell Mounds.

Nash, Stephen (University of Arizona)

[15] CUTTING DATE ESTIMATION AND SITE HISTORY: AN EXPLORATORY ANALYSIS

Certain physiological attributes in archaeologically important coniferous tree species of the American Southwest may be used to obtain information concerning age and growth related phenomena. Statistical relationships between various heartwood and sapwood parameters in *Pinus ponderosa*, *Pinus edulis*, *Juniperus* sp., and *Psuedotsuga menziesii*, may be used to estimate cutting dates for dendrochronologically chronological specimens. When used in conjunction with other contextual information, statistically reliable cutting-date estimates allow 1) the reevaluation of dendrochronologically derived site histories, 2) more secure chronometric placement of sites which provide few cutting dates; and 3) potentially important behavioral information regarding prehistoric wood use.

Neff, Hector, Mark Glascock, and David Walters (Missouri)

[101] NORTH AMERICAN OBSIDIAN STUDIES AT THE MISSOURI UNIVERSITY RESEARCH REACTOR

The Archaeometry Laboratory at the Missouri University Research Reactor (MURR) is amassing a database of North American obsidian source analyses to complement the existing Mesoamerican databank. As in Mesoamerica, many artifacts can be sourced with elements determined by an abbreviated, low-cost NAA procedure. Complete analysis, which yields 27 elements, differentiates the chemically similar sources. Source determination is routinely coupled with hydration rim measurement at MURR.

Neiman, Fraser (Yale)

[15] TEMPORAL DYNAMICS OF STYLISTIC VARIATION UNDER DRIFT

In evolutionary theory, a dimension of variation is stylistic if there are no deterministic forces operating to increase the frequency of one variant at the expense of others. Hence change in stylistic element frequency is a consequence of drift or sampling error that inevitably accompanies cultural transmission in finite populations. Computer simulations reveal the curves that describe change in variant frequencies are "battleship-shaped," for both a population and the individuals that comprise it. The causal linkages between variant frequencies and archaeological assemblages and the implications for archaeological practice, in particular seriation, are discussed.

Newton, Richard (USDA Forest Service) and Mike Andrews (Bureau of Reclamation, Montana)

[69] INTEGRATED CRM AND PUBLIC ARCHAEOLOGY: AN EXAMPLE FROM THE ROCKY MOUNTAIN FRONT

During September 1992, the Lewis and Clark National Forest and the Bureau of Reclamation, Montana Projects Office, co-sponsored a public archeology program at a multi-component (Late Plains Archaic to Anglo Historic) site located in the Rocky Mountains of west-central Montana. Data recovery, including subsurface testing, site mapping, and pedestrian survey, was conducted by volunteers participating in the Passport-in-Time program under the supervision of Forest Service and Bureau of Reclamation Archeologists. The unique aspects of this project (effects of inundation, public participation in Federal CRM, etc.) will be discussed in this presentation.

Olson, J. (see MacKinnon, J.J.) [31]

Parr, R. (see Arkush, B.) [101]

Parrent, J. (see Waters, M.) [15]

Picha, P. (see Gregg, M.) [101]

Quintero, Leslie (see Schneider, J.) [15]

Reher, Charles and George Frison (Wyoming)

[101] THE VORE BUFFALO JUMP: RESEARCH, EDUCATION AND ECONOMIC DEVELOPMENT IN NORTHEAST WYOMING

The Vore Site (48CK302), located in the Wyoming Black Hills, is a spectacular, well preserved classic Plains Indian buffalo jump. Test excavation in deposits at the bottom of a large, round sinkhole (ca. 65 m across) revealed 20 bone middens extending to 6 meters below ground, representing the killing and butchering of perhaps more than 10,000 bison between A.D. 1500-1800. Located directly adjacent to Interstate 90, the site was recently donated to the University of Wyoming and a campaign has been initiated for development of a multimillion dollar research and educational center. Details of the site's archaeological record and the proposed research center are presented.

