

Wing

Program  
and Abstracts

SOCIETY FOR  
AMERICAN ARCHAEOLOGY

FORTY-FIFTH ANNUAL MEETING

Philadelphia, Pennsylvania

May 1-3, 1980

Forty-Fifth Annual Meeting

## SOCIETY FOR AMERICAN ARCHAEOLOGY

*Program Chair:* Ernestene L. Green

*Review Committee:* James Ayres, Roy Dickens, Donald Grayson, William Lipe

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## OFFICERS OF THE SOCIETY FOR AMERICAN ARCHAEOLOGY

*President:* Fred Wendorf

*President-elect:* R. E. W. Adams

*Secretary:* Alfred E. Johnson

*Secretary-elect:* James Ayres

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*Editor:* Jeremy Sabloff

*Executive Committee Members:* Ernestene L. Green, David A. Breternitz (to 1980), Donald Grayson, Leslie Davis (to 1981)

## GENERAL INFORMATION

**Abstracts** Abstracts of papers presented at this meeting are included in the *Program*. Additional copies are available for \$2.00 per copy at the registration desk or may be ordered prepaid from the Society, 1703 New Hampshire Avenue, NW, Washington, DC 20009.

**Business Meeting** The Society's annual business meeting will begin at 5:30 pm on Friday in the Grand Ballroom.

**Convention Office** Any problems or special requests during the meeting should be reported to the registration desk.

**Exhibits** Publishers' book exhibits will be displayed in the Delaware Valley Suite from 5 pm to 8 pm on Wednesday, 9 am to 6 pm on Thursday and Friday, and 9 am to noon on Saturday.

**Membership Services and Publications** A desk will be maintained on the third floor during the registration hours for those who wish to purchase publications or enroll in the Society.

**New Member Reception** Officers of the Society will host a reception for new members and for those attending their first meeting on Friday at 8 pm in the Constitution Room.

**Open House** Everyone is invited to an open reception (cashiered bar) on Thursday at 5 pm on the Tiered Balcony.

**Placement Service** A placement service will be conducted in Rooms 540-546 from 5 pm to 8 pm on Wednesday and from 8 am to 5 pm on Thursday through Saturday. Positions open or wanted may be listed with the service throughout the meeting. Message forms will be provided, and box numbers will be assigned for use in the placement service message center.

**Reception** The University Museum of the University of Pennsylvania invites the members of the Society to a reception (cashiered bar) in the Chinese Rotunda at the University Museum, 33rd and Spruce Streets, from 7 pm to 10 pm on Wednesday.

**Registration** Registration, which includes a copy of the *Program and Abstracts* is required for attendance at all sessions. Registration desks will be open on the third floor from 5 pm to 8 pm on Wednesday, 8 am to 4 pm on Thursday and Friday, and 8 am to noon on Saturday. Members who pre-registered by April 16 should claim their badges and programs at the *advance registration* desk.

**Symposia and Session Chairs** Please maintain the established schedule scrupulously in fairness to persons planning to attend sessions at specific times to hear particular speakers; please pause for the period allotted in the program if a scheduled speaker fails to appear.

**Meeting Room Directory** Second Floor: East Ballroom, West Ballroom (Grand Ballroom), Cafe Careme, Tiered Balcony; Third Floor: Constitution, Independence, Pennsylvania East, Pennsylvania West, '76 Room, Delaware Valley Suite, Sheraton; Fifth Floor: Rooms 540-554.

## PROGRAM

### THURSDAY MORNING, MAY 1

9:00 SOCIETY FOR AMERICAN ARCHAEOLOGY  
Sheraton  
Meeting of the Executive Committee

9:00 Poster Session: Thursday, Friday, and Saturday  
Tiered Balcony  
Chairperson: Charles M. Baker

Participants:

Emil Veakis, Trace Element Analysis of Native Copper in Prehistoric North America  
Bruce Bevan, Recent Examples of Geophysical Exploration  
Charles M. Baker, Lithic Assemblage Variability Among Sites in the Upper Mimbres  
Wayne E. Wiersum, The Mitigation Strategy for a National Register Site in the Aleutian Islands: Chaluka  
Lawrence P. Allen, The Depositional History of the Simms Pond Site, CA-LAN-702, A Shell Midden on Alamitos Bay, Long Beach, CA  
Robert Gal, Peter Bowers, Michael Kunz, Recent BLM Archeological Field Work in the National Petroleum Reserve North Slope Alaska: A Preliminary Report

(1) Symposium: SOCIO-ECONOMIC CHANGE IN RANKED SOCIETIES, PART I: RANKING, PRESTIGE AND EXCHANGE

West Ballroom

Organizer: A. C. Renfrew

Chairpersons: A. C. Renfrew and R. K. Evans

Participants:

- 8:15 Colin Renfrew, Dominance and Subordination: A Spatial Analysis  
8:35 Susan Shennan, From Minimal to Moderate Ranking, or How Some Became More Equal than Others  
8:55 R. W. Chapman, Autonomy, Ranking and Resources in Iberian Prehistory  
9:15 Stephen Shennan, Exchange and Ranking: The Case of Amber  
9:35 Sara Champion, Exchange and Ranking: The Case of Coral  
9:55 C. Haselgrove, The Socio-Economic Context of Political Centralization in Late Iron Age Britain  
10:35 C. Arnold, Stress as a Stimulus for Socio-Economic Change: Anglo-Saxon England in the Seventh Century  
10:55 R. A. Hodges, The Evolution of Gateway Communities: Their Socio-Economic Implications  
11:15 R. Bradley, Prestige Trade, Agriculture and Social Change: Some European Examples  
Discussants: I. Hodder, R. Whallon

(2) Symposium: RECENT ARCHAEOLOGICAL RESEARCH IN LOWER CENTRAL AMERICA

East Ballroom

Organizers: Winifred Creamer and Lynette Norr

Chairperson: Lynette Norr

Participants:

- 8:30 Jane Day, Using a Private Collection of Ceramics for Research in Costa Rican Prehistory  
8:50 Lynette Norr, Bone Chemistry and Prehistoric Diet: Initial Results from Costa Rica  
9:10 Bob Drolet, A Basalt Cobble Industry Along the Moist Slopes of Caribbean, Eastern Panama  
9:30 Catherine S. Einhaus, Questions on the Formative of Western Panama  
9:50 Frederick W. Lange, Pacific Coastal Ceramics in Highland Costa Rican Mortuary Contexts: Commerce or Ritual?  
10:20 Peter Ryder, Mojica: An Early Polychrome Cemetery in Northwestern Costa Rica  
10:40 Michael J. Snarskis, La Cabana: Plaza-Plan Architecture in the Tropical Rain Forest of Eastern Costa Rica  
11:00 John Hoopes, Evidence of a Prehistoric Wattle-and-Daub Structure at the Site of La Guinea, Guanacaste, Costa Rica  
Discussants: Frederick W. Lange, Anthony J. Ranere

(3) Symposium: PLANT OPAL PHYTOLITH ANALYSIS: APPLICATIONS IN ARCHAEOLOGICAL RESEARCH

Cafe Carême  
Organizer and Chairperson: Irwin Rovner

Participants:

- 8:00 Irwin Rovner, The History and Development of Plant Opal Phytolith Analysis  
8:20 Susan Collins, John Gifford, George Rapp Jr., and Margaret Thomson, Phytolith Systematics  
8:40 Patricia Palmer and Alice Tucker, A SEM Survey of Silica Bodies and Other Anatomical Features of Grass Leaves  
9:00 William A. Starna, Currie D. Marr, and Donald Kane, Plant Opal Phytolith Analysis at the Street Site, Otsego City, NY: A Progress Report  
9:20 Victor A. Carbone, Phytolith Research in the Shenandoah Valley, Virginia  
9:40 Rhoda Owen Lewis, Opal Phytoliths in Archaeological Sites: Current Research in the High Plains  
10:20 Ralph L. Robinson, Environmental Chronology for Central and South Texas: External Correlations to the Gulf Coastal Plain and the Southern High Plains  
10:40 Arlene V. Miller, Phytoliths as Indicators of Farming Techniques  
11:00 Dolores R. Piperno, Phytolith Evidence of Maize Cultivation in Central Panama during the Early Ceramic (Monagrillo) Period  
11:20 Deborah M. Pearsall, Phytolith Evidence of Achira and Maize Cultivation in Formative Ecuador  
Discussant: J. Schoenwetter

(4) Symposium: EXPLANATIONS IN HISTORY: PLAINS HISTORICAL ARCHAEOLOGY

Pennsylvania East  
Organizers and Chairpersons: Marcel Kornfeld and Larry C. Todd

Participants:

- 8:00 Ken Erickson and William B. Fawcett, Historical Archaeology at a Union Pacific Railroad Station in the Red Desert of Wyoming  
8:15 William G. Buckles, Relationship of the Colorado Mining Frontier and a Plains Cultural Pattern  
8:30 Jack L. Hofman, Exploring Intrasite Patterning on Historic Shepherders' Camps  
8:45 Larry C. Todd, Patterns in the Distribution of Sites Within a Historic Settlement System  
9:00 Marcel Kornfeld, Plains Historic Archaeology: Identifying Environmental Variability of Settlement Patterning  
9:15 Robert L. Kelly, Intra-Settlement Pattern Variation, Its Recognition and Significance: A Case Example from Historic Sheep Camps  
Discussants: George C. Frison, Joseph J. Lischka

(5) General Session: METHOD: PART I

Pennsylvania West  
Chairperson: Joan H. Geismar

Participants:

- 8:00 Thomas J. Banks, Archaeological Survey by Mule-back  
8:20 Randolph E. Donahue, Rounding Off the Corners of Intensive Surface Sampling  
8:40 James Merritt and Brian Butler, Historic Debris Scatters Without Structural Remains  
8:50 Joan H. Geismar, Surface Collection as an Effective Field Method for Analysis of Skunk Hollow, a Community Site  
9:00 Dorothy Schlotthauer Krass, Small Artifacts and Windblown Sites  
9:20 Alice W. Portnoy, Effective Use of Personal Experience in the Field  
9:40 Patricia Hansell and John Adams, The Application of Sediment Analysis to Cultural Deposits  
10:00 Gerald Holly, Archaeological Taphonomy  
10:20 Gifford E. Tiedmann and Bruce G. Gladfelter, A Computer Program for Evaluating Spatial Archaeological Data  
10:40 Jane E. Bulksra and Mark Swegle, New Experimental Evidence Concerning the Impact of Burning on Bone  
10:50 Diana Craig Patch, Application of Freshwater Shell in Archaeological Research  
11:00 George R. Clark II, Molluscan Growth Lines: Theory, Techniques, and Potential Applications in Archaeology  
11:10 Christopher L. Borstel, Floodplain Sites, the Chronostratigraphic Method and Perceptions of the Past

- 11:30 Vance T. Holliday, Some Application of Pedology to Archaeological Research  
11:40 Dennis E. Lewarch and Michael J. O'Brien, The Effect of Short Term Tillage on Aggregate Provenience Artifact Pattern

(6) Symposium: COMPUTERIZED DATA BANK MANAGEMENT IN ARCHAEOLOGY

Constitution  
Organizers and Chairpersons: Sylvia W. Gaines and W. Fredrick Limp

Participants:

- 8:00 Dee F. Green, Approaches to Mass Archaeological Data Storage: The USDA Forest Service System  
8:15 Walter Wait, San Juan Basin Data Base  
8:30 Sandra Scholtz, Information System Design for Cultural Resource Management  
8:45 W. Fredrick Limp, Current Directions in Computerized Data Management in Midwestern Archaeology  
9:00 Fred Plog, SARG: A Research Oriented Data Bank  
9:15 Sylvia W. Gaines, Recent Trends in Computer Technology and Their Role in Archaeological Data Bank Applications  
Discussants: Linda Cordell, Robert G. Chenhall

(7) Symposium: PROBLEMS OF LARGE SCALE, MULTIDISCIPLINARY REGIONAL ARCHAEOLOGICAL RESEARCH: THE MALYAN PROJECT

Independence  
Organizer and Chairperson: William M. Sumner

Participants:

- 8:00 William M. Sumner, The Malyan Project: Introduction  
8:15 Christopher Hamlin, Satellite Remote Sampling of the Marv Dasht Plain  
8:30 M. James Blackman, Long Range and Local Exchange Patterns in Southern Iran  
8:45 Naomi Miller, Paleoethnobotanical Studies at Malyan  
9:00 Melinda Zeder, Animal Resource Distribution and Urban Development in Southern Iran  
9:15 Janet W. Nickerson, Kaftari Period Human Figurines from Tal-e Malyan, Iran  
9:30 Holly Pittman, The Glyptic Art of the Kaftari Period of Tal-e Malyan  
9:45 Michael Rosenberg, Paleolithic and Early Neolithic Settlement in the Marv Dasht, Iran  
10:15 Joseph Kole, Bakun Period Settlement Patterns  
10:30 John R. Alden, Banesh Period Settlement  
10:45 Ilene M. Nicholas, A Spatial-Functional Analysis of the Banesh Occupation at Malyan: The TUV Operation  
11:00 John L. Nickerson, Analysis of the Spatial-Functional Intra-Site Variability Present in the Kaftari Period Occupation at Tal-e Malyan, Iran  
11:15 Linda K. Jacobs, The Breakdown of Lowland Hegemony in the Highlands of Iran in the Mid-Second Millennium, B.C.  
11:30 Elizabeth Carter and Joan Carothers, The Middle Occupation at Malyan  
Discussants: Henry Wright, Robert H. Dyson Jr.

(8) Symposium: PRE-HISPANIC HABITAT, AGRICULTURE, AND SETTLEMENT OF THE PULLTROUSER SWAMP ZONE, NORTHERN BELIZE

'76 Room  
Organizers: B. L. Turner II and Peter D. Harrison  
Chairperson: B. L. Turner II

Participants:

- 8:00 B. L. Turner II, Raised Field Agriculture and Environs at Pulltrouser Swamp  
8:20 F. J. Wiseman, Pollen Analysis of Raised Fields at Pulltrouser Swamp, Belize  
8:40 P. D. Harrison, The Pilot Settlement Study of the Pulltrouser Project  
9:00 Nancy Ettlinger, Excavations of the Pulltrouser Swamp-Raised Field Project: The Southern Area  
9:20 R. E. Fry, Ceramic Chronology for Raised Fields at Pulltrouser Swamp and Adjacent Settlement Areas  
Discussant: Charles Miksicek

(9) ASCA Symposium: ARCHAEOLOGY IN STATE PLANNING FOR HISTORIC PRESERVATION

Pennsylvania East  
Organizer and Chairperson: Margaret M. Lyneis

Participants:

- 10:00 Lawrence E. Aten, Historic Preservation Planning: The Need and Promise  
10:15 Valerie Talmage, A Model for Management  
10:30 Hester Davis, A State Plan for Archaeology in Arkansas  
10:45 Thomas Green, State Planning for Archaeology: The Idaho Example  
11:00 Francis P. McManamon, Articulations Between NPS Regional Archaeology Programs and State Preservation Planning  
11:15 A. E. Rogge, Evolution of Agency Compliance: A Case Study  
11:30 Thomas F. King, Resources Protection and the State Plan: A Programmatic Relationship

(10) Symposium: CULTURAL RESOURCE MANAGEMENT ON THE OUTER CONTINENTAL SHELF

Constitution  
Organizer and Chairperson: Tye Roy

Participants:

- 10:00 Tye Roy, Development and Present Status of the Cultural Resource Management Program on the Outer Continental Shelf  
10:20 Wink Hastings, Cultural Resource Management on the Alaskan Outer Continental Shelf  
10:40 Sherwood M. Gagliano, Approach to Drowned Terrestrial Site Archaeology, Northern Gulf of Mexico Continental Shelf  
11:00 Michael Roberts, A Summary and Analysis of Cultural Resource Information of the Continental Shelf from the Bay of Fundy to Cape Hatteras  
11:20 Rey Ruppe, An Assessment of the Marine Archaeological Survey Program of the Bureau of Land Management Outer Continental Shelf Program  
11:40 Melanie J. Stright, Archaeology on the Outer Continental Shelf: Problems and Potential

(11) Symposium: ARCHAEOMAGNETISM: PROSPECTS FOR IMPROVING TIME CONTROL IN ARCHAEOLOGY

'76 Room  
Organizer: Jeffrey L. Eighmy  
Chairperson: Robert L. DuBois

Participants:

- 10:00 Robert L. DuBois, Sheng-Shyong Lee, Tien Shaing Hsue, and Travis Tull, Ancient Geomagnetic Intensity in Mesoamerica and Southwestern United States—A Useful Chronological Base?  
10:15 Thomas Windes, Archaeomagnetic Dating: Lessons from Chaco Canyon, New Mexico  
10:30 Randall H. McGuire, Robert S. Sternberg, and Robert F. Butler, Exchange of Archaeomagnetic Information Between the Archaeologists and Geophysicist  
10:45 Jeffrey L. Eighmy, Kenneth J. Berry and Paul W. Mielke, Testing Contemporaneity: A New Statistic for Comparing Archaeomagnetic Samples  
11:00 George J. Krause, Archaeomagnetic Orientation Methods: A Comparison Between Sun Compass and Magnetic Compass Measurements  
11:15 Robert S. Sternberg, Robert F. Butler and Randall H. McGuire, Some Paleomagnetic Considerations for Archaeomagnetic Dating  
Discussant: Daniel Wolfman

THURSDAY AFTERNOON, MAY 1

(12) Symposium: SOCIO-ECONOMIC CHANGE IN RANKED SOCIETIES PART II: PRODUCTION, DISTRIBUTION, AND LAND-USE

West Ballroom  
Organizer: A. C. Renfrew  
Chairpersons: A. C. Renfrew and P. Phillips

Participants:

- 1:00 J. Gledhill and M. J. Rowlands, Materialism and Socio-Economic Process in Multi-linear Evolution  
1:20 A. Sherratt, Density, Distance and Interaction: The Problem of Scale  
1:40 C. S. Gambles, "Surplus" Production and Leadership

- 2:00 P. Halstead and J. O'Shea, A Friend in Need is a Friend Indeed: Social Storage and the Origins of Social Ranking  
2:20 J. Bintliff, Settlement Patterns, Land Tenure and Social Structure: A Diachronic Model  
2:40 G. Barker, Socio-Economic Change versus the Italian Peasant  
3:20 A. Fleming, Social Boundaries and Land Boundaries  
3:40 J. Collis, Gradual Growth and Sudden Change: Urban Settlement in Temperate Europe in the Late Iron Age  
4:00 T. C. Champion, Fortification, Ranking and Subsistence  
4:20 K. Randsborg, Rank, Rights and Resources  
Discussants: Ruth Tringham, L. R. Binford

(13) General Session: MODERN MATERIAL CULTURE

East Ballroom  
Chairperson: Nan A. Rothschild

Participants:

- 1:00 Alan Marks, Gordon Bronitsky, and Cindy Burleson, Praise the Lord and Compare the Data: Material Culture of Religion  
1:20 Gordon Bronitsky, Religion in West Texas: A Modern Material Culture Field School  
1:40 Nan A. Rothschild, Pennies from Denver (Evidence for a War Between Denver and New York City?)  
1:50 Louana M. Lackey, Cherry Blossoms, President's Plates, and *Chi War!*: Souvenir Collecting in Washington, D.C.

(14) Symposium: ARTIFACT ANALYSIS AND BEHAVIORAL INFERENCE

Cafe Careme  
Organizer and Chairperson: Judith A. Rasson

Participants:

- 1:00 Ruth Tringham, Research Design and Planning Behavioral Analysis  
1:20 Cheryl P. Claassen-MacClelland, Artifact Analysis and Behavioral Inference: Reused Artifacts  
1:40 Harvey Bricker, The Uses of the Past: Neolithic Reworking of Paleolithic Flint Artifacts  
2:00 Barbara Voytek, Analysis of Chipped Stone Assemblages and Microwear  
2:20 Timothy Kaiser, Maximizing Behavioral Inferences from Non-Diagnostic Ceramics  
3:00 Judith A. Rasson, Sand Tempered Ceramics and Fourier Shape Analysis  
3:20 Nerissa Russell, Modified Bones and Behavioral Analysis  
3:40 Carol S. Spears, Collecting Data to Relate the Archaeological Context to the Systemic Context: Approaches to the Study of Non-Siliceous Stone Utilization  
4:00 Petar Glumac, Behavioral Implications of the Physical Examination of Metallurgical Data  
Discussants: Charles Redman, Alan McPherron

(15) Symposium: EARLY COASTAL ADAPTATIONS IN THE CENTRAL AREA AND ADJACENT REGIONS

Pennsylvania East  
Organizers: Karen E. Stothert and Anthony Ranere  
Chairperson: Karen E. Stothert

Participants:

- 1:30 Emily R. Lundberg and Linda Sickler Robinson, Early Adaptive Trends in the Island Environment: A Study from St. Thomas  
1:50 Anthony Ranere, Richard G. Cooke, and Pat Hansell, Food Procurement in the Parita Bay Region of Panama: 5000 B.C. to A.D. 500  
2:10 Karen E. Stothert, The Earlier Vegas Adaptation of Southwest, Coastal Ecuador  
2:30 Elizabeth S. Wing, Animal Use as One Aspect of Early Coastal Adaptation  
3:20 James B. Richardson, Modeling the Development of Sedentary Maritime Economies on the Coast of Peru  
Discussants: Irving Rouse, Olga Linares, Barbara Voorhies

(16) General Session: METHOD AND THEORY: PART I

Pennsylvania West  
Chairperson: Alice Kehoe

Participants:

- 1:00 James F. Kerrigan, A Study of the Archaeological Record  
1:20 Alice B. Kehoe, A Less Procrustean Periodization of North American Prehistory

- 1:40 Michael R. Walsh, The Classification of Topography: A Stratified Universe  
 2:00 Robert B. Neily, The Prehistoric Community: A Theoretical, Methodological, and Comparative Regional Approach  
 2:20 Alexandra M. Ujana Klymyshyn, In Search of Urban Origins  
 2:40 Paul A. Raber, The Technological Basis of Chiefdoms  
 3:00 Arthur S. Keene and William K. MacDonald, Whatever Happened to the New Archaeology: An Examination of the Recent History of Archaeological Approaches in North America and Their Relationship to Anthropology  
 3:20 Guy E. Gibbon, Positivism and the New Archaeology  
 3:30 Kathleen T. Henderson, Social Interaction and Organizational Change: A Diachronic Perspective  
 3:40 Mallison Wylie, Analogic Argument in Archaeology  
 4:00 Jon Muller, Generation After Generation: Formal Descriptive Models in Archaeology  
 4:20 Rebecca Storey, Chiefdom Society in Demographic Perspective  
 4:40 Richard W. Redding, Seasonal Change in Herding Strategies: Implications for Dynamic Modeling of Production Processes  
 5:00 Suzanne M. Spencer-Wood, The Development of an Urban Archaeological Predictive Model
- (17) Symposium: CHIPPED STONE ANALYSIS AND THE RECONSTRUCTION OF PREHISTORIC SUBSISTENCE SYSTEMS  
 Constitution  
 Organizers and Chairpersons: Margaret C. Nelson and Susan E. Blake  
 Participants:  
 1:00 David Pokotylo, Lithic Technology in Regional Perspective: Implications of Locational Patterning in Lithic Debitage  
 1:20 Andrew A. Nickelhoff, Prehistoric Lithic Technology and Subsistence in the Red River Gorge, Kentucky  
 1:40 John E. Clark, An Approach to the Study of Chipped Stone Tool Function in Mesoamerica: A Program for Chiapas, Mexico  
 2:00 Margaret C. Nelson, Formal Variation of Chipped Stone Tools as a Measure of Subsistence Change  
 2:20 Douglas B. Bamforth, Stone Tool Function at Lubbock Lake: Beyond Bison Procurement in Great Plains Prehistory  
 2:40 William J. Parry, The Use of Edge Morphology in Functional Classification of Chipped Stone Tools  
 3:20 Albert C. Goodyear, General Aspects of PaleoIndian Adaptations in North America: A View Through the Raw Material  
 3:40 Susan E. Blake, Lithic Raw Material Variation and Changing Subsistence in the Mimbres Valley, New Mexico  
 Discussant: Payson Sheets and Lawrence Keeley
- (18) Symposium: COLHA, BELIZE: A CHERT TOOL MASS PRODUCTION CENTER OF THE ANCIENT MAYA LOWLANDS  
 Independence  
 Organizers and Chairpersons: Thomas R. Hester and Harry J. Shafer  
 Participants:  
 1:00 Thomas R. Hester, The Colha Project: Investigation of Ancient Chert Tool Mass Production Center in the Maya Lowlands  
 1:20 R. E. W. Adams and F. Valdez Jr., The Ceramics of Colha, 1979-1980 Seasons  
 1:40 Harry J. Shafer, Lithic Workshops at Colha and Preclassic Craft Specialization  
 2:00 Jack D. Eaton, Architecture and Settlement at Colha  
 ~2:20 R. F. Scott IV, Faunal Research at Colha  
 Discussant: R. E. W. Adams
- (19) General Session: SOUTH AMERICA  
 '76 Room  
 Chairperson: D. W. Lathrap  
 Participants:  
 1:00 Jose R. Oliver, Quebrada Balerio: A New Saladoid Style in Paria, Venezuela  
 1:10 Donald A. Proulx and Richard D. Daggett, Early Horizon Sites in the Nepeña Valley, Peru  
 1:20 Jorge G. Marcos, Colin McEwan, and Presley Norton, Recent Field Research on the Central Coast of Ecuador
- 1:40 Patricia Netherly, Olaf Holm, Jorge Marcos, and Paul Marca, Survey of the Arenillas Valley, El Oro Province, Ecuador  
 2:00 Izumi Shimada, Batán Grande and the Evolution of the Lambayeque Culture: Religious and Economic Considerations  
 2:10 Christine Pickett, Theoretical and Methodological Considerations in Middle Horizon Cultural Interaction
- (20) General Session: WESTERN UNITED STATES  
 Independence  
 Chairperson: Kenneth M. Ames  
 Participants:  
 3:30 David T. Clark, Subsistence and Settlement at Pyramid Lake, Nevada  
 3:40 Lonnie C. Pippin, Aboriginal Patterns of Pinyon-Juniper Zone Resource Exploitation on the Nevada Test Site  
 3:50 Kenneth M. Ames, The Development of Villages in Western North America  
 4:10 Donald A. Graybill, Archaeological and Paleoclimatological Utility of Bristlecone Pine in the Great Basin
- (21) Symposium: ARCHAEOLOGICAL SITE PROTECTION IN THE PRIVATE SECTOR: PROBLEMS AND PROSPECTS  
 '76 Room  
 Organizers: Glenn F. Tiedt and Steven A. LeBlanc  
 Chairperson: Glenn F. Tiedt  
 Participants:  
 3:00 Mark R. Barnes, Preservation of Archaeological Sites Through Acquisition  
 3:20 Geoffrey M. Gyrisco, Cases of Direct and Incidental Protection of Archaeological Sites Through Easements  
 3:40 Glenn F. Tiedt, Federal Income Tax Consequences of Gifts of Archaeological Resources  
 4:00 Mark Michel, The Role of the Archaeological Conservancy in Site Protection  
 Discussant: Steven A. LeBlanc
- 5:00 OPEN HOUSE  
 Tiered Balcony  
 Cashiered Bar
- 5:30- AMERICAN SOCIETY FOR CONSERVATION ARCHAEOLOGY  
 7:00 Independence  
 Annual Business Meeting
- 5:30- NATIONAL ASSOCIATION OF STATE ARCHAEOLOGISTS  
 7:00 Cafe Careme  
 Annual Business Meeting
- THURSDAY EVENING, MAY 1**
- 6:00- SOCIETY FOR ARCHAEOLOGICAL SCIENCES  
 8:00 Pennsylvania East  
 Annual SAS Research Lecture: Rainer Berger, "Greater than 40,000 Years of Prehistory on Santa Rosa Island, California. Annual Business Meeting follows the lecture."
- (64) Symposium: YOUR JOB IS ON THE LINE  
 Grand Ballroom  
 Organizer: Coordinating Council of National Archaeological Societies  
 Chairperson: Hester A. Davis  
 Participants:  
 8:00- Carl H. Chapman, Mary Elizabeth King, Ruthanne Knudson, Charles R. McGimsey III,  
 10:00 Charles McKinney, Loretta Neuman, Reynold J. Ruppe, Raymond H. Thompson, Fred Wendorf, Discussion of pending federal regulations, rules and regulations, and other matters of significance