Ridings, Rosanna (Southern Methodist)

[15] VARIATION OF EFFECTIVE TEMPERATURE IN OBSIDIAN HYDRATION DATING

Implicit in the calculation of obsidian hydration dates is the premise that effective hydration temperature (EHT) is constant in space and time, since only one effective hydration temperature—and thus one rate of hydration—is used for each artifact dated. To evaluate the validity of this premise, a comparative study has been conducted at Pot Creek Pueblo in north-central New Mexico. Several potential sources of variation in effective hydration temperature have been included in this study: differing activation energies of the materials involved, changes in effective hydration temperatures with depth, and changes in air temperature over long periods of time.

Robinson, W. (see Schlanger, S.) [15]

Rogers, Anne (Western Carolina)

[84] FISH WEIRS IN THE SOUTHERN APPALACHIANS

Fish were utilized in the diets of prehistoric inhabitants of the Southern Appalachian region from at least Late Archaic times onward. Fish weirs used in the acquisition of this food source remain an important component of the cultural landscape in this area. Because it is difficult to provide a temporal assignment for many of these features and to associate their use with specific cultural manifestations, they have not been studied extensively by archaeologists working in this area. This presentation provides information concerning locations of fish weirs in the Southern Appalachian region and illustrates various configurations which characterize these structures.

Rolett, Barry (Hawaii) and Min-yung Chiu (Hawaii)

[30] DOMESTIC ANIMALS IN PREHISTORIC POLYNESIAN SUBSISTENCE ECONOMICS

Polynesians introduced a wide range of domestic plants and animals as they colonized new islands. While the same species were widely distributed, they took on varying degrees of economic importance in different island settings. This study focuses on the most important domestic animals, pigs and dogs, examining their contrasting roles in the subsistence economies of two East Polynesian cultures. The study comprises a quantitative analysis of archaeologically recovered faunal remains from excavations in the Marquesas Islands and Hawai'i. Age profiles for domestic animal populations are constructed using dental criteria and epiphyseal fusion data.

Santley, R. (see Barrett, T.) [31]

Schlanger, Sarah (Museum of New Mexico), William Lipe (Washington) and William Robinson (Laboratory of Tree-Ring Research)

[15] AN ATLAS OF OCCUPATION AND ABANDONMENT ACROSS THE NORTHERN SOUTHWEST

Data abstracted from the Laboratory of Tree-Ring Research site-oriented database are used to construct an atlas of occupation and abandonment across the northern Southwest. Tree-ring dates reported by the Laboratory are treated as indicators of continued tree cutting and local occupation at or near individual sites. The earliest cutting dates and latest tree-ring determinations for these individual sites serve as the basis for allotting site-based occupation spans. The atlas, which displays occupied site loci on a decadal basis, is used to explore geographic patterning in occupation and abandonment between AD 1000 and AD 1400.

Schneider, Joan (California-Riverside), Philip Wilke and Leslie Quintero (California-Riverside)

[15] EXPERIMENTAL REPPLICATION OF THE PRODUCTION OF ABORIGINAL MILLING IMPLEMENTS

Replication of stone pestles and metates was carried out using materials from aboriginal stone quarries in the Lower Colorado River region. Percussion reduction techniques, production stages,

and labor intensity data were obtained through experimental replication. Observations of both the experimental and aboriginal reduction processes, including breakage, abandonment, and debitage patterns allowed a more complete understanding of the organization of the aboriginal production of milling implements.

Shott, Michael (Northern Iowa)

[15] MORTAL POTS: ON USE LIFE AND VESSEL SIZE IN THE FORMATION OF CERAMIC ASSEMBLAGES

We know a great deal about how prehistoric pots were made and used, but surprisingly little about how long they lasted in service. Vessel use life, however, is an important component of ceramic assemblage formation. Use life data from seven major and ten additional ethnoarchaeological sources show that the directly measurable "primitive property" of vessel size—in its various dimensions—is positively related to use life. Results offer the provisional prospect of estimating use life of archaeological unknowns from their size, thereby improving the quality of archaeological inferences from the material record.