FRIDAY MORNING, MAY 2

- 8:30- SOCIETY FOR HISTORICAL ARCHAEOLOGY  
12:00 Sheraton  
Meeting of the Board of Directors
- (22) Symposium: ARCHAEOLOGY AND THE WIDER PUBLIC  
West Ballroom  
Organizer: Brian M. Fagan  
Chairperson: Charles R. McGimsey III  
Participants:  
8:30 Brian M. Fagan, Popularization of Archaeology  
8:50 Henry Cleere, Archaeology and the Public in Britain  
9:10 William Turnbaugh, Is there Still a Place for the Amateur in Archaeology?  
9:30 Peter Tirrell, Museum School Archaeology Programs  
10:30 Panel Discussion  
Charles R. McGimsey III, Michael Ambrosino, Peter Fowler, George Stuart, David Hurst Thomas
- (23) General Session: MIDWESTERN AND PLAINS UNITED STATES  
East Ballroom  
Chairperson: Mark J. Lynott  
Participants:  
8:00 James L. Phillips and Bruce G. Gjadfelter, Late Archaic Exploitation of the Middle Mississippi River Floodplain: A New Viewpoint  
8:20 Mark J. Lynott, A Preliminary Report of Investigations at the Gooseneck Site, Carter County, Missouri  
8:40 Richard L. Zurel, Woodland and Historic Aboriginal Patterns in Southeastern Michigan  
9:00 Victoria Dirst, The Evolution of Exchange Systems in Wisconsin  
9:20 Mark Lynch, Woodland Settlement Patterns in Southern Illinois  
9:30 Jonathan E. Bowen, Miller's Ridge: A Ft. Meigs Upper Mississippian Village in Northern Ohio  
9:40 Lynne Goldstein, Annotated Aztalan: A Regional Perspective of the Crawfish Valley in Southeastern Wisconsin  
10:00 Douglas K. Charles, Tillman Farley, Steven R. Leigh, and Jane E. Bulkstra, Geomorphology at the Elizabeth Mound Group in West-Central Illinois  
10:10 Kent D. Vickery, The Archaic-Woodland Transition in the Central Ohio Valley: An Example of "Upward Collapse"  
10:30 Andrea L. Novick and Charles E. Cantley, Prehistoric Site Patterning in the Hocking River Valley, Ohio  
10:50 Richard W. Jefferies, The Carrier Mills Archaeological Project: Analysis of Prehistoric Cultural Adaptation During the Middle Archaic in Southern Illinois  
11:00 Chung Ho Lee, Intrasite Variability at a Middle Missouri Village Site: A Case Study  
11:20 Tom Trow, An Archaeological Survey of Minnesota's "Drifting Area"  
11:30 Renata B. Wolyneć, Testing Caldwell's "Primary Forest Efficiency" Concept Using Feature Data from the Koster Site  
11:50 M. B. Collins and Boyce N. Driskell, Changing Valley Geomorphology and Settlement Patterns, 8000 B.C. to A.D. 1900, Falls of the Idaho Area  
12:10 William M. Cremin, The Schwerdt Site: A Fifteenth Century Fishing Station on the Lower Kalamazoo River, Southwest Michigan
- (24) General Session: ARCTIC AND SUBARCTIC  
Cafe Careme  
Chairperson: Richard G. Holloway  
Participants:  
8:00 Wendy Hanford Arundale, A Challenge in Research Design: The Alaska Native Historic Sites Project  
8:20 Sandra K. Blaylock, Thule Bone Technology in the Canadian Arctic  
8:40 Richard G. Holloway, Pollen and Plant Macrofossil Analysis of Site 49SIT119, Southeast Alaska  
9:00 Stanley D. Davis, Hidden Falls: A Multicomponent Site in the Alexander Archipelago of the Northwest Coast

- (25) General Session: METHOD PART II  
Pennsylvania East  
Chairperson: Jon Muller  
Participants:  
8:10 Alan Kosse, Phosphate Analysis in Archaeology: Usefulness of Fractionation Methods  
8:30 Connie Cox Bodner, On the Uses and Abuses of pH in Archaeology  
8:40 N'omi Gerber, Comparisons of Geophysical Remote Sensing Technique for Use in Settlement Pattern Survey  
9:00 Fekri A. Hassan, Anthony F. Drake and Hanl Hamroush, Rapid Field Determination of Phosphate Microquantities and Archaeological Applications
- (26) Symposium: ADVANCES IN STUDYING REGIONAL EXCHANGE SYSTEMS  
Pennsylvania West  
Organizers and Chairpersons: Jonathon E. Ericson and Timothy K. Earle  
Participants:  
8:00 Jonathon E. Ericson, Introduction  
8:05 Timothy K. Earle, Archaeological Approaches to Exchange  
8:25 Shereen A. Lerner, Regional Interaction and Exchange: A Model for Central Arizona  
8:45 Robert L. Bettinger, Prehistoric Territoriality in Owens Valley, Eastern California  
9:05 Frank J. Findlow and Marisa Bolognese, An Initial Examination of Prehistoric Obsidian Exchange in Hidalgo County, New Mexico  
9:25 Ian Hodder, Typology and Exchange Distributions  
9:45 Jonathon E. Ericson, Arthur D. Barite, and Keith R. Ulrich, Analogues in Regional Exchange Studies  
10:20 Sander E. Van der Leeuw, Changes in the Organization of Manufacture and Trade  
10:40 Michael E. Spense, Exchange and the Development of Rank  
11:00 Kathryn D. Hardy, Patricia R. Plante, and Stephen Plog, The Structure of Prehistoric Southwest U.S. Ceramic Exchange: A Black Mesa Case Study  
11:20 Katharine S. Miller, Chemical Characterization of Marine Shell: Initial Experiments  
Discussant: C. C. Lamberg-Karlovsky
- (27) Symposium: NEW PERSPECTIVES ON MOGOLLON PREHISTORY: THE MIMBRES AND RESERVE BRANCHES  
Constitution  
Organizer and Chairperson: Mary Jane Berman  
Participants:  
8:15 James A. Neely, The Branch Concept: A Rose by Any Other Name  
8:35 Roger Anyon and Patricia Gilman, A Re-Evaluation of the Mimbres-Mogollon Archaeological Sequence  
8:55 Michael D. Pool, Settlement Systems and Social Structure During the Early Mogollon Period  
9:15 Paul Minnis, Early Plant Cultivation in the Mogollon Region  
9:35 Richard M. Accola, Inter- and Intra-Community Organization of the Reserve Phase Mogollon of the Middle San Francisco River Region  
9:55 Mary Jane Berman, The Abandonment Process: A Case Study from West-Central New Mexico  
10:35 Laurel K. Grove, The Great Kiva as Redistributive Center  
10:55 David G. Robinson, Ceramic Technology and Later Pinelawn/Reserve Branch Exchange Systems  
11:15 Harry J. Shafer and Anna J. Taylor, Form and Uses of Mimbres Classic Black-on-White at the Nan (Hinton) Ranch Ruin, Grant County, New Mexico  
Discussants: Steven A. LeBlanc, Stewart Peckham
- (28) Symposium: SOUTHEASTERN MESOAMERICAN PERIPHERY: COPAN AND QUIRIGUA  
Independence  
Organizers: Edward Schortman and Patricia A. Urban  
Chairperson: Patricia A. Urban  
Participants:  
8:00 Charles D. Cheek, The Developmental Sequence at the Main Group, Copan  
8:20 C. Jones and R. J. Sharer, Archaeological Investigations in the Site-Core of Quirigua, Guatemala 1975-1979  
8:40 Claude F. Baudez, Iconography and History at Copan

- 9:00 Berthold Riese, Late Classic Relationships between Copan and Quirigua: Some Epigraphic Evidence  
 9:20 Arthur G. Miller, Art Historical Implications of Quirigua Sculpture  
 9:40 Wendy Ashmore, The Classic Maya Settlement at Quirigua  
 10:20 William L. Fash, History and Characteristics of Settlement in the Copan Valley, and Some Comparisons with Quirigua  
 10:40 Edward Schortman, Archaeological Investigations in the Lower Motagua Valley, Guatemala  
 11:00 D. T. Vitek and W. L. Fash, The Copan-Quirigua Connection: Settlement Patterns in the Outlying Reaches of Copan  
 11:20 Richard M. Leventhal, A Reexamination of Stela Caches at Copan: New Dates for Copador  
 Discussants: Gordon R. Willey, Claude F. Baudez, Robert J. Sharer

(29) Symposium: SITE SURVEY IN SOUTHERN NEW ENGLAND: TOWARD A SETTLEMENT MODEL

'76 Room

Organizer and Chairperson: Kenneth L. Feder

Participants:

- 8:00 Kenneth L. Feder, Introductory Remarks  
 8:15 Kevin McBride, Subsistence and Settlement in the Lower Connecticut River Valley—Alternative Hypotheses  
 8:30 William M. Wadleigh, Prehistoric Settlement and Subsistence in the Northeastern Highlands of Connecticut  
 8:45 Kenneth L. Feder, The Farmington River Archaeological Project: Focus on a Small River Valley  
 9:00 Francis P. McManamon, Archaeological Survey of Cape Cod National Seashore, Massachusetts  
 9:10 Paul Robinson, A Deductive Approach to Modeling Site Locational Behavior  
 9:30 David Poirier, Southern New England Archaeological Surveys: A Preservation Planning Perspective  
 Discussant: Francis P. McManamon

(30) General Session: OLD WORLD

Cafe Careme

Chairperson: Joseph L. Chartkoff

Participants:

- 9:30 Donald O. Henry, Paleolithic Investigation in Southern Jordan  
 9:50 Joseph Schuldenrein, Late Quaternary Paleoenvironments and Prehistoric Site Distributions in the Lower Jordan Valley  
 10:10 Joseph L. Chartkoff, The Petriolo II Project  
 10:30 Mary M. A. McDonald, A Regional Investigation of Neolithic Diffusion Rates  
 10:50 Shan M. Winn and Daniel Shimabuku, Responses to Deteriorating Agricultural Conditions at Brotta Scaloria, Southeastern Italy, During the Neolithic  
 11:00 Krisztina Kosse, Settlement Ecology of the Körös and Linear Pottery Cultures in Hungary  
 11:20 Janet B. Levy, Investigating Prehistoric Religion: A Bronze Age Example  
 11:40 Antonio Gilman, The Origins of Social Stratification in Later Prehistoric Europe  
 12:00 Kathryn Maurer Trinkaus, The Partho-Sassanian Frontier: Settlement in Northeast Iran

(31) Symposium: THE DOLORES ARCHAEOLOGICAL PROGRAM, SOUTHWEST COLORADO

Pennsylvania East

Organizers: William D. Lipe and David A. Breternitz

Chairperson: Bruce Rippeteau

Participants:

- 10:00 Bruce Rippeteau, Introduction  
 10:15 Lou Madden and Ward F. Weakly, The Dolores Project in Historical Perspective  
 10:30 David A. Breternitz, R. A. Bye, S. E. James, A. E. Kane, and R. Knudson, Research Design and Operations Management  
 10:45 Allen E. Kane, Dolores Archaeological Program: Cultural Systematics and Intersite Patterning  
 11:00 Rob Huggins and John Weymouth, The Role of Magnetic Prospection on Sites of the Dolores Program

- 11:15 Tim Kohler and Sarah Schlienger, Surficial Estimation of Intrasite Patterning  
 11:30 William Lipe and Cory Breternitz, Activities and Architecture: Analysis of Variability in Dolores Area Structures  
 Discussant: Jeffrey Dean

(32) Symposium: CUELLO 1980: PRELIMINARY PAPERS

'76 Room

Organizer and Chairperson: Norman Hammond

Participants:

- 10:00 Norman Hammond, Cuello Excavations 1980: An Overview  
 10:20 Juliette Cartwright, Early Formative Buildings at Cuello  
 10:40 Charles Miksicek, Corn and Other Crops in the Early Formative at Cuello  
 11:00 Laura Kosakowsky, Ceramic Analysis at Cuello, 1980  
 11:20 Michael Davenport and Carl Beetz, Structure 35 and Other Late Formative Buildings at Cuello  
 Discussant: Richard E. W. Adams

FRIDAY AFTERNOON, MAY 2

12:00– COORDINATING COUNCIL OF NATIONAL ARCHEOLOGICAL SOCIETIES

3:00 Sheraton

Meeting of the Board of Directors

(33) General Session: EASTERN UNITED STATES

West Ballroom

Chairperson: Jerald T. Milanich

Participants:

- 1:00 James Bradley, Thomas E. Mahlstedt, and Francis P. McManamon, A Native American Ossuary on Cape Cod, Massachusetts  
 1:20 Neal H. Lopinot, Paleoethnobotanical Analyses of Column Samples from an Archaic Woodland Midden  
 1:30 Charles Fisher, Triangular Point Form and Site Age During the Woodland Period in Eastern New York State  
 1:40 Pierre Morenon, David J. Bernstein, and Gerlach Craig, Coastal Archaeology in Southern New England: An Experimental Assessment of Some Methodological Alternatives for the Study of Shellmiddens  
 2:00 Robert F. Maslowski, The Childer's Site (46 MS 121): A Late Woodland Hamlet in Mason County, West Virginia  
 2:10 Jay F. Custer, A Comparison of Blue Ridge and Great Valley Settlement/Subsistence Systems  
 2:30 John F. Scarry, The Emergence and Expansion of Fort Walton Cultures: A Preliminary Model  
 2:50 Jerald T. Milanich, Conclusions from the McKeithen Site, An Early Weeden Island Mound-Village Complex in Northern Florida  
 3:10 Leland G. Ferguson and Stanton W. Green, South Appalachian Mississippian: Politics and Environment in the Old, Old South  
 3:30 Karl T. Steinen, Land Use and Site Distribution in the Prehistoric Georgia Piedmont  
 3:40 J. M. Adovasio and W. C. Johnson, The Appearance of Cultigens in the Upper Ohio Valley: A View from Meadowcroft Rockshelter  
 4:00 Robert W. Neuman, The Persimmon: Its Documentation in the Archaeology of Eastern United States  
 4:10 Bruce D. Dickson, The Yanomamo of the Mississippi Valley? Some Reflections on Larson (1972), Gibson (1974) and Mississippian Period Warfare in the Southeastern United States

(34) General Session: MESOAMERICA: PART I

East Ballroom

Chairperson: Barbara Voorhies

Participants:

- 1:00 John K. Mallory, Modeling the Place of Protein in a Pre-Columbian Subsistence System



- 1:20 Rene R. Gadacz, Site Structure Morphology of Mesoamerican Ceremonial and Urban Centers  
 1:40 Richard M. Rose, Descending Gods and the Mesoamerican Ball Game  
 2:00 Evelyn Ratray, The Identification of Trade Ceramics at Teotihuacan  
 2:10 Ann Cyphers Guillen, Ceramics and Cultural Development in the Valley of Xochicalco, Morelos, Mexico  
 2:30 Dennis E. Lewarch, Preliminary Definition of Late Post-classic Community Pattern in the Coatlan Del Rio Valley, Western Morelos  
 2:50 Donovan C. Senter, The Production of Pottery at Cuentepec, Morelos  
 3:00 Gene J. Paull and Anthony N. Zavaleta, The Northeastern Boundary of Mesoamerica: New Information  
 3:10 Gary S. Webster, Optimal Hunting in the Tehuacán Valley: A Non-Equilibrium Approach to the Study of Economic Change  
 3:30 Barbara Voorhies, Research Report on the Soconusco Prehistory Project

(35) General Session: METHOD AND THEORY: PART II

- Cafe Careme  
 Chairperson: David Hally  
 Participants:  
 1:00 Gawain Hammond and Norman Hammond, Child's Play: A Distorting Factor in Archaeological Distributions  
 1:10 Richard S. Levy and Eric C. Gibson, Linguistic Evidence for the Prehistory of the Pacific Northwest  
 1:30 Charlotte L. Benson, Applications of Seriation in Community Pattern Analysis  
 1:50 Phillip L. de Barros, The Effects of Site Duration Variability Upon the Results of Frequency Seriation  
 2:10 David M. Helgren, Locating Hunter-Gatherer Archaeological Sites: A Spatial and Paleoenvironmental Paradigm  
 2:30 Ira C. Beckerman, The Use of Optimal Foraging Theory in Developing Predictive Settlement Models  
 2:50 Jeanette E. Stephens, The Intra-Site Spatial Structure of Multicomponent Archaeological Sites  
 3:00 Marion F. Smith, Jr., Archaeological Ceramics as Vessels: Relating Morphology to Utilitarian Function  
 3:20 David J. Hally, The Interpretive Potential of Pottery from Domestic Contexts  
 3:40 Arthur J. Jellinek, The Concept of Contemporaneity in Archaeology  
 4:00 Lynda E. Spickard, Strategies for Sustained Yield of Fish Resources  
 4:20 Dolores Root, Tracking the Archaeological Record: Archaic Site Distributions on Massachusetts' Coast  
 4:40 Mary Ann Niemczycki, Matrilocality and Iroquois Archaeology: Myth and Reality

(36) Symposium: LOCATIONAL MODELS: IMPLICATIONS AND ALTERNATIVES

- Pennsylvania East  
 Organizer and Chairperson: Richard W. Effland  
 Participants:  
 1:30 L. J. Zimmerman, S. Archer, and L. L. Tieszen, Ecological Characterization as a Foundation for Prediction of Plains Village Tradition Site Locations in Central South Dakota  
 1:50 Richard W. Effland Jr., A Study of Prehistoric Spatial Behavior: Long House Valley, Northeastern Arizona  
 2:10 Bruce D. Smith, The Spatial Distribution of Late Prehistoric Horticulturalists in the Eastern United States  
 2:30 Vincas P. Steponaitis, Settlement Hierarchies in Non-Marker Contexts: The Formative Period Valley of Mexico  
 2:50 Margarie Green and Richard Effland, A Regional Perspective for the Study of Spatial Relationships  
 3:30 Steadman Upham, Jeffrey Hantman, Kent G. Lightfoot and Jill Neitzel, Spatial Organization of the Classic Hohokam  
 3:50 Robert Layhe, The Distribution of Prehistoric Population: A Locational Analysis  
 4:05 Anthony L. Klesert and Bonnie Kranzer, A Modified Linear Nearest Neighbor Technique  
 4:20 Duncan C. Wilkie, Diachronic Changes in Settlement Patterns: Nearest Neighbor Analysis  
 Discussants: Fred Plog, Ian Hodder

(37) General Session: LITHICS

- Pennsylvania West  
 Chairperson: George C. Frison  
 Participants:  
 1:00 Carol L. Yamate, Mathematical Models in Archaeology: A Critical Look at Speth's Mechanical Basis of Percussion Tools  
 1:20 Joan M. Gero, Stylistic Information in Common Flake Tools  
 1:30 David J. Meitzer, Style and Function in a Class of Tool  
 1:50 Stephen H. Graff, Functional Aspects of Ground Stone Tool Technology  
 2:00 George C. Frison, Fluting of Folsom Projectile Points: New Archaeological Evidence  
 2:20 Rachel Most, An Examination of Technological Variability and Production as Reflected in Lithic Debitage: An Example from Pinedale, East-Central Arizona  
 2:30 Steven K. Lovick, Intrasite Variability through Lithic Analysis  
 2:50 Johna Hutira and Jon Joha, Wasted Days and Wasted Nights? The Feasibility and Utility of Microwear Analysis  
 3:00 Rochelle J. Goodsitt, Designing a Simple Recording Scheme for Large Lithic Assemblages: An Example from the Koster Site  
 3:20 Carol A. Rasper, A Production Stage Analysis of Lithic Artifacts from the Lightline Lake Site, Leflore County, Mississippi  
 3:30 Terry A. Del Bene and Gerald A. Holley, Theoretical Considerations of Use-Wear Analysis

(38) Symposium: SOILS AND PATTERNS OF PAST HUMAN BEHAVIOR

- Constitution  
 Organizers: Jonathon E. Ericson and Alf Sjöberg  
 Chairperson: Jonathon E. Ericson  
 Participants:  
 1:30 Jonathon E. Ericson, Introduction  
 1:35 Myra L. Shackley, Canford Heath Barrow: Construction and Paleoenvironment from a Truncated Palaeosol  
 1:50 Robert W. Kessler, Soil Analysis in North American Historical Archaeology  
 2:05 Elizabeth A. Coughlin and Jonathon E. Ericson, Biogeochemical Residues as Ethnobotanical Indicators  
 2:20 Miguel Bombin, Phytoliths and Past Human Activity  
 2:35 Alf Sjöberg, Implications of Spatial Differences in Soil Chemical Elements Within an Archaeological Site  
 2:50 Christopher Carr, The Chemistry of Archaeological Soils from an Ecosystemic, Temporal Perspective  
 3:25 Donald A. Davidson, Soils and Archaeological Site Distributions  
 3:40 Morgan J. Tamplin and Rodger Jones, Geochemical Studies of Iron Age Sites in southern Africa  
 3:55 Julie Stein, The Earthworm: An Unsuspected Nemesis for Archaeologists  
 4:10 C. S. Holzhey, Raymond B. Daniels, and J. N. Gundersen, Soil Survey Data Available in the United States  
 Discussants: Neil R. Camping and Jonathon E. Ericson

(39) Symposium: SOUTHEASTERN MESOAMERICAN PERIPHERY: WESTERN HONDURAS AND EL SALVADOR

- Independence  
 Organizers: P. A. Urban and E. M. Schortman  
 Chairperson: E. M. Schortman  
 Participants:  
 1:00 G. R. Willey, R. J. Sharer, R. Viel, A. Demarest, R. Leventhal, and E. Schortman, A Study of Ceramic Interaction in the Southeastern Maya Periphery  
 1:20 M. P. Beaudry, R. L. Bishop, R. M. Leventhal, and R. J. Sharer, Typological and Compositional Analysis of Classic Painted Ceramics in the Southeastern Maya Area  
 1:40 Nedenia C. Kennedy, Opening the Frontier at Playa de los Muertos  
 2:00 Arthur A. Demarest, The Dating and Cultural Associations of the "Pot-Bellied" Sculptural Style  
 2:20 Payson D. Sheets, Regional Economic Relationships in the Zapotitan Valley, El Salvador, as Indicated by Obsidian Analyses  
 2:40 Patricia A. Urban, Precolumbian Settlement in the Naco Valley, Northwestern Honduras

- 3:20 Eugenia J. Robinson, Site Hierarchies in the Prehistoric Settlement in the Sula Valley, Honduras  
 3:40 James J. Sheehy, Implications of Fine Paste Ceramics at Travesia  
 4:00 Anthony Wonderley, Postclassic Naco, Honduras  
 4:20 Ricardo A. Agurcia F., Late Classic Settlements in the Comayagua Valley  
 Discussants: Gordon R. Willey, Claude F. Baudez, Robert J. Sharer

(40) Symposium: THE FORT ANCIENT TRADITION: NEW PERSPECTIVES ON THE LATE PRE-HISTORY OF THE MIDDLE OHIO VALLEY

- '76 Room  
 Organizer and Chairperson: Patricia S. Essenpreis  
 Participants:  
 1:00 Rodney E. Riggs, Fort Ancient Settlement in South Central Ohio  
 1:15 James M. Heilman and Roger Hoffer, Astronomical Alignments at the Incinerator Site: A Fort Ancient Village in Dayton, Ohio  
 1:30 Gall E. Wagner and Orrin Shane, Fort Ancient Subsistence in Southwestern Ohio  
 1:45 James Robertson, Analysis of Lithic Distribution at the Incinerator Site, Dayton, Ohio  
 2:00 Patricia S. Essenpreis, Community Patterning at the Anderson Village Site in Southwestern Ohio  
 2:15 David S. Brose, Special Purpose Fort Ancient Sites in Southern Ohio  
 2:30 Jeff Carskadden, Middle Fort Ancient Settlement Patterns and Cultural Relationships in the Muskingum Valley of Eastern Ohio  
 3:15 William C. Johnson and J. M. Adovasio, Fort Ancient on the Frontier: A View from Bluestone Lake, West Virginia  
 3:30 Jeffrey R. Graybill, The Eastern Periphery of Fort Ancient: Origins and Development  
 3:45 Louise M. Robbins, Biocultural Heterogeneity among the Protohistoric Fort Ancient People  
 Discussion: Round table discussion

4:00 SOUTHEASTERN ARCHAEOLOGICAL CONFERENCE

Sheraton  
 Meeting of the Executive Board

5:30 SOCIETY FOR AMERICAN ARCHAEOLOGY ANNUAL BUSINESS MEETING

Grand Ballroom  
 Fred Wendorf, President

Address by M Rupert Cutler, Assistant Secretary for Natural Resources and Environment, Department of Agriculture. Mr. Cutler will speak about the department's cultural resource management policy and programs.