Starratt, H. (see Toscano-Hernandez, L.) [31]

Stein, J. (see Lewarch, D.) [101]

Stevens, J. Sanderson (John Milner)

[68] ARCHAEOLOGICAL DATA RECOVERY AT THE WATERFALL SITE (191-5-1), ATHENS, NEW YORK

The Waterfall Site, a multi-component campsite in the Town of Athens, New York was sporadically occupied between the Late Archaic and Late Woodland periods. The most significant occupation, attributable to the Sylvan Lake complex (2400 to 1900 B.C.), is represented by Lamoka, Bare Island, Wading River, and Narrow Stemmed points. Identification of activity areas and lithic analyses indicate various activities occurred including hunting, biface reduction, and food preparation. Although Onondaga and Normanskill cherts dominate the debitage, Esopus chert, a local but rarely utilized material, constitutes 9% of the assemblage. Site location, tool assemblage, and site function suggest the site represents an unidentified type in the Sylvan Lake settlement system.

Storey, Glenn (Penn State)

[30] THE HEIGHT OF BUILDINGS IN ANCIENT ROME: NEW ARCHAEOLOGICAL DATA

How tall were the buildings of ancient Rome? The traditional view, based on the Roman ethnographic record, is that structures in Rome could soar as high as 10 stories. Roman archaeologists have applied a "rule of thumb" relation predicting the height of buildings no longer extant from the thickness of their ground floor foundation walls. Recently, archaeological data to test this relation were gathered and analyzed on site in Rome, Pompeii, Ostia and Herculaneum. Results strongly suggest that the rule of thumb relation is unreliable, leaving sufficient reason to question that buildings were as high in ancient Rome as often assumed.

Sweeney, Maria and David Addison (Hawaii-Manoa)

[30] CURRENT EAST POLYNESIAN CHRONOLOGY

The advent of radiocarbon dating in the 1950's enabled archaeologists to challenge assumptions about Polynesian prehistory. While work on creating a culture historical sequence for Polynesia using artifacts is still being pursued, radiocarbon dating is still the basis for determining chronology in the islands. To date, a fair number of radiocarbon age determinations associated with human activity are available to construct a picture of the colonization and settlement in the area known as East Polynesia. The current sequence as well as problems remaining in our understanding of East Polynesian prehistory, will be illustrated.

Swenson, F. (see Gregg, M.) [101]

Tainter, Joseph (USDA Forest Service)

[69] A CULTURAL RESOURCES PROGRAM FOR THE MONTS MANDINGUES FOREST, MALI, WEST AFRICA

In 1990 the Cibola National Forest, Albuquerque, New Mexico, was invited to become a Sister Forest to the Monts Mandingues Forest near Bamako, Mali. Among the areas for which this forest requested technical assistance is cultural resource management. The forest consists of dissected plateaus, gallery forests, and Niger River floodplain, and is near the capital of the medieval Empire of Mali. The archaeology ranges from Neolithic rockshelters to recent fortified compounds. In addition to training Monts Mandingues personnel in site identification, protection, and interpretation, this project will produce the first systematic assessment of the archaeology of this part of Mali.

Toscano-Hernandez, Lourdes, Carlos Perez Alvares (INAH Centro Regional Yucatan) and Harold Starratt (Tulane)

[31] POPULATION DYNAMICS IN THE PUUC: CURRENT INVESTIGATIONS AT THE CLASSIC SITE OF LABNA, YUCATAN

Much emphasis has been placed on the large sites in the Northern Maya Lowlands, yet the more numerous minor sites of the area may yield a better overall picture of Maya lifeways of the Classic period. Labna is a small site in the Puuc region of northwestern Yucatan which has been the subject of two field seasons of research sponsored by INAH. The focus of this research has been on the techniques of architectural construction, and a description of settlement patterns in the Late Classic. Our goal is to gain insight into the cultural transitions at this site as well as to define its place among the other Puuc settlements.

Trubitt, Mary Beth (Northwestern)

[84] PRODUCTION AND DISTRIBUTION OF SHELL BEADS IN MISSISSIPPIAN COMMUNITIES

Although the final disposal of marine shell beads was often in status burials in the American Bottom (Illinois) region in the late prehistoric period, production was in household or workshop contexts. This study examines the byproducts of bead manufacture and their distribution in household midden in rural Mississippian communities. The correlation between bead manufacturing debris and household status suggests two possible production and distribution paths: [1] beads were produced in higher status households; and [2] beads moved from lower status to higher status households, possibly in gift exchanges.