FRIDAY EVENING, MAY 2

8:00- RECEPTION FOR NEW MEMBERS

9:00 Constitution  
 Reception hosted by present and past Society officers for new members and members attending their first annual meeting

8:00- SOCIETY OF PROFESSIONAL ARCHEOLOGISTS

10:00 Pennsylvania West  
 Annual Business Meeting

8:00- AMERICAN COMMITTEE TO ADVANCE THE STUDY OF PETROGLYPHS AND PICTOGRAPHS

10:00 '76 Room  
 Informal discussion

SATURDAY MORNING, MAY 3

9:00 SOCIETY FOR AMERICAN ARCHAEOLOGY

Sheraton  
 Meeting of the Executive Committee

(41) Symposium: THE SIMPLE AND COMPLEX SOCIETIES OF WEST AND NORTHWEST MEXICO PART I

- West Ballroom  
 Organizers and Chairperson: Michael S. Foster, Phil C. Weigand, and Thomas Hollen  
 Participants:  
 8:30 Morrison L. Boyce, An Archaeological Survey of the Valley of Temascalcingo, Mexico, Queretaro and Michoacan, Mexico  
 8:50 Helen P. Pollard, Economic Implications of Population and Resources in the Core Tarascan State  
 9:10 Shirley Gorenstein, Reconstructing Early Hispanic Settlement in the Lake Patzcuaro Basin  
 9:30 Joseph B. Mountjoy and Luis Torres, The Production and Use of Prehistoric Metal Artifacts in the Central Coastal Area of Jalisco, Mexico  
 9:50 Phil C. Weigand, The Extent of the Teuchitlan Tradition  
 10:30 Stuart D. Scott, Core versus Marginal Mesoamerica: A Coastal West Mexican Perspective  
 10:50 George W. Gill, Cultural Implications of Artificially Modified Human Remains from Northwest Mexico  
 11:10 Marie-Areti Hers, Mision Arqueologica Belga en la Sierra del Nayar: Zona Noreste de Huejuquill El Alto Jalisco  
 11:30 Carolyn Baus de Czitrom, Ethnohistory and Archaeology of the Tecuexe and Cocas of Jalisco: An Attempt at Correlation  
 11:50 Robert D. Shadow, Evolution of Land Use and Land Tenure in the Municipio of Villa Guerrero, Jalisco, Mexico  
 Discussants: Joseph B. Mountjoy, Phil C. Weigand, J. Charles Kelley, Ellen A. Kelley, Carroll L. Riley, Charles C. DiPeso

(42) Symposium: COMING OF AGE IN ARKANSAS: THIRTEEN YEARS OF THE ARKANSAS ARCHAEOLOGICAL SURVEY

- East Ballroom  
 Organizers and Chairpersons: Neal L. Trubowitz and Marvin D. Jeter  
 Participants:  
 8:00 Neal L. Trubowitz, Site Files and Publications: Reflections of Research  
 8:15 Dan F. Morse, Regional Overview of Northeast Arkansas  
 8:30 Phyllis A. Morse, The Parkin Site and Phase  
 8:45 Timothy Klinger, Assessing the Arkansas Contract Archaeology Program: Its Trials and Tribulations; Its Accomplishments and Prospects  
 9:00 Daniel Wolfman, Archaeomagnetic Dating in Arkansas and the Border Areas of Adjacent States  
 9:15 Ann M. Early, Caddoan Settlement Systems in the Ouachita River Valley  
 9:30 Marvin D. Jeter, The Archaeology of Southeast Arkansas: An Overview for the 1980's  
 9:45 Leslie C. Abernathy, The Other Four and a Half Centuries: Historical Archaeology in Arkansas  
 10:00 Russel G. Scheibel and Ann M. Early, The Productive Partnership: Amateur and Professional in Arkansas Archaeology  
 10:15 L. Mark Raab, Expanding Prehistory in the Arkansas Ozarks  
 10:30 Gayle J. Fritz and Robert Ray, Rock Art Sites in the Southern Arkansas Ozarks  
 10:45 John H. House, Evolution of Complex Society in East-Central Arkansas: An Overview of Environments and Regional Data Bases  
 11:00 Martha A. Rolingson, Public Archaeology: Research and Development of the Toltec Site  
 11:15 Michael P. Hoffman, The Arkansas Archaeological Survey 1967-1980, an Emic-Etic Perspective  
 Discussants: J. B. Griffin, Clarence H. Webb, Stephen Williams, Thomas F. King, Michael B. Schiffer, Charles R. McGimsey III

(43) Symposium: FROM FLINT RIDGE TO VERA CRUZ: LITHIC RESOURCES IN THE NORTH-EAST

Cafe Careme

Organizers and Chairpersons: Barbara Luedtke and R. Michael Gramly

Participants:

- 8:00 Richard M. Gramly, Excavations at the Mount Jasper Lithic Source Area  
8:20 Marshall Becker, Steatite Resources in the Northeastern United States: Distribution and Potential for Identification  
8:40 Robson Bonnicksen, The Munsungun Lake Lithic Source Region  
9:00 C. A. Ebricht, Prehistoric Quartzite Utilization in Southeastern Pennsylvania  
9:20 Lucianne Lavin, Microscopic Analysis of Crypto-crystalline Silica materials Within and Adjacent to the Delaware River Valley Watershed  
9:40 Shirley S. Albright and Lorraine Williams, Differentiation of fine-grained Sedimentary and Metamorphic Rocks Utilized by Prehistoric Populations of the Mid-Atlantic Region  
10:20 Barbara Luedtke, Neutron Activation Analysis of Massachusetts Volcanics  
10:40 Christopher Nagle, William Fitzhugh, Ralph Allen, and Marianne Storey, NAA Characterization of Soapstone Sources, and Dorset Archaeology in Labrador  
11:00 George P. Nicholas, Crystal Quartz as a Pre-Alithermal Lithic Resource in Northern New England  
11:20 William A. and Sarah P. Turnbaugh, Characterization of Southern New England Soapstones

(44) Symposium: ENERGY AND ARCHAEOLOGY: RESPONSE TO A NATIONAL PRIORITY

Pennsylvania East

Organizer: Judy L. Brunson

Chairperson: Bennie C. Keel

Participants:

- 8:00 Charles M. McKinney, Archaeology, the Law, and America's Energy Imperative: Mandated Compatability  
8:15 Janet Friedman, Cultural Resource Management and Planning in the Forest Service  
8:30 Sarah T. Bridges, Historical and Archaeological Resource Management in the Fish and Wildlife Service  
8:45 Herrick E. Hanks and Linda Goff, Energy and Archaeology—Boom or Bust?: A BLM Perspective  
9:00 J. Ned Woodall and Jane G. Evans, Another Crisis in North American Archaeology  
9:15 Mark R. Barnes, The Historic Preservation Fund  
9:30 Edward B. Jelks, Discussion of Foregoing Papers  
10:00 Ronald D. Anzalone, The Archaeologist as "Environmentalist": Using and Abusing NEPA  
10:15 Bruce A. Eberle, Historic and Archaeological Preservation in the Federal Aid Highway Program  
10:30 Ward Weakly, The Water and Power Resources Service and Archaeology in the 1980's  
10:45 Judy L. Brunson, Energizing Archaeology  
11:00 Bruce Rippeteau, Colorado and Energy Development: A State Case-Study of Rights  
11:15 Marley R. Brown III, David Fredrickson, and Daniel Larson, Cultural Resources and Geothermal Development at the Geysers, California  
11:30 William B. Butler and Charles M. Niquette, In Consideration of Archaeologists Serving Industry, Cultural Resources and the Profession  
11:45 Don D. Fowler, Discussion of Foregoing Papers

(45) Symposium: AMERICAN INDIANS AND ARCHAEOLOGY TODAY

Pennsylvania West

Organizer and Chairperson: Joyce Herold

Participants:

- 8:00 Edward E. Claplanhoo, The Makah Walking Through the Past  
8:20 Larry D. Halkey and Buford Rolin, Nativist Archaeology by Poarch Band of Creeks in Alabama  
8:40 George H. J. Abrams, American Indian Religion, Law and Museums  
9:00 Joe E. Watkins, The Role of Native Americans in the Development of the Interagency Archaeological Services "Policy for the Disposition of Human Remains"  
9:20 George C. Knight, Blackfeet and Bureaucrats: Complying with the American Indian Religious Freedom Act  
9:40 Thomas H. Loy, Indian and Archaeologist Relations and Policy in British Columbia

(46) Symposium: CONTEMPORARY ANDEAN CULTURAL CONTINUITY THROUGH ARCHAEOLOGICAL INQUIRY

Constitution

Organizers and Chairpersons: James M. Vreeland Jr. and Tom D. Dillehay

Participants:

- 8:00 Dean E. Arnold, Ceramic Stylistic Correlates of a Community of Potters in Quinua, Peru  
8:20 James M. Vreeland Jr., Cotton Crafts and Cults: A North Coast Survival  
8:40 Gary Urton, Ethnographic and Ethnohistoric Analogies for Astronomical Iconography in Pre-Columbian Peru  
9:00 Tom D. Dillehay, Formative Period Aspects of Mapuche Society  
9:20 James L. Nolan, How Green Was My Valley: Culture History and Irrigation on the North Coast of Peru  
Discussant: Richard P. Schaedel

(47) Symposium: EXCAVATION AT THE SHAWNEE-MINISINK SITE: REPORTS ON 11,000 YEARS OF CULTURAL AND ENVIRONMENTAL HISTORY IN EASTERN NORTH AMERICA

Independence

Organizers and Chairpersons: June Evans and Richard J. Dent

Participants:

- 8:00 Charles W. McNett Jr., Methodology and Chronology at the Shawnee-Minisink Site  
8:20 Richard J. Dent, Amerind Society and Paleoeological Reconstruction in the Upper Delaware Valley  
8:40 Sydne B. Marshall, Descriptive Artifact Categories and Implied Function: A Problem in Archaeological Semantics  
9:00 June Evans, Paleo-Indian to Early Archaic Transition at the Shawnee-Minisink Site  
9:20 Barbara McMillan, The Isolation of Living Floors from Compact Stratigraphy  
Discussant: Russell Handsman

(48) Symposium: CURRENT RESEARCH AT THE ABBOTT FARM NATIONAL HISTORICAL LANDMARK

'76 Room

Organizer and Chairperson: Janet S. Pollak

Participants:

- 8:15 Marie S. Clabeaux, Human Skeletal Remains from the Abbott Farm Site  
8:35 David C. Parris, Faunal Evidence of Seasonal Occupation of the Abbott Farm Locality  
8:55 Lorraine E. Williams and Shirley S. Albright, Lithic Utilization in the Middle Woodland Occupation of the Abbott Farm Site  
9:15 Janet S. Pollak, Preliminary Middle Woodland Settlement Model for the Abbott Farm Site  
Discussant: James B. Griffin

(49) Symposium: URBAN ARCHAEOLOGY IN PHILADELPHIA

Pennsylvania West

Organizers and Chairpersons: Alex H. Townsend and Daniel G. Roberts

Participants:

- 10:00 Alex H. Townsend and Daniel G. Roberts, Problems in Archaeological Modeling and Sampling in Philadelphia  
10:15 Michael Parrington, Salvage Archaeology at Area F, Independence National Historic Park, PA  
10:30 Kenneth J. Basalik, Urban Patterning in Philadelphia  
10:45 Betty J. Cosans, Cultural Interpretation of Privy Fills in Three 19th Century Philadelphia Neighborhoods  
11:00 Barbara Liggett, Documents as Artifacts in 17th and 18th Century Philadelphia  
11:15 Richard Tyler, Urban Archaeology and Historic Preservation in Philadelphia  
Discussant: John L. Cotter

(50) Symposium: SOCIAL, POLITICAL, AND ECONOMIC ORGANIZATION IN THE COASTAL ENVIRONMENT

Constitution

Organizers and Chairpersons: Albert G. Bixler and Jeanne E. Arnold

Participants:

- 10:00 Jeanne E. Arnold, Theoretical Considerations for Coastal Adaptations

- 10:15 Robert G. Whitlam, Towards a Comparative Understanding of Settlement-Subsistence Strategies in Coastal Environments: Preliminary Systematics and Application  
 10:30 Albert G. Bixler, Social Evolution and Environmental Change: A Case Study from Coastal California  
 10:45 Randolph J. Widmer, Socio-political Implications of a Tropical Sedentary Estuarine Adaptation: A Southwest Florida Example  
 11:00 Stephen M. Perlman, Relative Stability of Coastal and Interior Adaptations  
 11:15 Alan Osborn, Coastal Population Densities and Marine Resources: Resolution of an Anthropological Paradox  
 Discussant: Michael Jochim

(51) Symposium: SITE LOCATIONAL STRATEGIES IN HEAVILY VEGETATED AREAS

- Independence  
 Organizer and Chairperson: John E. Keller  
 Participants:  
 10:00 John E. Keller, Survey and Settlement in the Central Louisiana Pine Uplands  
 10:15 A. Wayne Prokopetz, Reconstruction of Settlement Patterns in Densely Vegetated Areas  
 10:30 Prentice M. Thomas, Testing Shallow Sites in Forested Areas  
 10:45 Paul D. Rubenstein, The Apple Orchard Survey: A View of Upland Settlement in Southwest Virginia  
 11:00 Michael B. Barber, Settlement Pattern Variation Due to Distinctive Geomorphological Feature: The Coeburn Exchange Inventory, Wise County, Virginia  
 11:15 Steven Shelley, Archaeological Survey in Kisatchie National Forest: An Integrated Survey Method for Heavily Vegetated Areas and Cultural Resource Management  
 11:25 John Ippolito, Predictive Modeling and Forest Survey in the National Forests of Texas  
 Discussants: Kent A. Schneider, Harry J. Shafer, Lorraine Heartfield

(52) Symposium: COROZAL POSTCLASSIC PROJECT-INTERIM REPORT

- '76 Room  
 Organizers and Chairpersons: Diane Z. Chase and Arlen F. Chase  
 Participants:  
 10:00 Diane Z. Chase, The Corozal Postclassic Project- An Overview  
 10:15 Arlen F. Chase, Intrusive Elements in the Archaeology of Nohmul and Santa Rita  
 10:30 Robert Coffman and Arlen F. Chase, The Search for Holpatin: Historic Excavations in Orange Walk  
 10:45 Stuart Fleming and Nicholas Hartmann, Scientific Dating Techniques: Their Potential in the Corozal Postclassic Project  
 11:00 Nicholas Hartmann and Diane Z. Chase, Microscopic Analysis of Obsidian from Santa Rita  
 Discussant: Arthur Miller

**SATURDAY AFTERNOON, MAY 3**

(53) Symposium: THE SIMPLE AND COMPLEX SOCIETIES OF WEST AND NORTHWEST MEXICO PART II

- West Ballroom  
 Organizers and Chairpersons: Michael S. Foster and Phil C. Weigand  
 Participants:  
 1:30 Thomas Hollen, Cloisonne Style Variability and Associations in Western Mesoamerica  
 1:50 Charles D. Trombold, The Present Status of Archaeology at La Quemada: Past, Present, and Future Research  
 2:10 Robert B. Pickering, Mortuary Behavior in the Alta Vista Phase of Chalchihuites Culture  
 2:30 J. Charles and Ellen A. Kelley, The Ceremonial Center Concept in Chalchihuites Culture, Zacatecas, Mexico  
 2:50 Michael S. Foster, Loma San Gabriel-Chalchihuites: Culture Contact and Acculturation on the Northwest Periphery of Mesoamerica  
 3:30 Carroll L. Riley, Spanish Contact and the Collapse of the Sonoran Statelets  
 3:50 R. A. Pailles and Daniel T. Reff, Colonial Exchange Systems and the Decline of Paquime

- 4:10 Charles Di Peso, Displaced Native Americans as Described in the Fuentes/Theran Diaries of the Wars of the Nations of the Janos, Jacomes, Mansos, Sumas, Chinaras, and the Apaches, 1695  
 4:30 Thomas Bowen, In Search of the San Esteban Island Seri  
 4:50 Richard H. and Shellagh T. Brooks, A Game People Played: The Distribution of Jugar a Cuatro in Northwest Mexico

(54) General Session: SOUTHWEST UNITED STATES

- East Ballroom  
 Chairperson: Robert Euler  
 Participants:  
 1:00 John Ravesloot and Debra L. Martin, Mortuary and Paleonutritional Analyses of Burials from Black Mesa, Arizona: Implications for Social and Economic Organization  
 1:10 Mark A. Catlin, The Primary-Secondary Site Aggregate as an Environmental and Social Adaptive Mechanism on Black Mesa, Arizona: Its Statistical and Substantive Significance  
 1:30 Stephen R. Whitecotton, Basketmaker II Sites on Black Mesa, Arizona  
 1:50 David G. Eckles, Abandonment of Northeastern Black Mesa, Arizona  
 2:10 Hayward H. Franklin, Stylistic Relationships Between Mesa Verde B/W and the White Mountain Redwares  
 2:30 Suzanne P. De Atley, Measuring Standardization in Ceramic Production in the Prehistoric Southwest  
 2:40 Patricia L. Crown, Understanding Variability in the Utility Wares in the Upper Little Colorado Region  
 2:50 Robert C. Euler, New Evidence of the Pinto Basin Complex at Grand Canyon, Arizona  
 3:10 William A. Dodge, Archaeological Investigations at Cochiti and Jemez Pueblos, New Mexico  
 3:20 Kevin Rafferty, Mining and Craft Specialization in the Middle Gila Valley, Arizona  
 3:30 Janet D. Orcutt, Responses to Food Stress on the Pajarito Plateau: An Analysis of Pueblo Site Locations  
 3:50 Joanne T. Daddario, An Exchange and Interaction Network on the Colorado Plateau  
 4:00 David L. Lentz, The Archaeological Interpretation of Juniper Cones and Seeds Found in Salmon Ruin, New Mexico  
 4:10 Alan H. Simmons and Gary O. Rollefson, Early Athabascan Occupation in Northwestern New Mexico: New Archaeological Evidence  
 4:20 Jeffrey D. Goodman, A Paleo-Indian Ingraved Stone From Flagstaff, Arizona  
 4:30 Barbara J. Mills and T. J. Ferguson, Processes of Architectural Change: Examples from the Historic Zuni Farming Villages  
 4:50 Laurie Blank-Roper, Functional Relationships of Large and Small Sites in the Middle Gila, Arizona  
 5:20 Laura L. LePere, Inter-Regional Exchange of Lithic Materials at Chavez Pass

(55) General Session: ZOOARCHAEOLOGY

- Cafe Caramé  
 Chairperson: Brian Hesse  
 Participants:  
 1:00 Allen P. McCartney, Anthropological Implications of Bowhead Whale Bone Use in the Canadian Arctic  
 1:20 Shirley Powell and Michele Seme, A Reevaluation of Interpretations of Faunal Inventories on Small Archaeological Sites  
 1:30 Brian Hesse, Young Kill as Evidence for Domestication: A Reconsideration of the Criticism  
 1:50 Frank E. Bayham, The Effect of Sedentism on Animal Procurement at Ventana Cave  
 2:10 Joe Brown and David T. Clark, A Preliminary Report on the Faunal Assemblage from Russell Cave: 1956-1958 Excavations  
 2:20 Pam Jean Crabtree, Animal Use and Cultural Change

(56) General Session: MESOAMERICA: PART II

- Pennsylvania East  
 Chairperson: Robert Fry  
 Participants:  
 1:00 Emily McClung de Tapia, Prehispanic Cultural Ecology in the Valley of Toluca

- 1:10 Paul F. Healy and Heather McKillop, *Moho Cay, Belize: Ancient Mayan Maritime Adaptations*
- 1:20 Nancy L. Hamblin, *The Role of Marine Resources in the Mayan Economy: A Case Study from Cozumel, Mexico*
- 1:30 Anabel Ford, *Classic Maya Settlement Patterns and Problems of Economic and Political Complexity*
- 1:50 Ronald L. Bishop, Garman Harbottle, Edward V. Sayre, and Lambertus Van Zelst, *Lowland Maya Ceramic Survey*
- 2:10 Jeanne S. Sweeney, *Development of the Ball Court Complex, Copan, Honduras*
- 2:30 Don S. Rice, Prudence M. Rice, David G. Batcho, and Leah Minc, *Muralla de Leon: Preliminary Report on an Aboriginal Fortification in Central Peten, Guatemala*
- 2:50 Jeff Karl Kowalski, *A Historical Interpretation of the Inscriptions of Uxmal*
- 3:10 Mary E. D. Pohl, *The Terminal Classic Period Economy at Tikal*
- 3:30 Lawrence H. Feldman, *Tribute at Mid Century, Sixteenth Century Guatemalan Tax Records*
- 3:40 Keith Lynch and Sarah Gehlert, *Demographic Analysis and Archaeological Studies of Extinct Communities in Coastal Guatemala*
- 4:00 David J. Bernstein, *The Central American Celt: Considerations of Functional Diversity*
- (57) **Symposium: THE IVORY TOWER IN THE COMMUNITY: SCHOLARSHIP AND THE PUBLIC IN ALEXANDRIA, VIRGINIA**  
 Pennsylvania West  
 Organizer and Chairperson: Pamela J. Cressey  
 Participants:  
 1:30 Pamela J. Cressey, *Sharing the Ivory Tower*  
 1:50 Susan L. Henry, *An Integrative Survey Strategy for Research and Preservation*  
 2:10 D. Katherine Beldleman, T. E. Davidson, R. P. Napoli, R. Wheeler, and M. Weiss, *Creating A Data Base: The City's Test Square*  
 2:30 Steven J. Shephard, *An Archaeological Model: Change in the Nineteenth Century Urban Middle Class*  
 2:50 Laura A. Henley, Ann Palkovich, and Jonathan Haas, *The Other Side of Alexandria: Archaeology in an Enduring Black Neighborhood*  
 3:30 Terry H. Klein, *Management of the Past: Balancing Scientific and Community Needs*  
 3:50 John F. Stephens and Steven J. Shephard, *The Volunteer Program: Developing a Symbiotic Relationship Between the Profession and the Public*  
 4:10 T. A. Bass and Bruce Weindruch, *The Public and the Past: Awareness, Appreciation, and Action*
- (58) **Symposium: REGIONAL SOCIAL NETWORKS: MEASUREMENT, THEORY, AND EXAMPLES**  
 Constitution  
 Organizers and Chairpersons: Stephen Plog and David P. Braun  
 Participants:  
 1:30 Alan T. Synenki and David P. Braun, *Organizational Theory and Social Inference*  
 1:50 Michael W. Graves, *Kalinga Intercommunity Ceramic Design Differentiation*  
 2:10 Stephen Plog, *The Evolution of Social Networks In the American Southwest*  
 2:30 David P. Braun, *Neolithic Regional Cooperation, A Midwestern Example*  
 2:50 Jerome A. Voss, *The Measurement and Evaluation of Change in the Regional Social Networks of Egalitarian Societies: An Example from the Neolithic of Northwestern Europe*  
 3:30 Michael D. Conner, *Genetic Approaches to Prehistoric Social Organization*  
 3:50 Robert Paynter, *Spatial Processes of Stratification: Interpreting Cores and Peripheries*  
 4:10 Robert Drennan, *Changes in Social Scale and Organizational Complexity: The Tehuacan Valley Analyzed for Comparison*  
 Discussant: H. M. Wobst
- (59) **Symposium: THE ARCHAEOLOGY OF A FRONTIER: RECENT STUDIES IN EL SALVADOR PREHISTORY**  
 Independence  
 Organizers and Chairpersons: Karen O. Bruhns and Jane H. Kelley  
 Participants:  
 1:00 Arthur A. Demarest, *Late Preclassic Interaction in Southern Mesoamerica: The Ceramic Evidence From Western El Salvador*  
 1:15 Jane H. Kelley, *The 1979 Field Season at Cihuatan, Central El Salvador*

- 1:30 Willard Van Asdall, A. Harlan, and Charles Miksicek, *Botanical and Environmental Studies at Cihuatan*
- 1:45 Charles Miksicek, A. Harlan, and W. Van Asdall, *Archaeobotanical Evidence for Post-classic Subsistence at Cihuatan*
- 2:00 William R. Fowler Jr., *Postclassic Intraregional Networks in the Central Basin of El Salvador*
- 2:15 Karen O. Bruhns, *Ceramics, Ethnicity, and Trade: A Diachronic View of the Southern Frontier of Mesoamerica*  
 Discussants: Doris Z. Stone, Wolfgang Haberland, Robert Sharer
- (60) **General Session: HISTORIC SITES ARCHAEOLOGY**  
 '76 Room  
 Chairperson: Elizabeth A. Morris  
 Participants:  
 1:00 Chester B. DePratter, Charles M. Hudson, and Marvin T. Smith, *Juan Prado's Explorations in the Interior Southeast, 1566-1568*  
 1:20 William B. Lees, *Ecology, Economics, and Settlement Change at Limerick Plantation, South Carolina*  
 1:40 Frederick J. E. Gorman, *Computer Analysis of Extensive Artifacts Inventories from Archaeological Sites*  
 1:50 Elizabeth A. Morris and N. Ted Ohr, *An Historic Indian Campsite in North-Central Colorado*  
 2:00 Lawrence E. Babits, *Military Central Place Theory and Historic Sites Archaeology*  
 2:20 Cara L. Wise, *Changing Colonial Settlement Patterns in Delaware's Coastal Plain*
- (61) **General Session: ETHNOARCHAEOLOGY**  
 Cafe Careme  
 Chairperson: Hetty Jo Brumbach  
 Participants:  
 3:00 Priscilla Murray and Claudia Chang, *An Ethnoarchaeological Study of a Contemporary Herders' Site in Southern Greece*  
 3:20 Ben A. Nelson, *An Ethnographic Test of Turner and Lofgrens' Vessel Size Hypothesis*  
 3:40 Susan Kent, *Structuralism and Archaeology-The Understanding of Activity Area Usage*  
 4:00 George Sabo, *An Ethnographic View of Prehistoric Eskimo Adaptation to Climatic Change*  
 4:20 Hetty Jo Brumbach and Robert Jarvenpa, *The Ecological History of Ethnic Adaptations in Central and Subarctic Canada*  
 4:40 James A. Zeldler, *Ethnoarchaeology of an Achuar Dwelling: Some Archaeological Implications*  
 5:00 Claudia Chang and Terry McCabe, *Ethnography for the Complete Archaeologist*
- (62) **General Session: CULTURAL RESOURCE MANAGEMENT**  
 Independence  
 Chairperson: Roy Dickens  
 Participants:  
 3:00 Nancy Bolce, David C. Hurst, Michael McEachern, and Roger C. Nance, *Statistical Analysis in a Cultural Resource Management Study at Fort McClellan, Alabama*  
 3:20 Dave Snyder, *Strip Mining and Archaeology: A CRM Evaluation from Southern Illinois*  
 3:40 Thomas J. King Jr., *The Roles of the Agency Archaeologist in Managing Large Mitigation Programs*  
 4:00 Alan H. Simmons, *Big Buck Archaeology-The Other Side of the Coin*  
 4:10 Thomas R. Lincoln, *Cultural Resource Contracting and the Small Business Set-Aside Program*  
 4:20 Charles R. Smith and Frederick W. Lange, *Historic Sites: Managing a Dynamic Resource*  
 4:40 Richard B. Stamps, *Accountability in Archaeology-Who Owns the Bones?*
- (63) **General Session: INTERPRETATION OF MORTUARY REMAINS**  
 '76 Room  
 Chairperson: C. S. Peebles  
 Participants:  
 3:00 George J. Armelagos and Alan A. Goodman, *The Use of Skeletal Materials for the Analysis of Stress in Archaeological Populations*

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- 3:20 Glen H. Doran, Central California Paleodemography  
 3:30 John P. McCarthy and Stephen H. Graff, Differential Mortality and Status: Implications for Archaeology  
 3:50 Sharon I. Good, Copena Burial Practices and Social Organization  
 4:10 Haskel J. Greenfield, Integrating Archaeological and Epigraphic Information in Mortuary Analysis: The "A" Cemetery at Kish  
 4:20 Caroline M. Stuckert, Roman to Saxon: Population Biology and Archaeology  
 4:40 Anne-Marie Cantwell, Prehistoric Dog Burials in Eastern North America

## ABSTRACTS OF SYMPOSIA

(1) **SOCIO-ECONOMIC CHANGE IN RANKED SOCIETIES PART I: RANKING, PRESTIGE, AND EXCHANGE.** Ranked societies, whose sociopolitical structure is generally less complex than that of State societies, have long been a focus of study in many areas. In recent years the archaeology of ranking has been examined more searchingly, on the basis both of settlement and funerary evidence, and the dynamic relationships between social structure, subsistence production and mechanisms of exchange have been more closely investigated. In this symposium the case studies are drawn primarily from European societies of the prehistoric and early Medieval periods, with the intention of focusing on general issues of culture process under the two general headings of ranking, prestige and exchange, and, production, distribution, and land-use in ranked societies.

(2) **RECENT ARCHAEOLOGICAL RESEARCH IN LOWER CENTRAL AMERICA.** This symposium presents results of some of the most recent archaeological work in Lower Central America. Papers focus on basic problems including chronology and context, subsistence, settlement, and regional contacts. The papers make contributions toward understanding cultural evolution in this region, an understanding which has been severely limited by lack of research.