Truncer, James (Washington)

[84] A CHEMICAL CHARACTERIZATION OF MIDDLE ATLANTIC STEATITE QUARRIES

A cost-benefit analysis of prehistoric steatite vessel manufacture in the Middle Atlantic region is proposed. Distance between the source and the location of finished steatite vessels is used as a measure of transport cost. Approximately 90 samples of steatite from prehistoric quarries were analyzed using instrumental neutron activation analysis at the National Institute of Standards and Technology, (Gaithersburg, MD), to quantify the chemical variability of steam sources. Results indicate that it is possible to discriminate among quarries by plotting concentrations of iron, scandium, and chromium in addition to rare earth elements.

Van Dyke, Ruth (Arizona)

[30] IDEOLOGY AND THE ANCIENT CHINESE STATE

State formation and maintenance require consolidation of political, economic, and societal power. Ideology and the societal realm, as depicted in textual sources, figured preeminently in the rise and perpetuation of the Han Chinese state (202 B.C.–A.D. 200). Han Confucian scholars evolved into a relatively autonomous class of intellectual and bureaucratic elite (*literati*). Confucian philosophy legitimized power relations through control of the educational process and through advocacy of strict adherence to rituals and existing behavioral norms. The *literati* perpetuated ideologies of continuity and reproduced themselves as a class, enabling the endurance of a Chinese polity for two millennia.

Vernon, Robert (MicroLithic Technologies)

[15] COMPUTER-AIDED VISUALIZATION OF INTRA-SITE ACTIVITY PATTERNS

Microcomputer graphics techniques adapted from the desktop video production, desktop image publishing, remote sensing, and desktop visualization disciplines were applied to archaeological data and have revealed patterns indicative of prehistoric human activities. The presentation will feature a “hands-on” demonstration of a new, portable microcomputer visualization system which features animated, color-enhanced representations of superimposed patterns within multivariate data sets. A computer-generated videotape of unexpected activity pattern relationships within the data from 41UV159, a burned rock midden site excavated by the 1990 Field School of the Texas Archaeological Society will also be shown.

Victor, Katharine (Sydney) and Timothy Baugh (Smithsonian)

[54] OBSIDIAN FROM NEW MEXICO PUEBLOS: IMPLICATIONS FOR PROTOHISTORIC PLAINS-PUEBLO INTERACTION

While interaction between the Pueblos and the Plains during the Protohistoric period is well documented, less is known regarding the relationships between specific sites of the two regions. Through ICP analysis of obsidian from several Pueblo sites and femez sources our study seeks to elucidate patterns of obsidian acquisition in the two regions.

Walters, D. (see Neff, H.) [101]

Waters, Michael, John Giardino and James Parrent (Texas A&M)

[15] GEOARCHAEOLOGICAL INVESTIGATIONS OF ST. ANN'S BAY, JAMAICA: THE SEARCH FOR THE COLUMBUS CARAVELS AND AN ASSESSMENT OF 1000 YEARS OF HUMAN LAND USE

Geoarchaeological investigations of St. Ann's Bay, Jamaica, show that the two caravels abandoned by Christopher Columbus in A.D. 1504 are buried in the shallow bay muds immediately offshore of the modern beach. Stratigraphic studies also show that there were two periods of rapid sedimentation during the last 5000 years, one from A.D. 1000 to 1300 (lagoon filling) and the second between A.D. 1700 and modern times (bay filling). The prehistoric introduction of agriculture to Jamaica around A.D. 900 and later European intensification of agriculture appear to be the cause of these two episodes of increased sedimentation.

Webb, Paul (Garrow & Associates, Inc.)

[68] RECENT INVESTIGATIONS ALONG THE ROELIFF JANSEN KILL

Recent survey and excavations conducted for the Iroquois Pipeline Project have produced considerable new data concerning prehistoric occupations along the Roeliff Jansen Kill, a large but previously little studied tributary of the Hudson River. Survey data from 20 sites are summarized, but this presentation focuses on data recovery excavations at three sites with major Late Woodland components, which are poorly known in the Hudson drainage. Data on ceramic types, lithic resource preferences, and subsistence practices are summarized and compared with Late Woodland manifestations elsewhere in the Hudson Valley and the Northeast.

Webb, P. (see Cassidy, D.) [68]

Webb, P. (see Garrow, P.) [68]

Weiss, Andrew (University Museum of Pennsylvania)

[30] THE SOCIAL CONTEXT OF LARGE SCALE COPPER PRODUCTION IN PREHISTORIC CENTRAL THAILAND

Five seasons of fieldwork by the Thailand Archaeometallurgy Project in Central Thailand has revealed the presence of large scale copper production beginning around 1500 B.C. At ca. 700–500 B.C. during a period in Southeast Asia that saw increasing social complexity, production shifted from small copper ingots and tools, to small socketed objects that appear to be projectile points. Current data suggests that production was performed by numerous small groups of independent craft specialists rather than centralized production controlled by a larger political or economic entity. Some evidence suggests contacts with coastal sites, and possibly to northern Vietnam.

White, D. (see Hohman, J.) [54]

Wilke, P. (see Schneider, J.) [15]

Wilke, P. (see Arkush, B.) [101]

Yelton, Jeffrey (Southwest Missouri)

[15] ARCHAEOLOGY AND NON-PROFESSIONAL EDUCATION IN SOUTHWESTERN MISSOURI

Public education about the past is of growing importance. The Center for Archaeological Research, Southwest Missouri State University, recently provided educational services in two programs aimed at different generations. In cooperation with Springfield Public Schools, students excavated a pioneer farmstead dating to 1830. As part of a Passports-in-Time project, CAR and Forest Service archaeologists helped adult volunteers survey a Mark Twain National Forest wilderness area for potentially endangered sites. In both instances, the emphasis was not on training non-professionals on how to do fieldwork but on why the past needs to be studied and preserved.

Yelton, Jeffrey (Southwest Missouri)

[101] THE BOONE'S LICK SITE: EARLY NINETEENTH-CENTURY INDUSTRY ON THE FRONTIER

Often, the American frontier is conceptualized as a wave of farmers. Actually, many Euro-American settlers west of the Mississippi were entrepreneurs. An excellent example is Missouri's Boone's Lick site. During the early 1800s, workers produced thousands of pounds of salt. Excavations, funded by the Missouri Department of Natural Resources, reveal much about the procurement technology. The spring box and other wooden devices have been preserved by the marshy conditions. The complex, hand-pegged-plank box supported a tread wheel, which sent water, via flumes, to trench furnaces. The wooden artifacts have since been conserved by the sucrose method.

Young, Amy (Tennessee)

[84] RECENT ARCHAEOLOGICAL INVESTIGATIONS AT LOCUST GROVE PLANTATION

Since 1987 archaeological investigations have been conducted at Locust Grove, a restored 19th century plantation. Much of the work has been aimed specifically at recovering data pertinent to reconstructing slave life on this small plantation located on the Ohio River just outside Louisville Kentucky. Three slave cabin sites have been excavated and analysis is ongoing. Preliminary results from analysis of the ceramics appear promising. Decorated ceramics from the three slave cabins have been compared to those recovered at the main house to investigate ceramic acquisition. This poster presents these results and describes some of the architectural features associated with the slave cabins.

Zorich, D. (see Beck, L.) [15]

Zschomler, Kristen (Institute for Minnesota Archaeology) and Clark Dobbs (Institute for Minnesota Archaeology)

[15] PROMOTING PUBLIC OWNERSHIP OF THE PAST

For many reasons it is essential that the public take an increasing role in the "ownership" of our collective past. The Institute for Minnesota Archaeology has developed a three-part strategy for public education programming. We involve the public through on-site tours, excavations, teachers workshops, school presentations, and participation in site stewardship. We present our results by brochures on individual sites and video's on specific themes. We maintain continuity with our public by stressing that archaeology is question driven and that our results generate new questions to answer.