(3) **PLANT OPAL PHYTOLITH ANALYSIS: APPLICATIONS IN ARCHAEOLOGICAL RESEARCH.** This symposium is the first ever devoted to phytolith analysis in archaeology. It convenes analysts who, only within this decade, are pioneering this research individually. Their papers comprise the "state of the art," far in advance of available publications. These themes are emphasized: field and laboratory techniques; phytolith taxonomy; and, analytical success in studies of paleoenvironment and subsistence. Archaeological periods from Paleolithic to Historic are included. Cultures range from hunters and collectors to early farmers in irrigation civilizations. Examples from Old and New World archaeology demonstrate the near-universal applicability of phytolith analysis in multidisciplinary archaeological research.

(4) **EXPLANATIONS IN HISTORY: PLAINS HISTORICAL ARCHAEOLOGY.** A large quantity of information about the Euroamerican occupation of the plains geographical area is available from recent research. This information allows for recognition of patterning in the empirical record. This patterning can be explained on a number of levels of analysis. This symposium is designed to draw together a series of papers of varied methodological and theoretical interests on several of these levels. Explanations of the recognized patterns are presented from intrasite to interregional contexts. The testing of these ideas may result in a greater explanatory potential for future research into the past Euroamerican occupation, as well as into the working of cultural systems in general.

(6) **COMPUTERIZED DATA BANK MANAGEMENT IN ARCHAEOLOGY.** During the past decade archaeologists have begun to use computerized data banks. Although each application may vary in specific goals and functions, all face similar management issues. This symposium presents several unique examples of how archaeologists are benefiting from computerized data banks and discusses attendant problems and concerns. Papers range from multi-federal agency cooperative applications to state-wide networks to project specific usages. Trends in new computer technology and their implications for future archaeological investigations are explored.

(7) **PROBLEMS OF LARGE SCALE, MULTIDISCIPLINARY REGIONAL ARCHAEOLOGICAL RESEARCH: THE MALYAN PROJECT.** The symposium is organized to provide a discussion of the theoretical, methodological, and administrative problems addressed by the Malyan Project. The first group of papers will introduce the project and cover environmental, mineralogical, palaeo-ethnobotanical, and zooarchaeological studies as well as special studies of sealings and figurines. Here the emphasis will be on analytical techniques peculiar to each study, how these studies are interrelated and how they are responsive to the general objectives of the project. The second group of papers will cover studies of regional settlement patterns and functional variation at Malyan; emphasis will be on analytical problems.

(8) **PREHISTORIC HABITAT, AGRICULTURE, AND SETTLEMENT OF THE PULLTROUSER SWAMP ZONE, NORTHERN BELIZE.** The controversial ground patterns reported in various inundated zones in the Maya lowlands are examined for a large multihabitat depression in northern Belize. Interdisciplinary work indicates that the patterns are Maya-made raised fields and canals of sophisticated construction and function, that current environmental circumstances are similar to those which occurred in the past, that natural ground patterns do not form in the depression, and that the adjacent population was large.

(9) ASCA SYMPOSIUM: ARCHAEOLOGY IN STATE PLANNING FOR HISTORIC PRESERVATION. State historic preservation plans link federal and state programs for the protection of archaeological resources, just as such plans guide programs for historic sites and districts. How can broadly based professional expertise from the archaeological community be integrated into historic preservation planning? The symposium will highlight pilot projects in Arkansas and Massachusetts; will address future directions and alternatives in planning as it affects archaeological remains; and will discuss the relationships between state historic preservation planning and the missions of federal agencies which have protection of archaeological sites among their goals.

(10) CULTURAL RESOURCE MANAGEMENT ON THE OUTER CONTINENTAL SHELF. This symposium provides an introduction to the Cultural Resource Management Program on the Outer Continental Shelf, OCS, which has been developed by the Bureau of Land Management, BLM, Department of Interior. Management of cultural resources on the OCS has resulted in a long-range planning program focusing on the protection of prehistoric and historic marine cultural resources that has been designed to insure that federal and federally permitted activities and projects do not cause avoidable damage or loss of these resources. The development of the OCS program, its structure, and functions will be discussed, and the nature of the four field areas—Atlantic, Gulf Coast, Pacific, and Alaska—will be explained. Recent and current projects are described and the future of the program is discussed.

(11) ARCHAEOMAGNETISM: PROSPECTS FOR IMPROVING TIME CONTROL IN ARCHAEOLOGY. This symposium has been designed by archaeomagnetic specialists to (1) apprise each other of current developments in technique and analysis, and (2) communicate the current potential of archaeomagnetism to the archaeological community. Important advances are reported in field collection technique, theory of thermoremanent magnetism, and statistical analysis. To assess the practical archaeological uses of archaeomagnetism, papers on archaeomagnetic application and prospects for intensity dating are presented, and information exchange between archaeologists and geophysicists is discussed.

(12) SOCIO-ECONOMIC CHANGE IN RANKED SOCIETIES PART II: PRODUCTION, DISTRIBUTION, AND LAND-USE. See (1).

(14) ARTIFACT ANALYSIS AND BEHAVIORAL INFERENCE. This symposium discusses the inferential steps between research design and interpretation. The papers focus on the way analysis is structured to meet research goals, how and why attributes or variables were selected. The analysis of a variety of materials is discussed: stone, bone, ceramics, and metal. Although illustrations are drawn from the Neolithic site of Selevac (Yugoslavia) and the Neolithic levels at Les Tambourets (France), the problems discussed are faced by all archaeologists—how to select and analyze attributes meaningful in the interpretation of past behavior.

(15) EARLY COASTAL ADAPTATIONS IN THE CENTRAL AREA AND ADJACENT REGIONS. Papers and discussion focus on the nature and origins of early cultural adaptations to coastal zones along the Pacific shores of Panama, Ecuador, and northern Peru; additional information is provided by scholars working in Mexico and the Caribbean. Speakers will address several specific questions in addition to presenting their particular data and interpretations. These questions concern (1) the antiquity and origins of coastal adaptations; (2) the nature of the subsistence base and how it may have changed; (3) the evidence for post-Pleistocene climate change and the origins of coastal adaptations; (4) the role of the early coastal peoples in the development of the formative way of life in the Central Area.

(17) CHIPPED STONE ANALYSIS AND THE RECONSTRUCTION OF PREHISTORIC SUBSISTENCE SYSTEMS. This symposium brings together diverse approaches to the study of chipped stone that attempt to establish the bases for inferring tool use and to reconstruct prehistoric subsistence-settlement systems. Recent functional analyses of chipped stone tools have contributed to methods of determining tool function on the basis of micro- and macro-analyses of edge characteristics. This approach has been productive and stimulating; the unit of analysis has generally been individual tools. The papers in this symposium include archaeological and experimental studies aimed at integrating detailed functional analyses into the broader perspective of subsistence-settlement systems.

(18) COLHA, BELIZE: A CHERT TOOL MASS PRODUCTION CENTER OF THE ANCIENT MAYA LOWLANDS. For the first time, the role of chert tools in the development of Maya society can be assessed. This has been made possible by the investigation of a chert tool mass-production center at the site of Colha, Belize. This large site dates from Middle Preclassic to Early Post-classic times. Specialized mass production of chert tools can be recognized throughout the se-

quence, particularly in the late Preclassic and in the Early Postclassic. The symposium describes the findings of the 1979 and 1980 seasons. The nature of the chert-production systems, chronology, ceramic studies, architectural research, and subsistence and environmental studies will be examined.

(21) ARCHAEOLOGICAL SITE PROTECTION IN THE PRIVATE SECTOR: PROBLEMS AND PROSPECTS. A series of papers on various methods and problems in providing protection to archaeological sites on private land is presented. Particularly stressed are easements and outright acquisition as protection methods.

(22) ARCHAEOLOGY AND THE WIDER AUDIENCE. Archaeologists have frequently ignored the general public and have, like other specialists, lagged behind in their efforts to communicate with lay people and to work effectively with interested amateur archaeologists. This panel explores the difficulties of popularizing archaeology, and some of the strategies used in the United States and elsewhere to work with and train amateur archaeologists. Four position papers will be followed by a lengthy panel discussion, in which experts at communicating archaeology to a wider audience will participate.

(26) ADVANCES IN STUDYING REGIONAL EXCHANGE SYSTEMS. The symposium will concentrate on methodological concerns in studying prehistoric exchange. Previous research has dealt with notions of exchange such as reciprocity and redistribution which are both too general and not operational archaeologically. To redirect studies of exchange our goal is to identify issues that can be investigated concretely. The variable effects of boundaries, transportation systems, types of goods, and different social context assume importance. The conditions that lead to the development of exchange are best viewed through the modes of consumption and production. The symposium will emphasize the development of techniques to investigate these issues.

(27) NEW PERSPECTIVES ON MOGOLLON PREHISTORY—THE MIMBRES AND RESERVE BRANCHES. Recent research in the areas occupied by the Mimbres and Reserve Branches of the Mogollon is enabling the reevaluation of certain ideas about these people. The session begins with a reexamination of the Branch concept and its use as a means of differentiating various cultural complexes. Chronological issues such as the validity of particular phases are also considered. Delineation of settlement patterns and explanations of the processes involved in their changes are discussed. Three major settlement periods are examined: the pithouse period, the sedentary and growth period, and the abandonment and aggregation period. Modifications in the subsistence base are studied as a means of explaining shifts in settlement patterns. Reassessment of the history of cultigen development in the study area is also presented. Finally, issues of trade, exchange, and pottery production are examined.

(28) THE SOUTHEAST MESOAMERICAN PERIPHERY: COPAN AND QUIRIGUA. The papers presented in this symposium are based upon results of work recently completed at the Maya centers of Copan and Quirigua. While these papers will be concerned with the presentation of this newly gathered data, the primary emphasis of the contributions will be on synthesis and interpretation. The categories of data examined here, glyphic inscriptions, art and iconography, architectural style and sequence, ceramics and settlement patterns, will be considered with respect to intrasite prehistoric economic, political, and social processes. The relationships between centers will also be considered.

(29) SITE SURVEY IN SOUTHERN NEW ENGLAND: TOWARD A SETTLEMENT MODEL. In recent years the archaeological record of southern New England has been systematically examined by a number of investigators. This work has been characterized by an emphasis on prehistoric subsistence and settlement analysis with a predictive and explanatory model as the ultimate goal. This symposium proposes to bring together people involved in major ongoing survey projects and those responsible for state and federal funding. Our goal is to facilitate communication among those working toward a regional settlement model as well as to inform the archaeological community of our methodologies and research results.

(31) THE DOLORES ARCHAEOLOGICAL PROGRAM, SW COLORADO. The scale of very large mitigation studies such as the Dolores Archaeological Program permits an effective regional and multidisciplinary approach to the reconstruction of past lifeways and to the study of process in linked cultural and environmental systems. Such large projects also raise special problems of managing data, personnel, and research operations. This symposium summarizes selected research results from the Dolores Archaeological Program after nearly 2 years of operation, and reports on this project's approach to the opportunities and problems of large-scale archaeological studies.



(32) CUELLO 1980: PRELIMINARY PAPERS. The Early Formative Maya site of Cuello, Belize, has yielded much new information on the settlement, ceramics, economy, and trade of an early sedentary society in the Mesoamerican tropical lowlands. Excavations of 1976-79 have been continued in 1980 with the exposure of further large areas of Early Formative architecture and associated features; these are discussed in the several papers of this symposium.

(36) LOCATIONAL MODELS: IMPLICATIONS AND ALTERNATIVES. This symposium is intended to offer insights into current applications of locational models in archaeology. While the topics may be limited in scope, the papers presented in this session are designed to focus on (1) possible favorable or adverse implications of some models, or (2) alternative approaches. Ecological, organizational and regional spatial relationships will be addressed. The symposium is designed to develop critical reviews and ideas about the use of locational models in the study of intersite relationships.

(38) SOIL AND PATTERNS OF PAST HUMAN BEHAVIOR. The symposium, sponsored by the Soil Banque, will focus on the methodologies that can be used to analyze anthropogenic soil and infer patterns of past human behavior. The participants constitute an international panel of researchers interested in soil analysis. The sedimentary structure and biogeochemical and geochemical composition of the soil appear to be important indicators of past human activities. The contributors present a number of illustrations of the potential of soil analysis including land use, construction, location of site perimeters and specific activity areas, and plant and animal use. Since the soil undergoes continuous transformations, several papers examine the nature and agents involved in dynamic change. The symposium provides an overview of existing and new methods, and illustrates the rich potential of these lines of investigation.

(39) THE SOUTHEAST MESOAMERICAN PERIPHERY: WESTERN HONDURAS AND EL SALVADOR. Ongoing and recently completed archaeological projects in Honduras and El Salvador are extending our knowledge of the Southeast Periphery of Mesoamerica. The papers presented here deal with several of these projects and their aspects: settlement, chronology, trade, and communications networks. In addition, the ceramics of Quirigua, Copan, and other areas of the Periphery are compared and discussed. The papers' temporal span is the Middle Preclassic to the Terminal Postclassic. Throughout, emphasis will be placed on intra- and inter-regional development and relationships.

(40) THE FORT ANCIENT TRADITION: NEW PERSPECTIVES ON THE LATE PREHISTORY OF THE MIDDLE OHIO VALLEY. It is difficult to fit recently acquired data on Fort Ancient into the existing archaeological construct(s). Griffin's Fort Ancient Aspect (1943) and Prufer and Shane's Fort Ancient Tradition (1970) have assumed far greater internal homogeneity and historical relatedness of phases than data now support. Fort Ancient can no longer be viewed as a series of primarily ceramic diachronic stages that reflect both Mississippian intrusion and the increasing Mississippianization of a relatively homogeneous autochthonous Woodland population. The greater diversity observable in recent research on Fort Ancient requires formulation of an alternative model of Fort Ancient, making explicit those consequences of the paradigm by which it is structured, and illustrating those archaeological and historical data that it must encompass.

(41) THE SIMPLE AND COMPLEX SOCIETIES OF WEST AND NORTHWEST MEXICO: PART I. West and northwest Mexico have long been considered peripheral to the events and processes that formed Mesoamerican civilization. The abundant archaeological, ethnohistorical, and ethnoarchaeological data that have been assembled in recent years not only expand our knowledge of the area's culture history, but demonstrate that its precontact cultures were far more complex than previously thought. Data also show that these areas were important to developments in the Mesoamerican "heartland" and may hold the key to a better understanding of Mesoamerican-Southwestern relationships. The native peoples of the area today are a rich source of information for archaeologists.

(42) COMING OF AGE IN ARKANSAS: THIRTEEN YEARS OF THE ARKANSAS ARCHAEOLOGICAL SURVEY. The accomplishments and shortcomings of the Arkansas Archeological Survey, a pioneering institution in its state-wide approach to archaeological research and cultural resource management, are presented in papers and reviewed by a panel of discussants. The papers include both summaries of regional prehistory within Arkansas and topical subjects, such as archaeomagnetic dating, contract archaeology, rock art, the amateur certification program, and historical archaeology in the State. Research accomplishments at the Parkin and Toltec sites, as well as plans for future investigations, are presented.

(43) FROM FLINT RIDGE TO VERA CRUZ: LITHIC RESOURCES IN THE NORTHEAST. In recent

years, archaeologists have demonstrated considerable interest in discovering and analyzing sources of stone used by prehistoric people in the Northeast. Quarries were an important and integral part of prehistoric economies, and many stone materials also entered prehistoric trade systems. This symposium will draw together for the first time many of the people concerned with lithic resources in the region. Formal papers will highlight areas of current research, such as characterization of sources and analysis of quarry activities. The symposium will also offer an opportunity for informal exchange of information about, and samples from, important Northeast lithic sources.

(44) ENERGY AND ARCHAEOLOGY: RESPONSE TO A NATIONAL PRIORITY. In light of the President's message regarding development of new energy resources, federal agencies and the archaeological community must reassess their stance on cultural resource issues. The symposium will allow various state and federal agency archaeologists to discuss plans and procedures, as well as potential problems they perceive for the continuing protection of cultural resources. Comments and discussion from the audience will be actively encouraged in an effort to provide a productive exchange of dialogue on these pertinent issues.

(45) AMERICAN INDIANS AND ARCHAEOLOGY TODAY. Contemporary Native Americans are increasingly taking action and gaining attention in regard to their special interests, needs, and concerns for their archaeological heritage. Some of these Indian points-of-view are presented, particularly on recent legislation affecting the excavation and disposition of Indian sacred sites and materials, and human remains. Tribal-archaeological dialogue and collaboration are increasing; several policies, investigations, and programs of mutual benefit to both American Indian cultural heritage and to archaeology are described.

(46) CONTEMPORARY ANDEAN CULTURAL CONTINUITY THROUGH ARCHAEOLOGICAL INQUIRY. Recent studies of contemporary patterns of Andean behavior, socioeconomic organization and classificatory principles are presented. Each participant archaeologically examines a different indigenous group. The purpose of the symposium is to measure and evaluate the temporal and spatial variability of specific Andean behavioral and cognitive patterns, reflected through the utilization, distribution, and classification of material goods. The goal of each participant is to demonstrate that these patterns represent vestiges of cultural continuity in Andean social, economic, and ideational structures, and to explain past behavioral patterns in the archaeological record.

(47) EXCAVATION AT THE SHAWNEE MINISINK SITE: REPORTS ON 11,000 YEARS OF CULTURAL AND ENVIRONMENTAL HISTORY IN EASTERN NORTH AMERICA. The focus of this symposium is a report on research undertaken by the Upper Delaware Valley Early Man Project in northeastern Pennsylvania. Excavation at the Shawnee-Minisink site, located at the confluence of the Delaware River and Brodhead Creek about 3 km northwest of the Delaware Water Gap, revealed deeply stratified cultural components spanning from Paleoindian to Late Woodland periods. Extensive paleoecological and subsistence data were also recovered. Research reports deal with site excavation methodology, chronological sequences, environmental reconstruction, typological considerations, culture change and process, and isolation of living floors in compact stratigraphy.

(48) CURRENT RESEARCH AT THE ABBOTT FARM NATIONAL HISTORIC LANDMARK. The Abbott Farm National Historic Landmark, a 1700-acre district located near Trenton, N.J., received national and international attention in arguments addressing the antiquity of humans in North America. Current research has turned to its unique Middle Woodland occupations excavated between 1936 and 1940 in a portion of the landmark called the Abbott Farm. The papers in this symposium are based on studies of excavated materials that had never been analyzed or studied in detail. The materials assessed are human osteological remains, faunal remains, and argillite artifacts. Evidence from these studies is combined with other data to form a preliminary settlement model.

(49) URBAN ARCHAEOLOGY IN PHILADELPHIA. The symposium will focus on Philadelphia as a single archaeological site that, through the process of urbanization, has undergone considerable spatial and temporal change. Included within the symposium are six individual papers covering topics of predictive modeling and sampling, site excavation, artifact patterning, neighborhood comparisons, the use of historic documentation, and the relationship of urban archaeology to the concerns of historic preservation. Discussants will focus, first, upon an overview of the development and course of Philadelphia urban archaeology, and, second, upon the contributions of Philadelphia archaeology to general and theoretical research interests concerning processes of

urbanization. A brief introduction to Philadelphia urban archaeology will precede the presentation of papers.

(50) SOCIAL, POLITICAL, AND ECONOMIC ORGANIZATION IN THE COASTAL ENVIRONMENT. In an effort to consider theory and issues in coastal archaeology beyond the traditional subsistence-oriented research common to many earlier symposia and publications, this symposium will present current studies that discuss general coastal theory published to date, prehistoric coastal sociopolitical organization, population dynamics, coastal settlement types, and comparative coastal-inland resource stability and productivity. These presentations serve well to emphasize the scarcity of most forms of extant research save subsistence-focused coastal archaeology and provide some examples of fresh approaches to the analysis of social, political, and economic aspects of coastal adaptations.

(51) SITE LOCATIONAL STRATEGIES IN HEAVILY VEGETATED AREAS. A frequently encountered problem in archaeological survey is the existence of heavy ground cover. This problem is especially prevalent in the southeastern United States or other areas where forest cover is prominent and timber harvesting is a major economic activity. Locational data are crucial to cultural resource management as well as research into settlement patterning or even subsistence potential. This symposium will provide opportunity for discussion as well as offering a number of papers presenting current activities and techniques for both the discovery of sites and the utilization of the data so derived. Emphasis will be on practical problem-oriented anthropological approaches to cultural resource management decisions and associated research aims.

(52) COROZAL POSTCLASSIC PROJECT—INTERIM REPORT. Although the Corozal Postclassic Project session will present the preliminary results of two seasons of excavation in northern Belize, it is also designed to exemplify the interplay that excavation and scientific analysis can have in a well-planned archaeological program. In this light, the importance of individual contributions to the whole symposium can be seen through the papers which will be presented. Additionally, the symposium seeks to address itself to the theoretical questions that are being investigated. Partial solutions to these theoretical questions, as well as the ways in which they may be tested and answered, will be proffered.

(53) THE SIMPLE AND COMPLEX SOCIETIES OF WEST AND NORTHWEST MEXICO: PART II. See (41).

(57) THE IVORY TOWER IN THE COMMUNITY: SCHOLARSHIP AND THE PUBLIC IN ALEXANDRIA, VIRGINIA. The interplay between academic and community needs is discussed in relation to the development and implementation of a public archaeology project within the City of Alexandria, Virginia. Specific papers are presented on the Alexandria Urban Archeology Project's research and organizational design, survey methods/results, and site excavations; these formulate a city data base for determining historic socioeconomic patterns, model testing, preservation planning, public formats, and volunteer contributions. The four project components of research, management, interpretation, and education are emphasized and their relationships, funding, and administration are discussed in reference to the goals of public archaeology.

(58) REGIONAL SOCIAL NETWORKS: MEASUREMENT, THEORY, AND EXAMPLES. While archaeologists have become more sophisticated at constructing models for the occurrence of specific social phenomena, problems remain both in modeling the organizational properties and in evaluating the models through the indirect measurement of such properties. The papers in this symposium examine issues underlying the idea of archaeologically measuring properties of social networks and/or give examples of developing and applying specific measurements to societies at various levels of organizational complexity.

(59) THE ARCHAEOLOGY OF A FRONTIER: RECENT STUDIES IN EL SALVADOR PREHISTORY. Current and recently completed investigations in El Salvador have both enlarged our picture of events on the southern periphery of Mesoamerica and suggested that some major changes in viewpoint about this area are in order. Some of these new data will be presented and their importance and bearing on problems in Mesoamerican and Central American studies will be discussed by three persons with exceptional experience in the prehistory of both Meso- and Central America.

## Abstracts of Papers

Abernathy, Leslie C. (Arkansas Arch. Survey) THE OTHER FOUR AND A HALF CENTURIES: HISTORICAL ARCHAEOLOGY IN ARKANSAS The 450 years of the changing human presence in Arkansas after Columbus provide research opportunities that encompass the entire range of problem-oriented historical archaeology. The statewide focus of the Arkansas Archeological Survey is encouraging an awareness of these historical research opportunities and needs. The guidance for research provided by a recently completed consideration of state-level research design incorporates an operational definition of the field of historical archaeology as a technique best undertaken in a research environment tied to an appreciation of holistic, relative, and dynamic perspectives vital to the anthropological viewpoint. Specific historical projects are summarized. (42)

Abrams, George H. J. (Seneca-Iroquois National Museum) AMERICAN INDIAN RELIGION, LAW AND MUSEUMS Major legislation and court cases, passed and pending, directly relate to the area of American Indian material culture. These laws address themselves to the subject of American Indian religion, "cultural sensitivity," and the return of items often ambiguously defined as "religious." These include items of osteological material, grave goods, and ethnographic material held by universities, museums, and in private collections. This presentation discusses current status, suggestions for possible avenues of cooperation, and the implications of such laws as the American Indian Religious Freedom Act of 1978 and the Archeological Resources Protection Act of 1979, especially as these apply to the tribes in the Northeast United States. (45)

Accola, Richard M. (Texas-Austin) INTER- AND INTRA-COMMUNITY ORGANIZATION OF THE RESERVE PHASE MOGOLLON OF THE MIDDLE SAN FRANCISCO RIVER REGION Recent survey of Reserve Phase (ca. A.D. 1000-1100/1150) occupations in the middle San Francisco River drainage region has supplied data focused on the spatial organization of Mogollon communities. Relationships between sites situated along the river and those located in upland regions are discussed. Spatial layout of different features within naturally defined areas are analyzed in terms of their social organization. Hypotheses for future research in the area are presented. (27)

Adams, John (see Hansell, Patricia) (5)

Adams, R. E. W. (Texas, San Antonio) and Fred Valdez Jr. (Harvard) THE CERAMICS OF COLHA, 1979-1980 SEASONS Two seasons of ceramic analyses at the site of Colha, Belize, have provided data on a ceramic sequence beginning at ca. 600 B.C. (Mamom sphere) and terminating at ca. A.D. 1250 (New Town sphere). Strong ceramic developments are seen in Chicanel (Late Preclassic) and Early Postclassic times, perhaps correlated with periods of intensive lithic production and export. (18)

Adovasio, J. M. and W. C. Johnson (Pittsburgh) THE APPEARANCE OF CULTIGENS IN THE UPPER OHIO VALLEY: A VIEW FROM MEADOWCROFT ROCKSHELTER Meadowcroft Rockshelter is a deeply stratified multicomponent site in Washington County, southwestern Pennsylvania. The 11 well-defined stratigraphic units identified at the site span at least 16,000, and perhaps 19,000, years of intermittent occupation by groups representing all of the major cultural stages/periods now recognized in northeastern North America. Though predominantly known for the Paleoindian components associated with lower and middle Stratum IIa, of comparable significance are the early cultigens recovered from Stratum IV. The lower occupational floors in this level, dated between 870 ± 75 B.C. and 705 ± 120 B.C., yielded *Cucurbita* sp. in undisturbed contexts while the upper floors in this unit produced ears of 16 row *Zea mays*, dated between 375 ± 75 and 340 ± 90 B.C. The attributes of these, the earliest well-dated cultigens in the Upper Ohio Valley, as well as the associated artifacts are summarized, and the implications of these materials for the appearance and dispersal of cultigens in the study area are discussed. (33)

Adovasio, James M. (see Johnson, William C.) (40)

Agurcia F., Ricardo A. (San Pedro Sula) LATE CLASSIC SETTLEMENTS IN THE COMAYAGUA VALLEY A series of Late Classic sites in the Comayagua Valley of Central Honduras are analyzed in terms of the spatial distribution and composition of the architectural remains within them. The patterns observed are compared to those of contemporaneous settlements from better known areas. Much of the data presented is new for the Central Honduran Highlands and comes from surface surveys. (39)

Albright, Shirley S. and Lorraine E. Williams (New Jersey State Museum) **DIFFERENTIATION OF FINE-GRAINED SEDIMENTARY AND METAMORPHIC ROCKS UTILIZED BY PREHISTORIC POPULATIONS OF THE MID-ATLANTIC REGION** The identification of artifacts made of fine-grained sedimentary and metamorphic rocks can be accomplished through a combination of petrographic techniques. The examination of grain size and boundary will differentiate siltstones and shales from detrital or chemical argillites, slates and hornfelsed rocks. Indurated and metamorphosed specimens can be distinguished via x-ray diffraction. Synthesized extant geological data in combination with field studies permit the mapping of prehistoric quarry locations. Petrographic analyses of fine-grained artifacts from New Jersey, coastal New York and the Hudson Valley permit studies of the procurement and utilization of argillite and hornfels by prehistoric populations from Archaic through Woodland times. (43)

Albright, Shirley S. (see Williams, Lorraine E.) (48)

Alden, John R. (Duke) **BANESH PERIOD SETTLEMENT** The Banesh Period (3400-2600 B.C.) marks the introduction of lowland populations and sociopolitical concerns into the Kur Basin. Population size and regional organization are discussed for each of the period's five phases. The settlement patterns indicate an initial phase of immigration into the region which was probably related to the expansion of long-distance trade. This is followed by a period of slow growth, a second wave of immigration and a period of internationalism, and finally by a phase of regional isolation and gradual population decline. (7)

Allen, Ralph (see Nagle, Christopher) (43)

Ames, Kenneth M. (Boise State) **THE DEVELOPMENT OF VILLAGES IN WESTERN NORTH AMERICA** Clusters of pithouses appear in various portions of western North America between 6000 and 4000 years before present, among nonagriculturalists in the Great Basin, Intermontane Plateau, and Pacific Coast. It is argued in this paper that (1) present theoretical and operational definitions of villages used in these areas are inadequate; (2) that as pithouses are widely distributed in time and space, their presence cannot be explained by reference to particular cultural or historical traditions. Villages are precipitated from the conjunction of intensifiable resources and particular population structures. (3) Pithouse clusters are temporally unstable and the processes that bring them into being are not the processes that may maintain them for long periods of time. (20)

Anyon, Roger and Patricia A. Gilman (New Mexico) **A RE-EVALUATION OF THE MIMBRES-MOGOLLON ARCHAEOLOGICAL SEQUENCE** Recent work in the Mimbres Valley of New Mexico has altered the published archaeological sequence. A previously unrecognized early plainware pithouse periods has been identified and dated at A.D. 200-500. A new series of radiocarbon and tree-ring dates has modified the dates of the phases between A.D. 550-1000, and changed the terminal date of the Classic Mimbres to A.D. 1150. The traditionally accepted Mangus phase is now shown to be non-existent. These refinements of the sequence and the recognition of cultural continuity throughout the occupation of the area negate any notion of an Anasazi takeover at A.D. 1000. (27)

Anzalone, Ronald D. (HCRS) **THE ARCHAEOLOGIST AS "ENVIRONMENTALIST": USING AND ABUSING NEPA** If archaeologists are to have an effective voice in energy development and other national development programs in the future, they should be aware of how the National Environmental Policy Act has both supported and failed archaeology in the decade since its passage. State and federal agency planning priorities and the extent to which they become involved in archaeological programs obviously vary depending on their missions, land managing responsibilities, and the specific locations and types of projects they undertake or support. However, as generally recognized by the Council on Environmental Quality's new regulations, the key to the fullest possible consideration of archaeological resources throughout the country is the involvement of archaeological interests as early as possible in the planning process. (44)

Archer, S. (see Zimmerman, L. J.) (36)

Armstrong, George J. and Alan A. Goodman (Massachusetts-Amherst) **THE USE OF SKELETAL MATERIALS FOR THE ANALYSIS OF STRESS IN ARCHAEOLOGICAL POPULATIONS** Patterns of morbidity provide methods for the analysis of stress in archaeological populations. Skeletal indicators of infection and nutritional deficiency are used as measures of a population's health and adaptation. The frequency and severity of porotic hyperostosis (iron deficiency anemia), premature osteoporosis (bone demineralization), Harris lines, and enamel hypoplasias are especially effective markers of nutritional stress. The use of these markers is applied to a pop-

ulation undergoing rapid subsistence change. Research on the Dickson Mounds Population (Illinois, 950-1300 A.D.) shows a significant increase in infectious and nutritional stress with changes to primary food production. (63)

Arnold, Christopher J. (Leeds) **STRESS AS A STIMULUS FOR SOCIO-ECONOMIC CHANGE: ANGLO-SAXON ENGLAND IN THE SEVENTH CENTURY A.D.** An example of rapid change in socioeconomic structure as the result of internal and external stress is analyzed. The social, economic and religious structure of Anglo-Saxon England in the seventh century A.D. underwent a dramatic change which has been accepted but not understood by archaeologists. It is argued that the changes were the result of stress placed upon a rapidly evolved ranked social structure within a nonmarket economy. These changes resulted in a more ranked society and a market economy which emerged after a period of economic recession. (1)

Arnold, Dean E. (Wheaton) **CERAMIC STYLISTIC CORRELATES OF A COMMUNITY OF POTTERS IN QUINUA, PERU** Although systems archaeologists argue that ceramic style can provide information about social structure, few ethnographic data support this assumption. The results of an etic behavioral analysis of design features of Quinua pottery indicate that aspects of style which have a high frequency in the sampled categories appear to be coincidental with the stylistic conventions of the community. Conventions include design structures, specific types of motif and band symmetry, and the association of particular designs with specific design zones. These data suggest that the use of design elements in ceramic style analysis rather than design structure and symmetry will miss important information that may have social structure correlates. (46)

Arnold, Jeanne E. (UC-Santa Barbara) **THEORETICAL CONSIDERATIONS FOR COASTAL ADAPTATIONS** This presentation identifies and synthesizes the theoretical issues which have appeared in published reports to date on coastal adaptations worldwide. Unfortunately, it is found that little effort has been expended among published archaeologists to either employ extant general anthropological theory or to frame coastal research in a manner encouraging the generation and application of a uniquely coastal body of theory, or at least a specific analytical approach and structure for the study of coastal adaptations. Several variables and hypotheses relevant to the development of a theoretical structure for coastal archaeology are discussed in response to this void in the literature. (50)

Arundale, Wendy Hanford (AHP-CPSU, Alaska) **A CHALLENGE IN RESEARCH DESIGN: THE ALASKA NATIVE HISTORIC SITES PROJECT** The Alaska Native Historic Sites Project makes some special demands on its research design. Two research design concepts help the project meet these special requirements: (1) a flexible design format incorporating a Parent Design and Offspring Design and Offspring Designs and (2) a design matrix specifying levels of inquiry and problem domains. This paper discusses these two concepts and provides examples of how they work. It also suggests how these concepts may be useful to other projects with similar special requirements. (24)

Ashmore, Wendy (Pennsylvania) **THE CLASSIC MAYA SETTLEMENT AT QUIRIGUA** The existence of a lowland Maya elite center at Quirigua during Late Classic times (ca. A.D. 600-900) has been recognized for some time. Only within the last five years, however, has information emerged that bears on the size and structuring of the local resident population, and on antecedent occupations of the floodplain. This paper first presents an overview of the organization of settlement at Quirigua, primarily in socioeconomic terms, with reference principally to the Late Classic. Attention is then given to newly discovered data on Early Classic occupation, affording a diachronic perspective for a summary interpretation of the roles and *raison d'être* of this Maya center. (39)

Aten, Lawrence E. (Heritage Conservation and Recreation Service) **HISTORIC PRESERVATION PLANNING: THE NEED AND PROMISE** The process of providing answers to the fundamental planning questions necessary for historic preservation to participate in land-use management decisions has a high potential for conflict and a low capacity for conflict resolution. This situation must be resolved if social penalties are to be avoided. Use of systems-based planning models seems to offer the major prospect for an efficient planning interface between technical disciplines in historic preservation and land use management so that historic preservation will be able to compete with major forces such as fiscal comparison, inflation, and energy development in the coming decade. (9)

Babits, Lawrence E. (Brown) **MILITARY CENTRAL PLACE THEORY AND HISTORIC SITES ARCHAEOLOGY** The use of military orderly books to derive a model of central places which move through space and are defined by time on site has applicability to virtually all historic sites archaeology. This approach can aid in the determination of importance of site potential over a

whole series of campsites occupied by the same group. While this has been taken from a military context, it is believed that civilian applications are also of some use. (61)

Babitz, A. D. (see J. E. Ericson) (26)

**Bamforth, Douglas B. (Santa Barbara) STONE TOOL FUNCTION AT LUBBOCK LAKE: BEYOND BISON PROCUREMENT IN GREAT PLAINS PREHISTORY** Proper microscopic technique is necessary to view microwear polishes. Lack of attention to this renders useless most recent evaluations of this approach to microwear analysis. Analysis of the lithic assemblage from the Lubbock Lake Site, using this technique, demonstrates its potential for detailed reconstruction of prehistoric tool function and subsistence. Combining this work with detailed environmental reconstruction at the site helps to illuminate the underlying reasons for formal assemblage variability and to deal more effectively with prehistoric decisions regarding available resources. (17)

**Banks, Thomas J. (California) ARCHAEOLOGICAL SURVEY BY MULE-BACK** A man on a mule can cover 4 to 6 times more land than a man on foot when looking for archaeological sites. In contract archaeology this can mean a tremendous economic savings to the company and client. Efficiency in ground coverage is not sacrificed, but rather increased due to less fatigue and better visibility. Test situations have been conducted where bipedal surveyors and mule-back surveyors covered the same ground, mule-back surveyors have located more sites than their opposition and in less time. (5)

**Barber, Michael B. (USDA Forest Service) SETTLEMENT PATTERN VARIATION DUE TO DISTINCTIVE GEOMORPHOLOGICAL FEATURES: THE COEBURN EXCHANGE INVENTORY, WISE COUNTY, VIRGINIA** A cultural resource inventory was undertaken in a highly vegetated area of Wise County, Virginia. A variety of survey strategies were utilized including the application of site location predictive models as developed in similar areas of restricted surface visibility. Existing models, however, fail to consider the presence of distinctive geomorphological features, in this case rock shelters, which alter settlement patterning. It appears that attributes utilized in other studies to predict the location of prehistoric sites (close proximity to water, high order streams, stream intersections, level terrain) are not pertinent to the area. Additional altering geomorphological features are suggested. (51)

**Barker, Graeme (Sheffield) SOCIO-ECONOMIC CHANGE VERSUS THE ITALIAN PEASANT** Although the prehistory of central Italy has traditionally been regarded as a sequence of increasingly complex systems of technology, subsistence, resource exchange, and social organization, it can now be seen that periods of sudden and profound change alternated with periods of great stability. All neolithic societies here have normally been characterized as egalitarian, but in fact many of them had achieved considerable ranking by the fourth millennium B.C. On the other hand, many communities were still fundamentally the same as these three thousand years later, at the end of the prehistoric era. Why did ranked peasant societies develop when and where they did in central Italy, and what kept society in general so stable for so long? (12)

**Barnes, Mark R. (Technical Preservation Services/HCRS) THE HISTORIC PRESERVATION FUND** The Historic Preservation Fund, established by the 1966 National Historic Preservation Act, is a matching grants-in-aid program, administered by individual State Historic Preservation offices. Since the program's inception, these funds have been used to acquire and develop for public interpretation a number of major prehistoric and historic archaeological sites. Recently, however, the aims and types of eligible projects have been expanded to meet the needs of the archaeological resources and the profession. (44)

**Barnes, Mark R. (Heritage Conservation & Recreation Service) PRESERVATION OF ARCHAEOLOGICAL SITES THROUGH ACQUISITION** Fee Simple acquisition is the best means of preserving an archaeological site or district. As a preservation tool it offers the archaeologist an opportunity to protect sites important for both their research and public education value. There currently exist several federal agencies, state and local entities, and private groups which fund the purchasing of archaeological sites. This paper is intended to inform the archaeological community of some of the possibilities to them beyond salvaging the data or losing the site. (21)

**Basalik, Kenneth J. (Temple) URBAN PATTERNING IN PHILADELPHIA** This study tests the applicability of quantitative methods in the interpretation of localized urban contexts. By utilizing the functionally structured quantitative method of Stanley South, the author identifies patterning in the sealed contexts of several well and privy structures excavated at Franklin Court in Philadelphia. The patterns demonstrate temporal change in the archaeological record reflective of an

ongoing process of cultural and behavioral change. Comparison of these patterns with South's Carolina Pattern reveals close similarities. These similarities reinforce the concept of a unified British-American cultural complex on the east coast of North America in the late eighteenth century. The hypothesis, suggested by Cosans (1974), rejecting behavioral implications of well and privy fill, is thus refuted. (49)

**Bass, T. A. and Bruce Weindruch (Alexandria Archaeological Research Museum) THE PUBLIC AND THE PAST: AWARENESS, APPRECIATION, AND ACTION** Interpretation of archaeological data is the last stage of the research process; yet, this interpretation is usually done at the academic level through scholarly publications. The Alexandria Archaeological Research Museum (AARM) serves as the public information focus for the city's archaeological research. Emphases are placed on explaining the city's evolution, demonstrating research methods in a "living" exhibition, and demonstrating conservation needs within an urban environment. Additionally equipped with a seminar area for volunteer orientation and training, the AARM is conceived as a community center for intellectual or recreational pursuits. (57)

**Batcho, David G. (see Rice, Don S.) (56)**

**Baudez, Claude F. (Proyecto Arqueologico Copan) ICONOGRAPHY AND HISTORY AT COPAN** The monumental sculpture at Copan experiences major changes as much in technique and style as in iconography during the first years of the reign of 18 Rabbit. On the stelae, the ruler seems to play a larger role than in the past, amidst a more complex cosmogony which emphasizes dualism. At the same time, zoomorphic altars replace the geometric, earlier ones; later they will gather growing importance, bearing inscriptions and elaborate scenes, to the prejudice of the stelae, which seem to vanish. (28)

**Baus de Czitrom, Carolyn (INAH) ETHNOHISTORY AND ARCHAEOLOGY OF THE TECUEXES AND COCAS OF JALISCO: AN ATTEMPT AT CORRELATION** To learn more about the Postclassic period in West Mexico, our project is attempting to correlate ethnohistorical information with that of archaeology for certain groups who lived in Jalisco and Zacatecas in the sixteenth century. The study began with the Cocas and Tecuexes. By investigating early sources we identified towns they occupied and established maps of their regions. At the same time available information about their cultures was assembled. A survey is in progress of archaeological sites believed to represent those ancient towns. Through comparative studies of site maps, architectural features, and surface material, we are attempting to identify remains of the various groups. (41)

**Bayham, Frank E. (Arizona State) THE EFFECT OF SEDENTISM ON ANIMAL PROCUREMENT AT VENTANA CAVE** Investigations of the nonworked faunal material from Ventana Cave, Arizona (Haurly 1950), reveal a dramatic change in the proportional representation of species through time. Early horizons (Archaic/Cochise) contain a much greater number of small species, such as jackrabbits, while later horizons contain a preponderance of large desert artiodactyls. Hypotheses purporting to account for this difference are derived from ecological models of optimal diet and focus on the relationship between socioeconomic organization and foraging behavior as is manifest at cave localities. It is concluded that the change in pattern of animal exploitation at Ventana Cave is due to a regional shift to a sedentary settlement pattern. (55)

**Beaudry, Marilyn P. (UCLA), Ronald L. Bishop (Brookhaven National Laboratories), Richard M. Leventhal (Harvard), Robert J. Sharer (Pennsylvania) TYPOLOGICAL AND COMPOSITIONAL ANALYSIS OF CLASSIC PAINTED CERAMICS IN THE SOUTHEAST MAYA AREA** Cooperative research undertaken by several archaeological projects is summarized according to several goals: (1) definition of Classic period southeast Maya ceramic units based upon typological and compositional criteria; (2) the chronological and spatial determination of a southeast ceramic region; and (3) the reconstruction of past economic and sociopolitical interactions in the southeast region. Particular type-variety units, defined by the current research programs, were selected for their widespread distribution in this area and for their distinctive paste and stylistic attributes. These typological units were then tested by compositional analysis, neutron activation supplemented with petrographic examination carried out in collaboration with Brookhaven National Laboratories. (39)

**Becker, Marshall J. (West Chester) STEATITE RESOURCES IN THE NORTHEASTERN UNITED STATES: DISTRIBUTION AND POTENTIAL FOR IDENTIFICATION** Limited attempts to trace prehistoric trade routes in the northeastern United States using neutron activation analysis of steatite have been presented as being quite successful. However, the methodology employed in these early researches may be of limited value and previous conclusions can be questioned. At-

tempts to improve the potential of such studies through greater control of variables suggests that archaeologists need more sophisticated analytical techniques to achieve even marginal objectives. (43)

Beckerman, Ira C. (Penn State) **THE USE OF OPTIMAL FORAGING THEORY IN DEVELOPING PREDICTIVE SETTLEMENT MODELS** Predictive settlement pattern models have, in the past, suffered from the lack of theory or misapplication of ecological theory. Optimal foraging theory has great potential in the development of a theory of settlement and subsistence. The definition of an optimal diet as one which maximizes net energy per unit time is operationalizable into both subsistence expectations and into a geographical problem of optimal site location. The latter is developed through the use of soil survey data, and an algorithm is presented to yield spatial expectations. (35)

Beetz, Carl (see Davenport, Michael) (32)

Beidleman, D. Katharine, T. E. Davidson, R. P. Napoli, R. Wheeler and M. Weiss (Alexandria Archaeological Research Center) **CREATING A DATA BASE: THE CITY'S TEST SQUARE** Excavations on one city block in the historic district of Alexandria, Virginia, provide a controlled archaeological data base for studying middle class households in an urban setting. A syncretic analysis of several categories of archaeological remains from the excavation permits a broad-based reconstruction of patterns in subsistence and material culture. Changes in these patterns within archaeologically defined components can be successfully correlated with documentary evidence of social and economic change for associated households. A preservation need was thus coupled with a research requirement—the creation of a data base for comparing with other socioeconomic strata and for testing behavioral models. (57)

Benson, Charlotte L. (Washington) **APPLICATIONS OF SERIATION IN COMMUNITY PATTERN ANALYSIS** The utility of seriation in community pattern definition is demonstrated with surface collections from prehistoric Pueblo sites in southeast Utah. Seriation is shown to have particular applications in the explanations of culture change (as well as description of cultural variability) such as colonization, abandonment, population mobility, dispersion, and culture contact. Uses for seriation in community pattern delineation are clearly demonstrated in a culture periphery situation such as the northern Anasazi frontier. Potential contributions of seriation method to community pattern studies, and questions of seriation epistemology are considered. (35)

Berman, Mary Jane (Binghamton) **THE ABANDONMENT PROCESS: A CASE STUDY FROM WEST-CENTRAL NEW MEXICO** The abandonment of the upper Gila drainage during the 12th and 13th centuries has long perplexed archaeologists. Deteriorating climate, invading nomads, disease, famine, lack of adequate agricultural land capable of supporting the population, breakdown of exchange relationships, and inter-pueblo strife have all been suggested as causal factors. This study evaluates the validity of these arguments. An alternate model of abandonment employing settlement, hydrological, edaphic, climatological, burial, floral and faunal information is presented and tested on excavation and survey data from the Apache Creek Valley, west-central New Mexico. (27)

Bernstein, David J. (Rhode Island) **THE CENTRAL AMERICAN CELT: CONSIDERATIONS OF FUNCTIONAL DIVERSITY** This paper examines the functional diversity present in a class of lithic artifacts, ground stone celts, which are commonly found throughout Central America, using as a case study materials from eleven different prehistoric sites in Guanacaste, Costa Rica. Micro-wear features, as well as the observation of large scale formal attributes, are used in the interpretation of function. It is suggested that the celts included in this study, as a class, had at least five separate functions. A number of technical considerations relevant to the study of ground stone tools are discussed. (56)

Berry, K. J. (see Eighmy, J. L.) (11)

Bettinger, Robert L. (New York) **PREHISTORIC TERRITORIALITY IN OWENS VALLEY, EASTERN CALIFORNIA** Although assessments of aboriginal sociopolitical organization figure prominently in both past and current models of man/land relationships in the Great Basin, there is virtually no direct archaeological evidence bearing on this aspect of prehistoric human behavior in the area. Recent research in Owens Valley, eastern California, approaches the problem by analyzing the distribution of Fish Springs obsidian to discover potential prehistoric sociopolitical boundaries. This reveals a distinctive spatial patterning of the obsidian, which suggests the presence of a well defined aboriginal territory in central Owens Valley. The finding is compatible with subsistence-settlement models previously proposed for the locality. (26)

Bintliff, John L. (Bradford) **SETTLEMENT PATTERNS, LAND TENURE AND SOCIAL STRUCTURE: A DIACHRONIC MODEL** Changes over time in settlement behavior and land-use strategies in prehistoric and early historic Greece is linked to parallel socioeconomic developments, in particular to the rise and elaboration of ranking, via known and inferred patterns of land tenure. In situations of population pressure, "achieved" statuses based on landed wealth are converted to "ascribed" formal rank, through such mechanisms as the "client" system and "cargo" redistributive system, typical for recent peasant societies. (12)

Bishop, Ronald L., Garman Harbottle, Edward V. Sayre and Lambertus Van Zelst (Brookhaven National Laboratory) **LOWLAND MAYA CERAMIC SURVEY** Classic Maya polychrome exchange is the focus of a paste compositional investigation employing neutron activation and petrographic examination. Trade is inferred from "compositional centroids" established for sites located throughout the Maya Lowlands. Analyses of clays from the Maya region have shown sufficient compositional variability to make the investigation feasible. The sensitivity of the approach permits discrimination between sites as closely spaced as Tikal and Uaxactun. The data base provides the opportunity to evaluate the covariation between paste characteristics and modes of decorative style, which leads to the formulation of more restricted economic models of ceramic exchange. (56)

Bishop, Ronald L. (see Beaudry, Marilyn P.) (39)

Bixler, Albert G. (UC-Santa Barbara) **SOCIAL EVOLUTION AND ENVIRONMENTAL CHANGE: A CASE STUDY FROM COASTAL CALIFORNIA** The evolution of economic and social complexity in the Santa Barbara Channel area is examined using an ecological perspective that relates social organization, economics, and resource base quality and productivity. Data derived from the analysis of six cemeteries spanning 4000 years of history are used to describe the nature and degree of economic inequality over time. This analysis suggests a number of models of social organization and its relationship to subsistence base that account for the observed patterns in the economic evolution of the area. These models are tested using paleoenvironmental data and general anthropological theory. (50)

Blackman, M. James (Smithsonian) **LONG RANGE AND LOCAL EXCHANGE PATTERNS IN SOUTHERN IRAN** The mechanisms controlling both long range and local exchange are important facets in understanding the development of urban systems in the Middle East. Provenience studies using trace and minor element characterization are one way to obtain information bearing directly on these exchange mechanisms. The chemical analysis, by instrumental neutron activation, of obsidian, ceramics, clay seal impressions, and clay objects from Tal-e Malyan and several other sites provides the basis for examining exchange in these materials during the late fourth through the third millennium B.C. in southern Iran. (7)

Blake, Susan E. (Michigan) **LITHIC RAW MATERIAL VARIATION AND CHANGING SUBSISTENCE IN THE MIMBRES VALLEY, NEW MEXICO** Analysis of surface collections of chipped stone tools from 400 sites in the Mimbres River drainage Southwestern New Mexico is discussed. Inferences are made about the range of functions of specific classes of lithic raw materials. Variation in the proportions of raw materials used is correlated with other aspects of the sites, including time period, site type and environmental location. This patterning is incorporated into a general model of changing subsistence over time in the Mimbres area. Results suggest a gradual shift from hunting and gathering to greater dependence upon agriculture. (17)

Blank-Roper, Laurie (Arizona State) **FUNCTIONAL RELATIONSHIPS OF LARGE AND SMALL SITES IN THE MIDDLE GILA, ARIZONA** Tests and excavation in the Middle Gila River Valley, Arizona, provide data concerning small Hohokam habitations and limited activity areas. Previously unreported canal systems have been identified and subsurface tests were conducted on several canal sections. Site occupations span the Late Pioneer to Classic Periods. The data serve as an excellent compliment to previous work in the large village sites of the area. The focus of this paper is to tie together the temporal and functional aspects of large and small sites. It will then be possible to develop and test models of Hohokam settlement and subsistence systems. (54)

Blaylock, Sandra K. (Arkansas) **THULE BONE TECHNOLOGY IN THE CANADIAN ARCTIC** Few studies are available on bone technology generally, and no such studies have concentrated on Thule culture. In an attempt to fill this gap, research involving an analysis of unidentifiable bone artifacts and debitage from two Thule sites on Somerset Island, N.W.T., and pretreatment and replication experiments were undertaken. The tools used to work bone leave distinctive marks, including those of metal. Iron and copper may have been used more extensively than previously

suggested. It appears that metal use was a necessary prerequisite to Thule bone technology and the two spread simultaneously from Alaska. (24)

Bodner, Connie Cox (Illinois-Urbana) ON THE USES AND ABUSES OF pH IN ARCHAEOLOGY This report will summarize the results of a series of experiments designed to test the utility of soil pH determinants for field archaeology. Also included will be an evaluation of the various purposes for which archaeologists have used pH and a discussion of the available means of determining pH, the factors which affect it, and the interpretation of pH data. (25)

Boice, Nancy, David C. Hurst, Michael McEachern and Roger C. Nance (Alabama-Birmingham) STATISTICAL ANALYSIS IN A CULTURAL RESOURCE MANAGEMENT STUDY AT FORT MCCLELLAN, ALABAMA A survey was conducted in a random sample of square kilometers from the Fort grid. Seven data sets contained attribute descriptions of the 103 sites, and collected artifacts (bifaces, non-bifaces, potsherds, flakes and spalls, historic artifacts). The seventh data set consisted of environmental descriptions of the 153 kilometer squares (including the 43 surveyed). Spatial distributions and artifact environment covariation were studied statistically through linking the data sets in combinations. Multiple regression predicted numbers of sites, bifaces, flakes and spalls, and historic artifacts for nonsurveyed squares based on environmental characteristics recorded for all squares and cultural data from surveyed squares. (62)

Bolognese, Marisa (see Findlow, Frank J.) (26)

Bombin, Miguel (Alberta) PHYTOLITHS AND PAST HUMAN ACTIVITY Phytoliths (plant opals) are produced by a variety of plants and, particularly in monocots, they have distinctive morphological attributes. Associated to other indicators, phytoliths recovered from soils and sediments are proving to be very useful for a more precise reconstruction of past vegetation and related environmental conditions. The record of past human activity can also be enriched by the addition of phytolith data, from extra-site studies (e.g., burning activities), as well as from the interpretation of intra-site spatial distribution of these opal corpuscles. The possibility of identification of cultivated plants through phytolith studies is also critically discussed. (38)

Bonnichsen, Robson (Maine) THE MUNSUNGUN LAKE LITHIC SOURCE REGION A major lithic source region has been discovered in the Munsungun Lake region in north central Maine. Ordovician cherts which occur in the Munsungun Lake formation have been extensively exploited since the end of the ice age. Over eighty sites have been located, including pit mines and workshops. A sequence of terraces occurs at Munsungun Lake that have yielded sites of Ceramic, Archaic, and Paleoindian age. This sequence of sites provides evidence in Maine of sites older than 5,200 years and presents the first opportunity to develop a cultural sequence from an interior lake environmental setting in this region. (43)

Borstel, Christopher L. (Maine-Orono) FLOODPLAIN SITES, THE CHRONOSTRATIGRAPHIC METHOD, AND PERCEPTIONS OF THE PAST The chronostratigraphic method allows archaeologists to place remains into relative chronological order. Due to the formation processes affecting them, many sites in floodplain environments lack the necessary characteristics for the successful application of the method. By examination of several Northeastern sites, this paper will explore the implications of site structure for the ways in which the past is perceived and knowledge of prehistory created. (5)

Bowen, Jonathan E. (Ohio Historical Society) MILLER'S RIDGE: A FT. MEIGS UPPER MISSISSIPPIAN VILLAGE IN NORTHERN OHIO. A village site of the Ft. Meigs culture is located on Miller's Ridge south of Sandusky Bay of Lake Erie. The results of an extensive, controlled surface collection make it possible to identify intravillage activity areas, the margins of the settlement, and activity areas outside the village. Ceramics, lithics, bone tools, human bone, and floral and faunal remains are represented in the collection. The especially good series of lithic material recovered permits a clearer definition of this industry for the Ft. Meigs Upper Mississippians. (23)

Bowen, Thomas (California State-Fresno) IN SEARCH OF THE SAN ESTEBAN ISLAND SERI Over the past two decades several papers on the Seri Indians of Sonora, Mexico, have indicated that a dialectically and culturally distinct Seri population formerly inhabited San Esteban Island. Although they purportedly became extinct about a century ago, the history and culture of these people have been preserved in traditions of the modern Seri. The San Esteban Islanders appear, however, to have gone unmentioned by the historic European observers. In order to test the veracity of the Seri traditions, an archaeological survey on San Esteban Island was undertaken; results are reported. (53)

Bradley, James, Thomas E. Mahlstedt and Francis P. McManamon (National Park Service) A NATIVE AMERICAN OSSUARY ON CAPE COD, MASSACHUSETTS A prehistoric ossuary, discovered during a construction project on Indian Neck in Wellfleet, Massachusetts, is dated to the Late Woodland period (900-c. 1600 A.D.). The areas contained a late prehistoric or contact period midden above the ossuary. The midden was stratigraphically separate from the burial levels. The first level of the burial feature can best be termed an ossuary. Roughly oval in shape with the long axis north-south, this level contained the disarticulated remains of at least two dozen individuals. The second level of this feature, a cremation, was a small, somewhat irregular, but densely packed layer of calcined bone. The Indian Neck Ossuary represents the only known burial of its type in New England. The best-known example of mass secondary interments is the "Feast of the Dead" ceremony and subsequent ossuary burial of some Iroquoian- and Algonquian-speaking groups in the Great Lakes area. (33)

Bradley, Richard (Reading) PRESTIGE TRADE, AGRICULTURE AND SOCIAL CHANGE—SOME EUROPEAN EXAMPLES The consequences of the collapse of ranked societies in different parts of Europe and the relationship between the intensity of prestige trade and that of agricultural production are considered. These represent alternative social investments and are connected with distinctively different social formations, one relatively ranked and the other relatively egalitarian. This contrast extends to settlements, cemeteries, ceremonial sites and the landscape. Agricultural intensification in turn creates the basis for the renewed development of ranking. This model will be illustrated by examples from the Bronze and Iron Ages of Britain, Bohemia and Sweden. (1)

Braun, David P. (Southern Illinois-Carbondale) NEOLITHIC REGIONAL COOPERATION, A MIDWESTERN EXAMPLE Local social autonomy often is an assumed concomitant of sedentism and early food production; with competition and productive intensification assumed to be normal responses to subsequent population/resource disequilibrium. Ecological and organizational theoretical arguments, however, lead to an expectation that supralocal cooperation was instead the more-often effective response to the developing economic conditions. The Middle-Late Woodland transition in the central midwestern U.S. is proposed as an example of this latter process. Issues in using exchange goods and domestic ceramic styles to analyze intralocality social distance are discussed, along with the analytical methods and results and their broader implications. (58)

Braun, David P. (see Synenki, Alan T.) (58)

Breternitz, Cory (see Lipe, William) (31)

Breternitz, D. A. (Colorado), Bye, R. A. (Colorado), James, S. E. (Woodward Clyde), Kane, A. E. (Colorado), Knudson, R. (Idaho) RESEARCH DESIGN AND OPERATIONS MANAGEMENT The research design is formulated to consider five major problem domains: (1) economy and adaptation; (2) paleodemography; (3) Settlement patterning and social organization; (4) extraregional relationships (trade); (5) culture processes. All materials analyzed, data from all consultants' investigations, and pertinent available information from other projects which can be incorporated into a regional overview are being put into the project computer system for storage, manipulation and retrieval. Responsibility for second and third level analysis is formulated by individual task specialists and supervisory personnel to answer pertinent questions posed by the problem domains. (31)

Bricker, Harvey M. (Tulane) THE USES OF THE PAST: NEOLITHIC REWORKING OF PALEOLITHIC FLINT ARTIFACTS The site of Les Tambourets, in the French Pyrenees, had two major prehistoric occupations, Upper Paleolithic and Neolithic. By the Neolithic, the Paleolithic archaeological level and presumably, many of its flint artifacts, had been extensively exposed by erosion. Many of these patinated objects were reworked into retouched tools, but their age or cultural affiliation is not apparent from classical typological diagnosis. Evidence from a multivariate cluster analysis shows that Neolithic artificers used the Paleolithic habitation site as a flint "quarry" instead of importing Pyrenean flint from other sources. (14)

Bridges, Sarah T. (U.S. Fish and Wildlife Service) HISTORICAL AND ARCHAEOLOGICAL RESOURCE MANAGEMENT IN THE FISH AND WILDLIFE SERVICE Historic and archaeological resource management is currently being integrated into the Master Planning process for the various units of the National Wildlife Refuge System. The Master Planning process is seen as a means to achieve some very practical and necessary land-management ends. In addition, it can be used to achieve informed resource management decisions that are responsive to the research needs of the region. (44)

Bronitsky, Gordon (Texas-Permian Basin) RELIGION IN WEST TEXAS: A MODERN MATERIAL CULTURE FIELD SCHOOL One recent trend in archaeology has been its redefinition as the study of human behavior through material culture, regardless of the particular temporal setting. Along with this has come the realization that archaeological sites are a vanishing resource, a realization that has promoted the growth of a conservation ethic in archeology. To incorporate these trends into teaching and research, a modern material culture field school was conducted to introduce students to archaeology as a way of seeing the world, to teach some of the basic skills and principles while focusing on the decisions involved in their use, and to create an awareness of the potentials of modern material culture for the study of religion. (13)

Brooks, Richard H. and Sheilaigh T. Brooks (Nevada-Las Vegas) A GAME PEOPLE PLAYED: THE DISTRIBUTION OF JUGAR A CUATRO IN NORTHWEST MEXICO The game *jugar a cuatro* was described first by Lumholtz (1903) in northwestern Mexico, but its origins have been problematical; was it introduced historically by the Spanish, or do archaeological data substantiate a pre-Spanish origin? One hypothesis on the game's prehistoric occurrence is that it may have been introduced by the more complex Chalchihuites of Loma San Gabriel cultures into simpler cultures of Chihuahua and Durango, thereby spreading north and eastward along the Sierra Madre Occidental. Archaeological survey evidence is presented that extends the ethnographically known boundaries of the game outside of the Sierra Madres. Prospects are discussed that excavation might extend the game's distribution into a broader prehispanic context. (53)

Brooks, Sheilaigh T. (see Brooks, Richard H.) (53)

Brose, David S. (Cleveland Museum of Natural History) SPECIAL-PURPOSE FORT ANCIENT SITES IN SOUTHERN OHIO Excavations in the Caesar's Creek and Brush Creek drainage area, while providing data on Fort Ancient economy, also demonstrate a technological and stylistic transition from local late Woodland complexes to Fort Ancient, thereby supporting models which derive Fort Ancient out of local antecedents. Other sites in the Caesar's Creek area date to a post-A.D. 1400 period and are demonstrably contemporaneous with Madisonville phase sites to the south. The Brush Creek excavations at the Killen-Grimes complex reveal evidence for a series of special-purpose activity areas relating to the 400-meter distant Wamsley site. Activities represented include butchering, hide working, lithic reduction, pottery manufacture (?), and ceremonial or mortuary treatment. These non-nucleated activities end at a low burial mound located on the edge of the occupied terrace. The 33 burials from this mound lack evidence for high status treatment. (40)

Brown, Joe, and David T. Clark (Smithsonian) A PRELIMINARY REPORT ON THE FAUNAL ASSEMBLAGE FROM RUSSELL CAVE: 1956-1958 EXCAVATIONS Russell Cave (1JA181) is a deeply stratified, multicomponent site in Jackson County, northeast Alabama. The site was occupied, by human groups, for at least 9000 years. The faunal assemblage, currently under analysis, was recovered during excavations conducted at the site between 1956 and 1958. Since that time the assemblage has been housed at the Department of Anthropology, National Museum of Natural History, Smithsonian Institution. The preliminary results of the faunal analysis have yielded important information regarding the subsistence practices and modified bone technology employed by the inhabitants of the site. (55)

Brown, Marley R. (Interagency Archeological Services-S.F.) David Frederickson and Daniel Larson (Sonoma State-Rohnert Park) CULTURAL RESOURCES AND GEOTHERMAL DEVELOPMENT AT THE GEYSERS, CALIFORNIA During the past six years, cultural resource management within the Geysers Known Geothermal Resource Area in northern California had moved from a piecemeal approach producing more than 100 cultural resource studies, to one coordinating the cultural resource activities of governmental agencies, archaeological consultants and the academic sector. This effort allows more effective advance planning and protection of the cultural resources threatened by energy-related development. (44)

Bruhns, Karen O. (San Francisco State) CERAMICS, ETHNICITY AND TRADE: A DIACHRONIC VIEW OF THE SOUTHERN FRONTIER Preliminary analyses of artifact assemblages from a number of sites in El Salvador suggest very strongly a participation in several distinct spheres of trade and influence during the prehispanic era. These diverse connections have at least twice led to increased experimentation in ceramics and the spread of these new techniques to the north and west. Although certain ethnic affiliations are hinted at, it is evident that we are dealing with a situation of repeated movements of peoples and of changing trade routes due to political and social events in both Mesoamerica and lower Central America. Models developed in Western Asia in similar situations may prove of value in dealing with these Salvadoran data. (59)

Brumbach, Hetty Jo (Wake Forest) and Robert Jarvenpa (SUNY-Albany) THE ECOLOGICAL

HISTORY OF ETHNIC ADAPTATIONS IN CENTRAL AND SUBARCTIC CANADA The process through which four different ethnic groups—Chipewyan, Cree, Metis, and EuroCanadian—resident in northwestern Saskatchewan, adapted to the natural environment, the EuroCanadian oriented fur trade, and to other competing/cooperating social groups since the late 18th century is discussed. Information is drawn from several sources, including participant and ethno-archaeological observation conducted among ongoing communities and archaeological field survey of recently abandoned sites. A picture of the ecological process of intertribal and inter-ethnic communication, symbiosis, enmity, and identity management is synthesized. Fur trade specialization is seen as causally linked to these patterns of intergroup relationships. (61)

Brunson, Judy L. (Interagency Archeological Services-WASO/Arizona State) ENERGIZING ARCHAEOLOGY Today's apparent pressing needs for new and better energy resources have created a situation which can be viewed as potentially dangerous for archaeology. With the emphasis on providing new energy resources at a faster pace, archaeology cannot afford to be referred to as the responsible agent in slowing projects. The adaptability of our profession to the needs of the "real world" is of paramount importance. Two strategies, predictive planning and a specific ethical code, are discussed as possible answers to integrating archeology with other national concerns. (44)

Buckles, William G. (Southern Colorado) RELATIONSHIPS OF THE COLORADO MINING FRONTIER AND A PLAINS CULTURAL PATTERN The Plains pattern of nineteenth-century Colorado was systemically related to the mining frontier. Initially, mining and related activities had primacy over other uses of water, timber, energy and other resources and focus points for development of Plains patterns. Mining dominance was superseded by maturity of regional patterns related to national and other relationships. Initial mining is relevant in understanding relationships, cultural-ecological adaptation and other cultural processes in the two areas and our society. These processes relate to contemporary patterns, conservation, social welfare, and other phenomena difficult to explain as isolated phenomena. (4)

Buikstra, Jane E. and Mark Swegle (Northwestern) NEW EXPERIMENTAL EVIDENCE CONCERNING THE IMPACT OF BURNING UPON BONE Interpretation of cremated human bone frequently involves reconstruction of such variables as pre-incineration body condition and relationship of body to heat source. Though experiments designed to establish standards for such interpretation have been conducted, there continue to be conflicting arguments concerning the degree to which bone shrinks and warps during incineration and expected pattern of surficial changes in bone burned "green" and that burned dry. This paper presents new data derived from experiments conducted with human and nonhuman bone. The newly reported work systematically investigates the relationship of heat source and pre-incineration bone conditions to patterns of warpage, shrinkage, and color change. (5)

Buikstra, Jane E. (see Charles, Douglas K.) (23)

Butler, Brian (see Merritt, James) (5)

Butler, Robert F. (see Sternberg, Robert S.) (11)

Butler, Robert F. (see McGuire, Randall H.) (11)

Butler, William B. (Interagency Archeological Services-Denver) and Charles M. Niquette (Interagency Archeological Services-Denver/Arkansas) IN CONSIDERATION OF ARCHAEOLOGISTS SERVING INDUSTRY, CULTURAL RESOURCES AND THE PROFESSION Energy self-sufficiency has become a national priority and forthcoming energy development will be a major catalyst in transforming the way we engage in contractual archaeological activities. Failure to efficiently serve the energy industry may result in the cultural resource laws being changed or overridden. Problems that hinder such efficiency include: (1) time; (2) lack of qualified archaeologists; (3) federal, state and local bureaucratic ineptitude; (4) lack of field and report standards; (5) absence of adequate peer review, and (6) the "granting of clearance" by unenlightened archaeologists. A solution to these problems focuses on the critical need for performance standards that can be agreed upon and adhered to by all who are involved in such archeological undertakings. (44)

Bye, R. A. (see Breternitz, D. A.) (31)

Cantley, Charles E. (see Novick, Andrea L.) (23)

Cantwell, Anne-Marie (Rutgers-Newark) PREHISTORIC DOG BURIALS IN EASTERN NORTH AMERICA This paper addresses itself to a particular aspect of the classic problem of the ritual at-

titude of man to animals. The relationship between prehistoric Amerindians and *Canis familiaris* in Eastern North America is here examined by analyzing dog burials, both those of animals buried alone as well as those accompanying human burials. Several distinctive regional and temporal patterns of dog mortuary ceremonialism are identified. These are related to differences in the symbolic and economic systems of the associated prehistoric human populations. (63)

Carbone, Victor A. (Interagency Archaeological Service-Atlanta) PHYTOLITH RESEARCH IN THE SHENANDOAH VALLEY, VIRGINIA This paper deals with a number of research projects which were undertaken in conjunction with the Middle Shenandoah Valley Early Man Project. The projects were designed to evaluate: (1) the different phytolith recovery techniques; (2) the usefulness of phytoliths as paleoecological indicators; (3) the usefulness of phytoliths as stratigraphic markers; and (4) the relationship between phytolith profiles and other pedological characteristics. The results indicate that the analysis of phytoliths is perhaps one of the most potent tools in archeological research. (3)

Carothers, Joan (see Carter, Elizabeth) (7)

Carr, Christopher (Arkansas) THE CHEMISTRY OF ARCHAEOLOGICAL SOILS FROM AN ECOSYSTEMIC, TEMPORAL PERSPECTIVE Chemical anomalies in the soils of archaeological sites are useful in reconstructing the kinds and locations of activities. To interpret such anomalies with respect to the refuse materials which produced them, the age of the anomalies and their patterns and degree of modification over time by natural nutrient cycling processes must be considered. Factors responsible for anomaly modification are described. Methods are outlined for estimating the degree to which and the rates at which anomalies have been modified. (38)

Carskadden, Jeff MIDDLE FORT ANCIENT SETTLEMENT PATTERNS AND CULTURAL RELATIONSHIPS IN THE MUSKINGUM VALLEY OF EASTERN OHIO Most known information about Fort Ancient in eastern Ohio comes from excavations conducted during the past five years at the Philo II and Richards Sites. These sites are located in the Muskingum River valley, an archaeologically unknown area at the time of Griffin's formulation of the Fort Ancient Aspect (1937, 1943). Muskingum Valley Fort Ancient is significant not only because it presents entirely new data for the study of Fort Ancient, but because it is the easternmost extension of Fort Ancient north of the Ohio River. (40)

Carter, Elizabeth and Joan Carothers (UCLA) THE MIDDLE ELAMITE OCCUPATION AT MALYAN Excavations on the summit (the EDD operation) of Malyan mound have uncovered domestic, industrial and public installations of the Middle Elamite Period (ca. 1300-1100 B.C.). Results of several types of ceramic and artifact analysis of the variability within the EDD assemblage are presented. Integration of the architectural, artifactual and written records from Malyan provides new information on the role of highland Elam in the formation, administration and dissolution of the Elamite Empire. (7)

Cartwright, Juliette (Texas-Austin) EARLY FORMATIVE BUILDINGS AT CUELLO The millennium of Early Formative occupation at Cuello (2000-1000 B.C.) has left a sequence of architectural remains consisting of low plaster-covered platforms with earth and stone fill and often stone retaining walls. The platforms range in size and plan from small circular structures 2 meters in diameter to large oval structures at least 6 by 8 meters. Most platforms have patterns of post holes indicating the nature and size of their perishable superstructures. (32)

Catlin, Mark A. (Virginia) THE PRIMARY-SECONDARY SITE AGGREGATE AS AN ENVIRONMENTAL AND SOCIAL ADAPTIVE MECHANISM ON BLACK MESA, ARIZONA: ITS STATISTICAL AND SUBSTANTIVE SIGNIFICANCE It has been argued that populations from the last phase of occupation, in Northeastern Black Mesa, established a specific kind of social organizational mechanism in order to adapt to the agricultural requirements of marginal upland areas. This mechanism was the establishment of primary-secondary site aggregates. The present study retests, using statistical tests of significance, the original analysis. Also, settlement distributions from earlier periods than the one that the original analysis considered are statistically analyzed. Finally, an attempt is made to test an alternative hypothesis suggested for the social function of sites with similar components to the primary site type. The implications of this hypothesis to the hypothesized adaptive mechanism of the primary-secondary site aggregate are considered. (54)

Champion, Sara (Southampton) EXCHANGE AND RANKING: THE CASE OF CORAL The appearance of Mediterranean coral in graves of the earlier Iron Age (700-250 BC) of Central and Western Europe is of use in defining levels of ranking below the highest and in isolating groups of craft products emanating from specialized, patronized workshops, thus assisting in the recognition of both internal and external exchange patterns. The continued appearance of coral after the

cessation of other prestige imports from the Mediterranean world enables the identification of an alteration in exchange mechanisms resulting from, or in transformation in, social organization and changed economic and industrial processes. (1)

Champion, Timothy C. (Southampton) FORTIFICATION, RANKING AND SUBSISTENCE The correlation of social ranking with the construction of fortifications and variations in subsistence strategy is considered, with special reference to Central Europe 1500-500 B.C. Evidence for ranking is shown to vary through time, but to covary with pressure on subsistence resources. It is suggested that subsistence demands were met variously by agricultural innovation and expansion; both strategies demanded increased organizational control. Increased competition also led to aggression, evidenced by fortification, new weapon types and greater ritual emphasis on weapons. These manifestations of ranking show a remarkable similarity throughout Central Europe. (12)

Chang, Claudia and Terry McCabe (SUNY-Binghamton) ETHNOGRAPHY FOR THE COMPLETE ARCHAEOLOGIST Much of the increased interest in ethnographic fieldwork for archaeologists has arisen out of their growing concern in such areas as: (1) cultural ecology, (2) explanations of behavioral systems, and (3) the role of experimentation in archaeology. This paper will explore positively and pragmatically what ethnographic research has to offer archaeology with respect to these areas of interest. We will also outline three areas that raise specific analytical problems inherent to crossing the disciplinary lines of ethnography and archaeology. These specific concerns are: (1) scale and size of analytical units, (2) types of data collecting methods, and (3) the use of data collected from informants. We also will examine how ethnography conducted by archaeologists contributes to the broader interests of social anthropologists, who usually seek explanations of a less materialist nature. (61)

Chang, Claudia (see Murray, Priscilla) (61)

Chapman, Robert W. (Reading) AUTONOMY, RANKING AND RESOURCES IN IBERIAN PREHISTORY The autonomous development of social ranking in Iberia ca. 3000/2500-700 B.C. is discussed. The archaeological correlates of ranked societies are examined in this context. Emphasis is placed upon the different critical resources upon which apparently comparable social developments were based in two areas. The general problem of using archaeological evidence to detect the emergence of ranking is discussed. (1)

Charles, Douglas K., Tillman Farley, Steven R. Leigh and Jane E. Buikstra, (Foundation for Illinois Archaeology) GEOMORPHOLOGY AT THE ELIZABETH MOUND GROUP IN WESTCENTRAL ILLINOIS In archaeological investigations, active collaboration of geomorphologists with archaeologists is essential. Archaeologists, familiar with the appearance of redeposited or altered soils containing cultural materials, require input from soil scientists to fully define the sequence of natural and cultural processes which led site development. Such collaboration at Elizabeth Mounds, has resulted in identification and limit definition of an Archaic mound formed from unstructured loess over natural soils of the same material. Soil tests on samples from inside and outside the mound demonstrated that the cemetery involved major landscape modification and moundbuilding. (23)

Chartkoff, Joseph L. (Michigan) THE PETRIOLO II PROJECT This paper reports on progress in the three-year project at the Paleolithic open-air station of Petriolo II located in southern interior Siena Province, Tuscany, Italy. Conducted by the Department of Anthropology at Michigan State University and the Fondazione Etrusca di Spannocchia, Italy, the project has completed a 100% stratified surface collection and a 1% stratified random sample test excavation program. Current progress on understanding the site's stratigraphy, spatial organization, technology and function will be discussed, along with its apparent place in the Italian Paleolithic. (30)

Chase, Arlen F. (Pennsylvania) INTRUSIVE ELEMENTS IN THE ARCHAEOLOGY OF NOHMUL AND SANTA RITA Excavations at both Nohmul and Santa Rita have unearthed evidence for "intrusive influences" in northern Belize during the terminal Classic and Postclassic periods. These influences are of a different nature and order of magnitude at each site for their respective time periods. Both sites, however, exhibit ties to northern Yucatan. At Santa Rita, these links are quite subtle while those at Nohmul are more pronounced. For Terminal Classic Nohmul, this northern link is felt to be a result of a direct Yucatec intrusion. The northern link to Late Postclassic Santa Rita most likely results from the site's position as the regional capital of the area. (52)

Chase, Arlen F. (see Coffman, Robert J.) (52)

Chase, Diane Z. (Pennsylvania) THE COROZAL POSTCLASSIC PROJECT—AN OVERVIEW The



Corozal Postclassic Project represents a scientific attempt to answer continuing questions concerning chronological and spatial problems of the Maya Postclassic period. In the course of excavation at the site of Nohmul (1978, 1979) and Santa Rita (1979), much data has been gained towards answering these Postclassic questions; other, earlier, problems have also been raised. The preliminary results of these Corozal Postclassic Project excavations are presented; in short, these results bear on the duration and nature of the Maya Postclassic period as well as the definition of a "site" in Mesoamerica. (52)

Chase, Diane Z. (see Hartman, Nicholas) (52)

Cheek, Charles D. (Archeological Research Associates) THE DEVELOPMENTAL SEQUENCE AT THE MAIN GROUP, COPAN Recent work at the southeastern Mayan site of Copan indicates that there were several pulses of architectural activity in the main group. The developmental sequence of the Main Group is outlined and compared to other sequences at Mayan sites. The relationship of architectural activity to the known rulers of Copan is also discussed. (28)

Classen-MacClelland, Cheryl P. (Harvard) ARTIFACT ANALYSIS AND BEHAVIORAL INFERENCE: REUSED ARTIFACTS Observation and analysis of reused objects can yield information on both the economic and social subsystems of a group in ways both unique and similar to other kinds of data. The typologies discussed overcome the usual problems of failure to accommodate multiply or sequentially used objects. Several reuse patterns emerge. It is also possible to estimate the kinds and amounts of temporal and spatial displacement these artifacts have undergone, knowledge required for further data manipulation. (14)

Clabeaux, Marie S. (Buffalo State) HUMAN SKELETAL REMAINS FROM THE ABBOTT FARM SITE Thirty-nine individuals, including two children, are available for study from the eighty which were discovered at the site. Analysis is limited by the fragmentary nature of the material. The profile emerging from skeletal examination includes: adult mortality rates which parallel those found in other pre-Columbian American Indian populations; morphological variation in the skull such as occipital bunning, sagittal keel, and cranial flattening; minimal occurrence of pathologies and trauma, with the exception of dental pathology and the frequent occurrence of anomalies. Metric analysis can be done on only a few of the remains. (48)

Claplanhoo, Edward E. (Makah Tribe, Neah Bay, Wash.) A MAKAH WALKING THROUGH THE PAST A former chairman of the Makah Tribe of the Pacific Northwest discusses the meaning and impact for this people of the tribal archaeological program and museum. These recent projects have clarified tribal history and traditional culture, heightened cultural awareness and pride, assisted in economic development, and contributed in other significant ways to the lives of Makah people today. (45)

Clark, David T. (Smithsonian Institution) SUBSISTENCE AND SETTLEMENT AT PYRAMID LAKE, NEVADA One Owl House and Three Moon's Eagle represent two stratified, multicomponent, open habitation sites located at the confluence of the Truckee River and Pyramid Lake, Washoe County, Nevada. The present evidence indicates that the subsistence-settlement pattern practiced by the inhabitants of the sites was based on the seasonal exploitation of the lowland biotic communities of the Lower Truckee River/Pyramid Lake region. The subsistence pattern was based, primarily, on the exploitation of fish from the ancient and unique fishery formed by the Truckee River and Pyramid Lake. At these sites fishing was supplemented by plant collecting and the hunting of small game. Each site functioned as a specialized food processing and manufacturing locality. The research conducted at these sites represents the first detailed study of open habitation sites in the lower Truckee River/Pyramid Lake region. (20)

Clark, David T. (see Brown, Joe) (55)

Clark, George R., II (Kansas State) MOLLUSCAN GROWTH LINES: THEORY, TECHNIQUES, AND POTENTIAL APPLICATIONS IN ARCHAEOLOGY Molluscan shell growth is very sensitive to environmental conditions, and seasonal variations in environment are commonly reflected in the accreting shell as growth lines. Archaeological interpretation of growth line records is a demanding process, and dependable results may require examination of thin sections by polarizing microscopy, comparison with growth line records of local living populations, and random checks on seasonal increments by oxygen isotope paleothermometry. Under ideal conditions, interpretations may include not only the season of harvest but the total size of the harvest and the number of successive years in which harvests were made. (5)

Clark, John E. (New World Archaeological Foundation) AN APPROACH TO THE STUDY OF CHIPPED STONE TOOL FUNCTION IN MESOAMERICA: A PROGRAM FOR CHIPAS, MEXICO

Determining tool use, or the utility of doing so, can be particularly vexing in Mesoamerica because the complexity of the sites and the past cultural systems affected tool manufacture, use and deposition. One approach to these problems, that has been employed for sites in Chiapas, is discussed. Function is largely determined through a macroscopic identification of experimentally produced microchipping patterns. Results are summarized of such analysis of obsidian artifacts from the large Preclassic site of La Livertad, Chiapas. (17)

Cleere, Henry F. (Council for British Archaeology) ARCHAEOLOGY AND THE PUBLIC IN BRITAIN The tradition of amateur involvement in archaeology in Britain is an old one. The history of the relationship between the British people and the remains of their past is interpreted in terms of the changing patterns of British society. Since World War II attempts have been made to integrate the various facets of antiquarianism and the conservation movement, but paradoxically the greater availability of government funds has tended to increase polarization rather than integration. The present situation is an unstable one, resulting in an unfortunate dispersal of enthusiasts and funds, and public interest in archaeology is thereby in danger of being eroded. (22)

Coffman, Robert J. and Arlen F. Chase (Pennsylvania) THE SEARCH FOR HOLPATIN: HISTORIC EXCAVATIONS IN ORANGE WALK THE 1978 Corozal Project carried out several excavations in the modern town of Orange Walk, Belize. The object of these excavations was to examine whether or not Orange Walk could have been the historically known town of Holpatin. The results of the excavations done in 1978 are reported here. Although Postclassic material had been previously noted, the investigations do not indicate that a large population existed in the areas tested within Orange Walk in the 17th century. Doubt is therefore cast on Holpatin being located within the limits of present-day Orange Walk. (52)

Collins, M. B. and Boyce N. Driskell (Kentucky) CHANGING VALLEY GEOMORPHOLOGY AND SETTLEMENT PATTERNS, 8000 B.C. TO A.D. 1900, FALLS OF THE OHIO AREA Geomorphic and archaeological data in the constricted Ohio Valley below the Falls reveal the following sequence: Early and Middle Archaic—small sites on active riverside bars; Late Archaic—the same plus large sites on floodplain ridges; Early Woodland—small sites on floodplain ridges; Middle Woodland and Mississippian—no habitation sites. The river reworked glacial outwash detritus and deposited overlying finer sediments in bars until 1000 B.C. when a mature, forested, locally swampy, clayey floodplain was established. It is suggested that these conditions discouraged settlement by agriculturalists until late nineteenth-century population pressure made clearing and draining feasible.

Collins, Susan, John Gifford, George Rapp Jr. and Margaret Thomson (Minnesota) PHYTOLITH SYSTEMATICS Phytoliths hold some potential, in a manner roughly analogous to pollen, to provide evidence for the paleoecology of an archaeological site catchment area as well as for the intensive use of specific flora at a site. We have modified the phytolith classification of Twiss, Suess, and Smith (1969) into a purely empirical taxonomy based only on gross morphology. We have found both diagnostic individual phytolith shapes and characteristic phytolith assemblages in roots, stems, leaves, and inflorescences. (3)

Collis, John (Sheffield) GRADUAL GROWTH AND SUDDEN CHANGE: URBAN SETTLEMENTS IN TEMPERATE EUROPE IN THE LATE IRON AGE In the last two to three centuries B.C., settlements of considerably greater size and complexity than anything previously known appeared in temperate Europe, sites that justify the adjective "urban." Though in some cases we can identify sites that gradually expand from small village settlements, the majority are newly founded defended "oppida" that represent a sudden nucleation of the population. (12)

Conner, Michael D. (Chicago) GENETIC APPROACHES TO PREHISTORIC SOCIAL ORGANIZATION Aspects of human social organization often influence the genetic structure of populations. Studies of living populations have shown the importance of social factors (e.g., lineage structure, mating and residence systems) in determining patterns of genetic diversity within a regional population. This paper examines the feasibility of using biological data from skeletal remains to interpret prehistoric social processes. The method employed involves biological, statistical and archaeological constraints; under the proper circumstances it can offer important insights into past societies. As an example, completed and planned research on Woodland burial mounds in the lower Illinois River valley are reviewed. (58)

Cooke, Richard G. (see Ranere, Anthony J.) (15)

Cosans, Betty J. (John Milner Associates) CULTURAL INTERPRETATION OF PRIVY FILLS IN THREE NINETEENTH CENTURY PHILADELPHIA NEIGHBORS Considerable archaeological research in Philadelphia has centered upon seventeenth- and eighteenth-century occupations

within the colonial boundaries of the city. Although later nineteenth-century occupations are often in evidence, the full range of nineteenth century behavior has not been adequately addressed by the analyses of third and fourth generation occupational debris in colonial parts of the city. This paper attempts to partially resolve this problem by presenting a comparative analysis of privy fills from two contemporaneous neighborhoods dating to ca. 1810-1830 and intrusive early nineteenth century privy fills from a neighborhood initially developed in the early eighteenth century. Among the factors to be addressed are observable differences in lifestyle and differences in sanitation practices and attitudes. (49)

Coughlin, E. A. and Ericson, J. E. (Harvard) BIOGEOCHEMICAL RESIDUES AS ETHNOBOTANICAL INDICATORS Plant utilization on occupation sites may result in biogeochemical residues in the soil. It does appear that certain plants accumulate or are deficient in particular suites of elements. This biogeochemical partitioning of elements provides a means of identifying the residues of particular plants or plant categories. A survey technique is proposed which efficiently identifies these residues as anomalies in the soil of the site. This biogeochemical patterning and technique can be applied in site surveying, locating specific activity areas on-site and detecting reasons for dietary and nutritional pathologies in the skeletal remains of the inhabitants. (38)

Crabtree, Pam Jean (Pennsylvania) ANIMAL USE AND CULTURAL CHANGE West Stew, the only completely excavated Anglo-Saxon site in Britain, is a rural settlement site dating from the 5th to 7th centuries A.D. Four Anglo-Saxon occupation phases can be discerned. Excavations produced a vast quantity of animal bone remains. The abundance and excellent state of preservation of these bones make meaningful quantitative faunal analysis possible. Traditional analyses of archaeological animal bone assemblages have emphasized the reconstruction of prehistoric economic and subsistence systems. In contrast, the analysis of the West Stew faunal material was designed to detect both conventional economic information and noneconomic cultural information which may also be obtained through faunal analysis. (55)

Creamer, Winifred (Tulane) EVIDENCE FOR PREHISPANIC EXCHANGE SYSTEMS IN THE GULF OF NICOYA, COSTA RICA Sixteenth-century explorers of the Pacific coast stopped in the Gulf of Nicoya, landing at several islands reporting water travel and trade. The hypothesis that the islands were exchange centers is examined. Archaeological survey of seven islands indicates that there was extensive prehispanic occupation of the region, while ceramics collected show increase in variability of types from the Middle (A.D. 500-1200) to the Late Polychrome (A.D. 1200-1500) period. This suggests that contacts with areas outside the Nicoya region were increasing. Impetus for exchange may have been population pressure or lack of durable resources; exchange in turn may have stimulated changes in social organization. (2)

Cremin, William M. (Western Michigan) THE SCHWERDT SITE: A FIFTEENTH-CENTURY FISHING STATION ON THE LOWER KALAMAZOO RIVER, SOUTHWEST MICHIGAN Schwerdt is a single component site of Upper Mississippian affiliation. Excavations conducted over two field seasons have resulted in the recovery of data identifying the site as the location from which spring-spawning sturgeon were harvested over a period of years. Those attributes that appear to distinguish this settlement type are presented, together with some ideas about Upper Mississippian subsistence-settlement behavior in that region bordering the head of Lake Michigan. (23)

Cressey, Pamela J. (Alexandria Archaeological Research Center) SHARING THE IVORY TOWER Incorporating an archaeological research facility into a city governmental structure requires the creation of an overall research strategy integrative mechanisms with other city agencies, preservation objectives, as well as avenues for community interpretation and participation. The development, administration, and funding of the research, management, interpretation, and education components of the Alexandria Archaeological Research Center (AARC) are outlined and the relationship of AARC to the community is discussed. The conjectural conflict between scholarship and public interest is explored at both the theoretical and substantive levels. (57)

Crown, Patricia L. (Arizona) UNDERSTANDING VARIABILITY IN THE UTILITY WARES IN THE UPPER LITTLE COLORADO REGION The variability in the brown and gray corrugated wares in the Upper Little Colorado Region of Arizona during the 12th and 13th centuries is examined. Both temporal and spatial variability are considered, and special reference is made to the assemblages obtained from recent excavations at two small pueblos near St. Johns, Arizona. Technological, functional, and stylistic variability are analyzed within and between the wares from these assemblages. Possible explanations for the disparate frequencies in wares from site to site over the region are reviewed. (54)

Custer, Jay F. (Delaware) A COMPARISON OF BLUE RIDGE AND GREAT VALLEY SETTLEMENT/SUBSISTENCE SYSTEMS Locational data from the Blue Ridge (New River drainage) and

the Great Valley (Middle River drainage) in Virginia indicate that correlations of site locations and edaphic factors are similar in both areas. Specific environments do differ between areas with Blue Ridge environmental resources tightly packed in small units and Great Valley resources in large units less tightly packed. Consequently, Blue Ridge settlement patterns indicate more seasonal fragmentation and with Woodland population growth new communities appear. Great Valley settlement patterns differ with fewer indications of seasonal fragmentation during the Archaic and increased size of individual sites with Woodland population growth. (33)

Daddario, Joanne T. (Arizona State) AN EXCHANGE AND INTERACTION NETWORK ON THE COLORADO PLATEAU Recent excavations conducted at the site of Chavez Pass, Arizona, have indicated the presence of large quantities of trade items from a wide geographical area. Such nonlocal materials (e.g., ceramics, turquoise and shell) occur throughout the archaeological sequence at the site. The relative frequencies of exotic items imported from distinct geographical areas varies through time, indicating possible changes in the organization of the interaction network. This paper attempts to identify these changes and to outline a diachronic model of exchange. (54)

Daniels, R. B. (see Holzhey, C. S.) (38)

Davenport, Michael (Rutgers) and Carl Beetz (Pennsylvania) STRUCTURE 35 AND OTHER LATE FORMATIVE BUILDINGS AT CUELLO The Early and Middle Formative levels at Cuello are concealed and preserved by the massive Late Formative Platform 34 and its superincumbent pyramid Structure 35. During the excavation of the earlier deposits it proved necessary to remove with equal care large areas of Late Formative structures and caches. Structure 35 especially, proved to be a building of interest, dating from the end of the Late Formative and with a number of idiosyncratic architectural features including rear terracing and painted stair risers. This pyramid and associated domestic and ceremonial buildings are described and their architectural relationships evaluated. (32)

Davidson, Donald A. (Strathclyde, U. K.) SOILS AND ARCHAEOLOGICAL SITE DISTRIBUTION This paper begins by reviewing the problem associated with determining if soil characteristics influenced former communities in the selection of their sites. Attention is focused on problems associated with determining significant soil properties. A simulation approach to site distribution analysis as well as an ecological approach are compared with reference to Megalithic sites in Scotland. The paper calls for a more integrated approach to research on soils and archaeology and demonstrates that recent methodological advances in applied soil survey research provide a sound basis for detailed investigation of soils and archaeological site distributions. (38)

Davidson, T. E. (see Beidleman, D. Katharine) (57)

Davis, Hester (Arkansas Archeological Survey) A STATE PLAN FOR ARCHAEOLOGY IN ARKANSAS The Arkansas Archeological Survey is developing a state plan for conservation of archaeological resources, under cooperative agreement with HCRS. The meat of the plan is a series of study units based upon the planning model developed by HCRS. These study units include statements on research potential (in time, space, and/or content), constraints upon achieving the potential, and priorities for devoting time, money, and energy to reach goals. The plan also includes a summary of past researcher's annotated bibliography, a review of collections and records outside the state, and a discussion of the decision-making process in Arkansas. (9)

Davis, Stanley D. (U.S.D.A. Forest Service) HIDDEN FALLS: A MULTICOMPONENT SITE IN THE ALEXANDER ARCHIPELAGO OF THE NORTHWEST COAST Hidden Falls is a deeply stratified multicomponent site on the northeast coast of Baranof Island in Southeastern Alaska. Ten well defined stratigraphic units identified at the site contain five major cultural components extending from a late Pleistocene microlithic component to a historic sawmill of the early twentieth century. The earliest occupation of the site predates the last glacial advance. Spruce wood fragments taken from the lodgement till overlying portions of the earliest occupation dated 9860 ± 70 and 9410 ± 70 (SI-3776, SI-3778). Included within this range are three other components: an early ground slate horizon with little faunal preservation; a ground stone assemblage in association with a large shell concentration; and a late prehistoric occupation which is possibly proto-Tlingit. (24)

Day, Jane (Boulder) USING A PRIVATE COLLECTION OF CERAMICS FOR RESEARCH IN COSTA RICAN PREHISTORY Scientific excavation in the Guanacaste region of Costa Rica had produced a basic chronology associated with thousands of sherds but has turned up only a limited number of provenienced whole vessels. One unique private collection in this area, while lacking original context, had been fully preserved by the owner. Several thousand vessels, both decorated and

utilitarian, represent 2000 years of ceramic technology; it is important to attempt to incorporate these vessels and the information they can give us into the known scientific framework of the region. (2)

**De Atley, Suzanne (Smithsonian) MEASURING STANDARDIZATION IN CERAMIC PRODUCTION IN THE PREHISTORIC SOUTHWEST** Extensive application of various types of material analysis have demonstrated the presence of marked variability in the selection and use of ceramic resources in the American Southwest. However, the role of productive strategies in explaining this variability is rarely systematically explored. The purpose of the research reported here is to characterize patterns of material variation exhibited in ceramics from sites where production patterns have been hypothesized to be quite distinct (i.e., household production vs. part-time specialization). An assessment of the heterogeneity or homogeneity of resource use at these sites provides a means to infer the degree of standardization involved for the different modes of production. The results of a series of analyses by neutron activation, petrography, and microprobe are presented and discussed. (54)

**De Barros, Philip L. (UCLA) THE EFFECTS OF SITE DURATION VARIABILITY UPON THE RESULTS OF FREQUENCY SERIATION.** It is argued that the nature of the effects of variable occupation span upon frequency seriation has not yet been clearly elucidated. Such clarification is provided by graphic models used to generate simulated data that is then seriated. The assumptions underlying such a procedure are thoroughly analyzed. Possible solutions to the problem of site duration variability are discussed, including those proposed by previous authors. It is concluded that the problem cannot be easily resolved, but only limited in its effects. It is argued that site duration variability, like sampling error and spatial variability, will always limit the precision of seriation. (35)

**Del Bene, Terry A. and Gerald A. Holly (Connecticut) THEORETICAL CONSIDERATIONS OF USE-WEAR ANALYSIS** In their search for methods to determine the manners in which prehistoric lithic implements were manufactured and utilized investigators have turned to microscopic use-wear analysis. More concern has been expressed about the correlations of microscopic attributes with specific functions than how these patterns might be interpreted on a regional basis. This paper suggests that emphasis might best be directed towards the determination of site function rather than specific implement function. The site function is based more on the sum of the observed wear patterns and therefore might be more relevant to intersite comparison. (37)

**Demarest, Arthur A. (Harvard) THE DATING AND CULTURAL ASSOCIATIONS OF THE "POT-BELLIED" SCULPTURAL STYLE** For decades the "pot-bellied" monuments have been the center of a controversy in Mesoamerican archaeology. These massive boulder sculptures have been found at numerous sites associated with the major culture-historical problems of the Preclassic period. Nonetheless, secure dating of the style has not been possible and they have been subjected to conflicting interpretations. This paper describes new evidence from the site of Santa Leticia, El Salvador, which securely dates several "pot-bellied" monuments, associating them with a pristine Late Preclassic village. Based on these discoveries, an interpretation of the nature and significance of this culture complex is undertaken. (39)

**Demarest, Arthur A. (Harvard) LATE PRECLASSIC INTERACTION IN SOUTHERN MESOAMERICA: THE CERAMIC EVIDENCE FROM WESTERN EL SALVADOR** A better understanding of the Late Preclassic ceramics of El Salvador is a prerequisite for the solution of several major problems concerning the rise of Maya civilization. Excavations at Santa Leticia, a Late Preclassic village in western El Salvador, recovered a large ceramic assemblage from undisturbed trash pits. The Santa Leticia ceramics were analyzed using several contrasting classificatory schemes. This paper discusses the results of these analyses and their implications for both longstanding culture-historical problems and the current methodological debate over alternative approaches to ceramic classification. (59)

Demarest, A. (see Willey, Gordon R.) (39)

**Dent, Richard J. (National Colonial Farm) AMERIND SOCIETY AND PALEOECOLOGICAL RECONSTRUCTION IN THE UPPER DELAWARE VALLEY** The focus of this paper concerns reconstructing the ecological diversity of the Upper Delaware Valley in northeastern Pennsylvania during the 15,000 years which have elapsed since the retreat of the Wisconsin glacial intrusion. Statements are also presented about the relationship of this ecology to Amerind populations inhabiting the valley during much of this time period. Conclusions reached call into question some of the basic tenets of eastern North American archaeology and especially demand a rethinking of our conceptions of Paleoindians as well as later prehistoric groups. (47)

**DePratter, Chester B., Charles M. Hudson, and Marvin T. Smith (Georgia) JUAN PARDO'S EXPLORATIONS IN THE INTERIOR SOUTHEAST, 1566-1568** A previously unused document makes

it possible to reconstruct Juan Pardo's explorations in the Southeast in 1566-1568. Some of the towns and larger political entities he reached can be located with reasonable accuracy. The location of these towns and chiefdoms in South Carolina, North Carolina, and Tennessee has implications for future archaeological and ethnohistorical research. (61)

**Dickson, D. Bruce (Texas A&M) THE YANOMAMO OF THE MISSISSIPPI VALLEY? SOME REFLECTIONS ON LARSON (1972), GIBSON (1974), AND MISSISSIPPIAN PERIOD WARFARE IN THE SOUTHEASTERN UNITED STATES** Larson's (1972) hypothesis that warfare during the Mississippian period in the Southeast was primarily a struggle over the fertile silt and sandy loam bottomland soils is summarized. This explanation is contrasted with Gibson's (1974) thesis that, at least in the Lower Mississippi Valley, warfare was caused by the "asymmetrical" nature of the kinship systems found there. The Larson-Gibson dispute is characterized essentially as an ontological argument that pits the materialist's view of reality against that of the idealist. This dispute is compared to a similar one between Harris (1974, 1975, 1979) and Lizot (1977) concerning the explanation of Yanomamo warfare in South America. The basic material conditions of Mississippian warfare are suggested. The importance of mechanisms such as Gibson proposes in understanding Mississippian warfare at the "tactical" level is recognized, but primacy is given to Larson's materialism at the "strategic" level. (33)

**Dillehay, Tom D. (Kentucky) FORMATIVE PERIOD ASPECTS OF MAPUCHE SOCIETY** The historic and present-day Mapuche society and culture of south-central Chile are examined in respect to certain archeologically defined "Formative" period cultural characteristics which are thought to represent socioeconomic patterns of Andean continuity seen in past cultures of the Central Andean region. The significance of these data are discussed in regard to recurring patterns of Andean behavior across time and space. (46)

**Di Peso, Charles C. (Amerind Foundation) DISPLACED NATIVE AMERICANS AS DESCRIBED IN THE FUENTES/THERAN DIARIES OF THE WARS OF THE NATIONS OF THE JANOS, JOCOMES, MANSOS, SUMAS, CHINARRAS, AND THE APACHES, 1695** Archaeohistoric studies of southeastern Arizona reveal the social mechanism of population displacement caused by culture conquest. The archaeological data indicate the difficulty of isolating the material culture of a displaced group and reflect on the culture mix and change that can result from such dispossession. When the donor culture or dominant alien group is not present in a specific locus where displaced groups have gathered, there are even greater problems for archaeologists who attempt to recreate historical continuums without benefit of written records. (53)

**Dirst, Victoria (Wisconsin-Oshkosh) THE EVOLUTION OF EXCHANGE SYSTEMS IN WISCONSIN** In Wisconsin the archaeological evidence of trade in durable goods allows one to trace the evolution of exchange mechanisms from the Archaic into the early Historic Period. Although trade goods varied through time, it is proposed that the structure and functions of trade remained much the same until the birth of the European fur trade. Catchment analysis provides some insights into the possible reasons for such stability. (23)

**Dodge, William A. (Indian Health Service) ARCHAEOLOGICAL INVESTIGATIONS AT COCHITI AND JEMEZ PUEBLOS, NEW MEXICO** Indian Health Service, Albuquerque Area Office, is presently conducting archaeological monitoring programs at Cochiti and Jemez Pueblos in conjunction with sanitation facilities construction projects. Collection of artifactual and nonartifactual data is providing information pertaining to the culture history of these pueblos as well as providing insight into post-depositional processes. The history of this monitoring program and a discussion of the progress of the project will be presented. (54)

**Donahue, Randolph E. (Michigan State) ROUNDING OFF THE CORNERS OF INTENSIVE SURFACE SAMPLING** Intensive surface sampling of archaeological sites can provide a much more useful and representative sample than simple grab-samples. The frequently used grid system approach is highly inefficient and very time consuming, characteristics not regarded as favorable. At the Roman and paleolithic site of La Befa the central stake surface sampling technique that incorporates Binford's dog-leash technique was tested and shown to be very efficient while maintaining statistical and spatial control. This technique shows tremendous promise for regional studies where intensive intra-site surface sampling has not been heavily relied upon because of time-costs. (5)

**Doran, Glen H. (UC-Davis) CENTRAL CALIFORNIA PALEODEMOGRAPHY** Paleodemography examines population size and structure. Size is inferred from various types of data but structure can be inferred only from representative skeletal samples. Central California provides optimal conditions for paleodemographic studies. The large skeletal sample is partitioned into chronologically distinct subsamples. Life tables and their analysis allows study of demographic variation

through time. Archaeologists observe increasing sedentism and reliance on acorns between 4000 and 300 B.P. Traditionally these changes are considered to be responsible for changes in the incidence of transverse lines and enamel hypoplasia. This report argues that subsistence and settlement changes and their biological consequences produced observable demographic changes. (63)

Drennan, Robert D. (Pittsburgh) **CHANGES IN SOCIAL SCALE AND ORGANIZATIONAL COMPLEXITY: THE TEHUACAN VALLEY ANALYZED FOR COMPARISON** Changes in social scale and organizational complexity in Mexico's Tehuacán Valley during the Formative and Classic periods can be monitored through several different aspects observable archaeologically. Quantitative assessment of these aspects provides a basis for comparison of social changes there with those in other nearby regions of Mesoamerica. This comparison lays the foundation for a better understanding of the processes through which social changes occur by permitting a comparative evaluation of the quantitative fit between stimuli, stresses, or circumstances and the putative social responses to them. (58)

Driskell, Boyce N. (see Collins, M. B.) (23)

Drolet, Bob (Illinois) **A BASALT COBBLE INDUSTRY ALONG THE MOIST SLOPES OF CARIBBEAN, EASTERN PANAMA** A specialized manufacturing center for the production of lithic tools was discovered in the Bajo Grande valley of Rio Cuango, in Caribbean east Panama. This lithic industry was carefully studied at one site, PC 001, where specific information was obtained on economic aspects of this early tropical forest settlement. The excavated assemblage includes a great variety of tools which demonstrate that marine fishing and palm nut preparation were important tasks in addition to forest clearing. The activities suggested by the PC 001 lithic assemblage demonstrate adaptive adjustment by tropical forest groups. This early settlement thus offers information on the evolution and formation of the chiefdoms known from tropical Lower Central America and northern South America. (2)

DuBois, Robert L., Sheng-Shyong Lee, Tien Shaing Hsue and Travis A. Tull (Oklahoma) **ANCIENT GEOMAGNETIC INTENSITY IN MESOAMERICA AND SOUTHWESTERN UNITED STATES—A USEFUL CHRONOLOGICAL BASE?** Archaeomagnetic measurements made on 450 specimens of baked clay and pottery suggest that the geomagnetic field has varied in magnitude from 0.8 to 1.5 times its present value during the past 2500 years. Maximum values occurred at approximately A.D. 400, 1150 and 1700; minimum values, at A.D. 200, 750 and 1500. Specimens came from various locations in Mesoamerica and southwestern United States; the intensity data were estimated by the Thellier method. Artificial experiments reproduced intensity data within 3%, using baked clay specimens, and within 6% for pottery pieces. (11)

Earle, Timothy (UCLA) **ARCHAEOLOGICAL APPROACHES TO EXCHANGE** This paper discusses four general techniques available to archaeologists for studying prehistoric exchange. These techniques are (1) source identification, (2) stylistic analysis, (3) analysis of production, and (4) studies of exchange facilities. The paper describes the different techniques, the types of data recovered, the particular exchange-related behavior studied, and problems with each technique. Advantages and limitations of the approaches are discussed, and a potential research design combining approaches is outlined. (26)

Early, Ann M. (Arkansas Arch. Survey) **CADDOAN SETTLEMENT SYSTEMS IN THE OUACHITA RIVER VALLEY** Caddoan culture, a regional variant of Mississippian culture, encompasses several locally distinct, prehistoric horticultural societies. Local physiography and culture history contribute to shaping the nature of these subregional units. The Ouachita valley encompasses two distinct physiographic zones in close proximity to each other. The pattern of Caddoan settlement derived from data gathered in the last decade indicates that Caddoan settlement patterns differ significantly between the two areas. By applying newly formulated models of Mississippian subsistence and social organization to these data, hypotheses concerning economic base and populations size hierarchies are generated. (42)

Early, Ann M. (see Scheibel, Russell G.) (42)

Eaton, Jack D. (Texas-San Antonio) **ARCHITECTURE AND SETTLEMENT AT COLHA** Initial settlement and architectural studies at Colha during the 1979 and 1980 field seasons have provided information about community structure and technology. Studies show that Colha has a large civic-religious center, an extensive domestic and lithic tool production zone, and an agricultural sustaining area. Excavations in the monumental center and a plazuela uncovered structural remains of Classic and Early Postclassic buildings. The structures and workshops indicate that Colha was an important lithic industry in the Preclassic and in subsequent periods. (18)

Eberle, Bruce A. (Federal Highway Administration) **HISTORIC AND ARCHAEOLOGICAL PRESERVATION IN THE FEDERAL-AID HIGHWAY PROGRAM** Obtaining the appropriate information needed to comply with the many Federal laws and regulations concerning archaeological resources continues to pose problems for the Federal Highway Administration (FHWA). In an effort to ensure that the decision maker and the public are apprised of the appropriate type and level of information at key decision points in the project development process, the FHWA employs a two-step approach—identification and evaluation. FHWA believes that environmental concerns, such as archaeological resources, are more adequately considered through a combination of regulations and mutual trust and understanding among all parties rather than through reliance on extensive requirements and detailed procedures. (44)

Ebright, C. A. (SUNY-Binghamton) **PREHISTORIC QUARTZITE UTILIZATION IN SOUTHEASTERN PENNSYLVANIA** Quartzite constitutes a major lithic resource extensively utilized in the Northeast during the Archaic and Transitional periods. In southeastern Pennsylvania, quartzite is one of several non-chert lithic materials in use, and the Hardyston Formation of Cambrian age forms the primary source. Hardyston quartzite is a sedimentary quartzite which was quarried directly from bedrock deposits. The Robesonian Quartzite Quarry is an undisturbed quarry site in the Hardyston Formation which serves as a basis for analysis. Two major problems are the need to deal effectively with massive amounts of archaeological materials related to a biface reduction industry, and the need to separate these materials and features from the natural products of geological processes operating on the site. (43)

Eckles, David G. (State of Wyoming) **ABANDONMENT OF NORTHEASTERN BLACK MESA, ARIZONA—THE TEMPERATURE CONNECTION** Environmental change has often been posited as a primary cause of prehistoric culture change in the American Southwest. Usually, culture changes have been correlated with changes from more mesic environmental conditions to more drought-like conditions. An overlooked aspect of environmental change is change in the length of the growing season. Such changes in growing season length affect all agricultural peoples; this effect becomes all the more critical the higher in elevation crops are grown. On Northeastern Black Mesa, Arizona, where elevations range from 6000 to 8000 feet, such a problem may have affected Anasazi agricultural efforts. This paper examines the hypothesis that change in growing season length, and not drought, was the major environmental stress affecting agricultural efforts on Black Mesa. (54)

Effland, Richard (see Green, Margerie) (36)

Effland, Richard W. Jr. (Archaeological Consulting Service) **A STUDY OF PREHISTORICAL SPATIAL BEHAVIOR: LONG HOUSE VALLEY, NORTHEASTERN ARIZONA** An innovative approach to the study of prehistoric behavior is offered. Models and theories drawn from decision theory and settlement theory are linked with a model of spatial structure. Spatially related concepts help direct the analysis of data from Long House Valley in northeastern Arizona. Based on these data, a series of quantitative measures show that between A.D. 1050 and 1300 spatial behavior in the valley changed markedly. These changes were related to density-dependent conditions which created a process of competition for space. (36)

Eighmy, J. L., K. J. Berry and P. W. Mielke (Colorado State) **TESTING CONTEMPORANEITY: A NEW STATISTIC FOR COMPARING ARCHAEOLOGICAL SAMPLES** Increasingly, archaeologists are asking whether similar archaeomagnetic dates are actually of different ages. To answer this question it is necessary to know whether the archaeomagnetic directions form statistically discrete clusters. Current statistics to do this test assume specimen directions are normally distributed and the samples have equal variances. Because serious questions of normality and equal variance can be raised, an alternative statistic is described and illustrated; this is multi-response permutation procedures (MRPP), which can yield exact and rigorous tests of directional differences without requiring normality or variance assumptions. (11)

Einhaus, Catherine S. (Temple) **QUESTIONS ON THE FORMATIVE IN WESTERN PANAMA** Both earlier and later periods in this area of the wet tropics are better known than the Formative. Recent excavations and survey provide radiocarbon dates for the period and shift the emphasis from ceramic gravegoods to ecological, subsistence and social questions in this period of changing adaptations. A middle altitude occupation in Chiriqui Province containing the scarified ceramics characteristic of the Formative is compared to Formative occupations in nearby Costa Rica and with post-Formative occupations within Chiriqui in an attempt to answer some of these questions. (2)

Epstein, Stephen M. (University Museum-Pennsylvania) **ANALYSIS OF ARTIFACTS FROM SANTA RITA (BELIZE)** With the development of reliable methods of trace element analysis, a variety of

materials can yield a new range of archaeologically interesting information. Obsidian and jade can be traced to their source areas and their trade routes reconstructed; ceramics can be proven to be locally manufactured or imported from other areas; metal can reveal the source of its ore and details of its industrial technology. The potential and limitations of two of these techniques, neutron activation analysis and proton activated x-ray fluorescence, will be compared with respect to the analysis of artifacts from Santa Rita (Belize). (52)

Erickson, Ken and William B. Fawcett (Wyoming) HISTORICAL ARCHAEOLOGY AT A UNION PACIFIC RAILROAD STATION IN THE RED DESERT OF WYOMING The artifactual material from "Separation," a railroad station located on the first transcontinental railroad, is analyzed in order to evaluate various means of dating, function identification, subsistence, and general artifactual patterns. Artifact frequencies and their potential for social and economic interpretations are examined and compared with patterns developed by S. South, those derived from recently investigated late nineteenth-century sites in Wyoming, and from ethnographic and historical information relevant to marginal frontier settlements on the Northwestern Plains. (4)

Ericson, J. E., and A. Barite and K. Ulrich (Harvard) ANALOGS IN REGIONAL EXCHANGE STUDIES The paper will discuss in general the question "why model?" and will review past attempts. Advances have been made in developing mathematical and electrical analogs useful for studying regional exchange. The effects of boundaries, varying forms of behavior, and exchange of perishable resources can be simulated. As an example, computer simulation of direct access versus regional exchange models can be evaluated in terms of energy conservation. Data and examples of regional systems will be drawn from California prehistory. (26)

Ericson, J. E. (see Coughlin, E. A.) (38)

Essenpreis, Patricia S. (Loyola) COMMUNITY PATTERNING AT THE ANDERSON VILLAGE SITE IN SOUTHWESTERN OHIO Reanalysis of the Anderson Village site in southwestern Ohio reveals a series of at least three Fort Ancient components. Data for one of these components show an oval village, approximately 100 meters by 75 meters, with a central plaza surrounded by burials and storage/refuse pits. Evidence for houses is equivocal; Moorehead notes circular "house rings" approximately seven to ten meters in diameter. The pattern is distinct from that at the Incinerator site although both sites belong to the Anderson Phase and date to the 13th century. It is suggested that Anderson and Incinerator represent the grafting of "Fort Ancient" traits onto distinct local cultural systems. (40)

Ettlinger, Nancy (Oklahoma) EXCAVATIONS OF THE PULLTROUSER SWAMP/RAISED FIELD PROJECT: THE SOUTHERN AREA Excavations of settlements in proximity to Pulltrouser Swamp are discussed. Test pits were excavated at an acropolis (Kokeal) and structures in the immediate area. The stratigraphic and ceramic records indicate Early and Late Classic occupations at the acropolis and a Preclassic through Late Classic occupation with respect to the house mound population. The recovery of some possible Swazey sherds from mounds may indicate the presence of an earlier occupational horizon. Whereas house mound architecture in the area entails simple, inexpensive rubble construction, the artifactual record indicates the presence of some degree of wealth. (8)

Euler, Robert C. (Grand Canyon National Park/Southern Illinois-Carbondale) NEW EVIDENCE OF THE PINTO BASIN COMPLEX AT GRAND CANYON, ARIZONA This paper presents previously unpublished data regarding the occurrence of the Archaic Pinto Basin Complex near Grand Canyon and discusses the implications of these to the hypothesis that it was related to the Grand Canyon Split Twig Figurine Complex which in part has a similar antiquity and geographic distribution. (54)

Evans, June (American) PALEOINDIAN TO EARLY ARCHAIC TRANSITION AT THE SHAWNEE-MINISINK SITE Two buried and stratigraphically separate components at the Shawnee-Minisink site in the northeastern Pennsylvania lend themselves to interpretive comments about cultural continuity and change both at the site itself and in the Upper Delaware Valley region in general, particularly in relation to concurrent changes in ecological setting. The lithic assemblages from these components, one Paleoindian and the other early Early Archaic, are described, compared, and discussed. Computer-aided statistical techniques including factor analysis and sequential agglomerative hierarchical cluster analysis were used to facilitate the lithic assemblage comparisons and interpretation. (47)

Evans, Jane G. (see Woodall, J. Ned) (44)

Fagan, Brian M. (UC-Santa Barbara) POPULARIZATION OF ARCHAEOLOGY A survey of efforts at popularizing archaeology for a wider audience, which attempts to define ways in which archae-

ologists can communicate with lay people. Various ways of popular communication are discussed, and strategies for future efforts are evaluated. The paper ends with a discussion of the future of archaeology in the popular eye, as one of many academic specialties helping solve broad, multidisciplinary problems. The challenge for archaeologists is to train the specialist popularizers who can communicate this future role effectively. (22)

Farley, Tillman (see Charles, Douglas K.) (23)

Fash, Jr., William L. (Harvard) HISTORY AND CHARACTERISTICS OF SETTLEMENT IN THE COPAN VALLEY, AND SOME COMPARISONS WITH QUIRIGUA The geographic and ecological settings of the Copan and Lower Motagua valleys are compared, and the similarities in Late Classic settlements and adaptations to the two areas are discussed. The history of settlement in the Copan Valley is presented, and the nature of Late Classic society is dealt with. The amount of alluviation and river-course change at the two sites are considered as important factors to be taken into account in settlement pattern studies, and the question of "invisible structures" or other buried cultural vestiges is examined in some detail. (39)

Fash, William L. (see Vleck, David T.) (39)

Fedder, Kenneth (Central Connecticut) THE FARMINGTON RIVER ARCHAEOLOGICAL PROJECT: FOCUS ON A SMALL RIVER VALLEY The 1979 field season marked the initiation of the Farmington River Archaeological project (FRAP). The geographical focus of this survey is the Farmington River Valley, a medium-sized drainage unit flowing from the northwestern hills of Connecticut into the Connecticut River. The methodology has emphasized the recovery of detailed artifactual and subsistence data at a few sites rather than locating the maximum number of sites. Sites may thus be confidently placed within the context of a settlement model and the nature of the relationship between occupants of this tributary of the Connecticut River and the Connecticut itself can be explained. (29)

Feldman, Lawrence H. (Missouri) TRIBUTE AT MIDCENTURY: SIXTEENTH CENTURY GUATEMALAN TAX RECORDS An extensive study and comparison of the Cerrato Tax accessions of 1548-51 and related documents of the highlands and Pacific coast of Guatemala has been prepared by Feldman over the last several years. This paper will comment on problems encountered in the analysis and discuss the value of the documents for the archaeologist. Among other aspects, reference will be made to the quantification of agricultural crops, population statistics, and the presence of handicrafts (e.g., ceramics) in the more than 100 communities represented in this sample. (56)

Ferguson, Leland G. and Stanton W. Green (South Carolina) SOUTH APPALACHIAN MISSISSIPPIAN: POLITICS AND ENVIRONMENT IN THE OLD OLD SOUTH Models of late prehistoric (A.D. 800-1400) social systems in the Mississippi Valley (the so-called Middle Mississippian Complex) as ranked societies reliant upon flood plain agriculture in complement to wild resources are primarily derived from the distribution of temple mound sites in the flood plains of major drainages. In South Carolina, Georgia, and adjacent areas, beginning around A.D. 1100, temple mounds are associated with artifact profiles different from those in the Mississippi Valley. This complex has been referred to as South Appalachian Mississippian. This paper examines the locational pattern of a comprehensive sample of South Appalachian Mississippian temple mound sites to evaluate hypotheses for the sociopolitical and ecological adaptation of these late prehistoric populations. (33)

Ferguson, T. J. (see Mills, Barbara J.) (54)

Findlow, Frank J. and Marisa Bolognese (Columbia) AN INITIAL EXAMINATION OF PREHISTORIC OBSIDIAN EXCHANGE IN HIDALGO COUNTY, NEW MEXICO Recent archaeological surveys in southwestern New Mexico have produced much data relating to the prehistoric procurement and exchange of obsidian from the Antelope Wells source in Hidalgo County, New Mexico. Because the data are abundant and the obsidian source is relatively isolated geologically, the regional exchange of this obsidian can be observed in the absence of competing obsidian sources. Initial data analyses permit both empirical descriptions and development of mathematical models illustrating the exchange of this obsidian in the face of various environmental and cultural constraints. (26)

Fisher, Charles (R.P.I.) TRIANGULAR POINT FORM AND SITE AGE DURING THE WOODLAND PERIOD IN EASTERN NEW YORK STATE Two triangular point types have been recognized in the Late Middle Woodland and Late Woodland Periods in New York. Ritchie (1971) has described

their relationship in a developmental sequence from Levanna to the late Madison type. This suggests the possibility that a linear correlation exists between point form and site age. This paper describes an initial investigation of this relationship, which demonstrates a correlation between projectile point size and occupation period within eastern New York. A regression equation is presented for estimating occupation periods of sites containing triangular points. This equation is evaluated and discussed. (33)

Fitzhugh, William (see Nagle, Christopher) (43)

Fleming, A. (Sheffield) SOCIAL BOUNDARIES AND LAND BOUNDARIES Two models of development for the sociopolitical structure of neolithic societies are presented. The first considers that large reference groups with well-developed structures were important from the outset, and sees later development in terms of further internal development and/or amalgamation between these large units. The second takes the view that much smaller groups were present at the beginning, and that their later consolidation was a piecemeal process. On Dartmoor, an upland area in southwest England, the existence of second millennium B.C. land boundaries and contemporary settlements allows the examination of a comparison of these two models, with reference to conformity behavior, centralization/localization tendencies, and different levels of sociopolitical integration. (12)

Fleming, Stuart and Nicholas Hartmann (University Museum-Pennsylvania) SCIENTIFIC DATING TECHNIQUES: THEIR POTENTIAL IN THE COROZAL POSTCLASSIC PROJECT The richness of artifacts in Postclassic occupation contexts offers a broad platform for technical study of this important Maya period, particularly in chronology-building. Thermoluminescence dating of pottery, radiocarbon analysis of organic remains, amino-acid racemization properties of skeletal material, and the hydration rim analysis of obsidian are all potentially applicable. This paper will review the physical principles, relative accuracy and limitations of these methods, drawing illustrations from the 1979 excavation at Santa Rita (Belize). (52)

Ford, Anabel (California-Santa Barbara) CLASSIC MAYA SETTLEMENT PATTERNS AND PROBLEMS OF ECONOMIC AND POLITICAL COMPLEXITY Results of a Classic Period Maya (A.D. 250-900) settlement study in the intersite area between Tikal and Yaxha in the Northeastern Peten raise some interesting problems bearing on our understanding of Late Classic Maya (A.D. 550-900) economic and political organization. An analysis of this new data along with other comparable data from the region will be presented. Variables such as settlement density, residential unit composition and labor investment, and environmental characteristics will be employed in an effort to isolate distinguishing features between central and non-central zones. Some tentative explanations of the data will be considered. (56)

Foster, Michael S. (Texas-El Paso) LOMA SAN GABRIEL-CHALCHIHUITES. CULTURE CONTACT AND ACCULTURATION ON THE NORTHWEST PERIPHERY OF MESOAMERICA Settled village life apparently was established along the eastern foothills of the Sierra Madre Occidental in northern Mexico well before A.D. 1. The best known of the area's many cultures is the Loma San Gabriel, a sub-Mesoamerican culture in that it has basic Mesoamerican elements such as elementary agriculture, simple ceramics, primitive architecture, hamlet life, and a dispersed inter- and intra-site settlement patterns. Beginning about A.D. 300, the area comes under strong Mesoamerican influence and occupation in the form of the Chalchihuites culture. Although strongly influenced, Loma San Gabriel appears to maintain its cultural identity. This paper analyzes the forms of influence and their ultimate effect on Loma San Gabriel's cultural survival. (53)

Fowler, William R. Jr. (Calgary) POSTCLASSIC INTERREGIONAL NETWORKS IN THE CENTRAL BASIN OF EL SALVADOR By comparing data on settlement patterns, architecture and material culture complexes a strong case can be made that Cihuatán and Santa María, the best known Postclassic sites in the Central Basin of El Salvador, were occupied by the same ethnic group. The data supporting the claim of ethnic unity between Cihuatán and Santa María are presented. Alternative hypotheses concerning the processes that could have been responsible for the close links between the two sites are presented. (59)

Franklin, Hayward H. (Eastern New Mexico) STYLISTIC RELATIONSHIPS BETWEEN MESA VERDE B/W The hypothesis of an origin of certain Mesa Verde B/W "allover" designs in the White Mountain Redware tradition is evaluated. Design parallels, contemporaneity of styles, as well as evidence of trade in redwares north of the San Juan River give support for this hypothesis. (54)

Fredrickson, David (see Brown, Marley R.) (44)

Friedman, Janet (USDA Forest Service) CULTURAL RESOURCE MANAGEMENT AND PLANNING IN THE FOREST SERVICE Recent legislation and regulation, especially the Resources Planning Act (RPA) as amended by the National Forest Management Act (NFMA), make formal planning increasingly important in the management of our National Forests. Because the RPA and NFMA will dictate the basic direction Forest management will take for decades into the future, archaeologists have a special opportunity and responsibility to ensure that cultural resource considerations are input at the earliest stages of the planning and budgeting processes. This paper reviews the importance and potential of RPA and NFMA, discusses what has to be done to involve cultural resource considerations in the planning and budgeting processes, and proposes direction for the future. (44)

Frison, George C. (Wyoming) FLUTING OF FOLSOM PROJECTILE POINTS: NEW ARCHAEOLOGICAL EVIDENCE The technology of fluting Folsom projectile points has been a subject of interest and speculation to archeologists since the first recognition of the Folsom cultural complex. To date discussions on the subject have been limited to observations on finished products, debris of manufacture, and experimentation. Recent recovery of what is believed to be an antler tool used in fluting process offers strong evidence that continually increasing pressure delivered by some simple leverage mechanism may have been the method used. The tool was made from the first brow tine of a large, mature elk antler. (37)

Fritz, Gayle J. and Robert H. Ray (Arkansas Arch. Survey) ROCK ART SITES IN THE SOUTHERN ARKANSAS OZARKS Aboriginal rock art sites along the southern fringe of the Ozark Highlands in Arkansas display technical and stylistic variations that might correspond to distinct prehistoric cultural groups. At least two areal manifestations are apparent. Pictograph sites clustered in the central part of this region appear to be related to occupation of the Arkansas River Valley. Sites at the eastern end of the region contain pecked symbols similar to those found elsewhere along the Mississippi River. Examination of the rock art symbols allows preliminary statements to be made regarding function and time period represented. (42)

Fry, Robert E. (Arizona) CERAMIC CHRONOLOGY FOR RAISED FIELDS AT PULLTROUSER SWAMP (BAJO) AND ADJACENT SETTLEMENT AREAS Excavations in raised fields in the Orange Walk district in northern Belize have produced significantly larger collections of ceramics than previous projects. The ceramic data indicate that not all fields in the Pulltrouser Swamp complex were constructed simultaneously. Preliminary analysis suggests a Late Preclassic dating for the earliest raised fields. Other fields date from the Early Classic, while still others are of Late Classic date. Ceramic dates are compared with Carbon-14 dates for the same features. Excavations in structures immediately adjacent to the field system indicates a parallel occupation. Analysis indicates widespread sources of ceramics for this area far from a major ceremonial center. (8)

Gadacz, René R. (Calgary) SITE STRUCTURE MORPHOLOGY OF MESOAMERICAN CEREMONIAL AND URBAN CENTERS The use of graph theory in network geometry has tremendous potential in analyzing the site structure morphology of Lowland Maya and Highland Mexican sites. Included within this micro-level network analysis are techniques permitting the formulation of hypotheses concerning planning trends through time. Statistical expression of patterns of communication within sites, in terms of accessibility and seclusion, takes on significance when viewed in terms of social and institutional organization as one progresses from Theocratic to Militaristic times. In some cases, morphological changes cannot be correlated with traditionally accepted phase designations. The utility of graph theory as a methodological tool is evaluated and recommended. (34)

Gagliano, Sherwood M. (Coastal Environments) APPROACH TO DROWNED TERRESTRIAL SITE ARCHAEOLOGY, NORTHERN GULF OF MEXICO CONTINENTAL SHELF Federally permitted development of oil and gas resources has necessitated an evaluation of cultural resource potential on the Continental Shelf. This evaluation, in addition to recently acquired data, proves the basis for a method and theory for the study of offshore terrestrial archaeological sites. Models of settlement and environmental utilization developed from the prehistoric archaeological record in active onshore coastal systems provide the basis for identifying high probability areas for sites in relict offshore systems. Side-scan sonar, sub-bottom profilers, and magnetometers have been employed to identify areas of high site probability. Core and grab samples, underwater television, diver inspection, and other techniques may also be employed to verify, delineate, and sample sites. (10)

Gaines, Sylvia W. (Arizona State) RECENT TRENDS IN COMPUTER TECHNOLOGY AND THEIR ROLE IN ARCHAEOLOGICAL DATA BANK APPLICATIONS The computer industry is rapidly developing new techniques which can play a significant role in current and future archaeological

data bank applications. Archaeologists must be aware of the capabilities which these provide in various aspects of data management and research. Technical trends including hardware, software, data processing and management, are summarized. Benefits of these new techniques are explored in relation to several ongoing archaeological projects. (6)

Gamble, Clive S. (Southampton) 'SURPLUS' PRODUCTION AND LEADERSHIP The Aegean emergence of leadership and the State in the bronze age is discussed from the perspective of subsistence organization. The consequences for such developments of production above the level of community self-sufficiency are examined together with the contribution that a surplus made to the establishment of effective political units. An explanation for the integration of potentially self-sufficient village communities into a wider polity is proposed that acknowledges the importance of dependent ties based on subsistence requirements. (12)

Gehlert, Sarah (see Lynch, Keith) (56)

Geismar, Joan H. (Columbia) SURFACE COLLECTION AS AN EFFECTIVE FIELD METHOD FOR ANALYSIS OF SKUNK HOLLOW, A COMMUNITY SITE A systematic surface collection of 22 features at Skunk Hollow, the ruins of a 19th-century rural black community on the Palisades of New Jersey, has provided data needed to complete a comparative study of a large site without excavation and with minimal site disturbance. Using this methodology it was possible to identify most of the features and determine chronology; intrasite status differences were also investigated. Given similar problem orientations and field situations, this method is optimal for archaeological investigation while maintaining the integrity of a site. (5)

Gero, Joan M. (Mass.-Amherst) STYLISTIC INFORMATION IN COMMON FLAKE TOOLS Recent research on the lithic technology of the Formative Period in Peru is presented to demonstrate how attributes of highly variant flake tools can be systematized to reflect temporal and functional change. A set of "stylistic" attributes for flake tools are then identified as those which vary over time within a repetitive functional context, in contrast to a set of "functional" attributes which are seen to vary between different economic contexts at a fixed point in time. (37)

Gibbon, Guy E. (Minnesota) POSITIVISM AND THE NEW ARCHAEOLOGY New archaeologists began to adopt "positivism" as a methodological doctrine and as a descriptive account of empirical science at the same time as an antipositivist tendency began to dominate contemporary philosophy of natural and social science. Several of the criticized doctrines of strict positivism are reviewed. It is concluded that positivism as a philosophy of science has many laudable goals when only vaguely defined as is common in archaeology; when more strictly defined, however, positivism has been shown to be an unnecessarily restrictive methodological doctrine and a too narrow descriptive account of empirical science. The implications of these conclusions for research within archaeology are discussed. (16)

Gibson, Eric C. (see Levy, Richard C.) (35)

Gifford, John (see Collins, Susan) (3)

Gill, George W. (Wyoming) CULTURAL IMPLICATIONS OF ARTIFICIALLY MODIFIED HUMAN REMAINS FROM NORTHWEST MEXICO Numerous decorated teeth and artificially deformed human crania were recovered from 19 Postclassic Period burial mounds at 10 archaeological sites in coastal West Mexico, in the period 1968-74. The sites are located within an estuarine lagoon-swamp called Teacapan Estuary which covers parts of southern Sinaloa and Northern Nayarit and in turn constitutes part of the greater Marismas Nacionales. The styles of decorated teeth and deformed skulls provide valuable information regarding aesthetics and ritual practices in prehistoric West Mexico as well as knowledge about directions of cultural diffusion and population movement. (41)

Gilman, Antonio (CSU-Northridge) THE ORIGINS OF SOCIAL STRATIFICATION IN LATER PREHISTORIC EUROPE The emergence of a hereditary elite class in Bronze Age Europe is now widely interpreted in terms of the redistributive activities of a managerial class. This functionalist account of elite origins goes against a uniformitarian understanding of what ruling classes do in complex societies. The rise of hereditary, superordinate social strata in prehistoric Europe is better understood as a consequence of social conflicts attendant upon the development of capital-intensive subsistence techniques. The observations that capital-intensification preceded elite emergence and that areas with greater intensification exhibited greater social inequalities confirm a non-functionalist account of the development of stratification in later prehistoric Europe. (30)

Gilman, Patricia A. (see Anyon, Roger) (27)

Gladfelter, Bruce G. (see Tiedmann, Glifford E.) (5)

Gladfelter, Bruce G. (see Phillips, James L.) (23)

Gledhill, J. and M. J. Rowlands (London) MATERIALISM AND SOCIO-ECONOMIC PROCESS IN MULTILINEAR EVOLUTION Rejecting various forms of vulgar materialistic and functionalist explanation characteristic of theories of social evolution since Steward, we propose a framework based on a general conceptualization of 'social formations' as structured systems with historically specific dynamic tendencies drawn from political economy. We advance general propositions concerning appropriate categories for theorizing tested with archaeological data, explore the relationships between social processes of production, consumption, distribution and circulation in the context of socio-political change in a series of empirical cases, and demonstrate the importance of analyzing differential evolution among historically related societies in terms of processes within global systems. (12)

Giurac, Petar (UC-Berkeley) BEHAVIORAL IMPLICATIONS OF THE PHYSICAL EXAMINATION OF METALLURGICAL DATA Using data from the site of Selevac in Yugoslavia, this paper explores the behavioral implications we can draw from the remains of metallurgy, specifically from its physical properties. Methods of ore extraction and treatment and their effects on the wider socioeconomic system are examined. Elemental or fingerprint analysis is employed to identify the ore source, and the loci of mining and metal extraction are compared. In the test case, these loci are far apart, which undoubtedly affected trade and transportation. (14)

Goad, Sharon I. (Louisiana State) COPENA BURIAL PRACTICES AND SOCIAL ORGANIZATION Analysis of differential distribution of mortuary artifacts from Middle Woodland Period Copena mounds in Northern Alabama suggests structural similarities and differences. The occurrence of certain classes of artifacts, symbolic of high status positions, is limited to a restricted number of individuals. The interment of these individuals at large, multimound sites, and the observed differences between these classes of individuals in terms of skeletal orientation and mortuary treatment, suggests a ranked society. This coupled with a detailed analysis of exotic mortuary material source areas and hierarchical settlement structure indicates that these individuals played an important role in Copena interregional exchange and perhaps in the socio-political organization of the group. (63)

Goff, Linda (see Hanks, Herrick E.) (44)

Goldstein, Lynne (Wisconsin-Milwaukee) ANNOTATED AZTALAN: A REGIONAL PERSPECTIVE OF THE CRAWFISH VALLEY IN SOUTHEASTERN WISCONSIN Aztalan is the most famous site in Wisconsin; many consider it an isolated outpost of Mississippian society. Although Aztalan theories abounded, little attempt was made to view the site in a regional perspective. Until recently, no representative survey of the surrounding area existed. Results of a long-term survey begun in 1976 indicate the area's unique environmental zones are a key to prehistoric site location. Prior to Mississippian, the proposed model suggests repeated occupation through time, rather than continuous occupation at one time. Aztalan is seen as reflecting a shift in both subsistence and settlement pattern. (23)

Goodman, Alan A. (see Armelagos, George J.) (63)

Goodman, Jeffrey D. (Archaeological Research Associates) A PALEOINDIAN ENGRAVED STONE FROM FLAGSTAFF, ARIZONA A small flat stone with distinct geometric engravings on both sides has been recovered from an exploratory shaft in Pleistocene deposits at Flagstaff, Arizona. A radiocarbon date on charcoal for the 15-foot level gave a date of approximately 25,000 years. The engraving came from a depth of 23 feet. Possible chert cores, flake debris, flakes and tools have also been recovered from the shaft; especially in two distinct zones. The engraving and micro-flaking which is characteristic of use-wear argue for the lithic collection being the result of man instead of nature. (54)

Goodsitt, Rochelle L. (Northwestern) DESIGNING A SIMPLE RECORDING SCHEME FOR LARGE LITHIC ASSEMBLAGES: AN EXAMPLE FROM THE KOSTER SITE Over 900 chert tools and tool fragments from horizon 8B, a Middle Archaic unit at Koster, were recorded in a simple 13-attribute scheme keyed to questions about manufacture, function and disposal of lithic materials. This scheme records basic descriptive information so that assemblages can be compared through time and on a regional scale; so that lithics can be used to substantiate or negate hypotheses

generated by the study of other material classes; and so that samples of lithic material for more detailed studies can be chosen in an informed manner. Recording is quick and replicable. (37)

Goodyear, Albert C. (Carolina) GENERAL ASPECTS OF PALEOINDIAN ADAPTATIONS IN NORTH AMERICA: A VIEW THROUGH THE RAW MATERIAL Empirically it can be seen that Paleoindian, and to a great extent, Early Archaic groups in North America, consistently used cryptocrystalline raw materials in their chipped stone technologies. A hypothesis is proposed to account for this pattern of selection based on the role of such material in a life-way of high geographic mobility. Factors of portability and flexibility are explicitly considered. (17)

Gorenstein, Shirley (Rensselaer) RECONSTRUCTING EARLY HISPANIC SETTLEMENT IN THE LAKE PATZCUARO BASIN There are a limited number of reliable primary documentary sources on sixteenth-century settlement in the Lake Patzcuaro Basin of Michoacan. An exclusively ethnohistorical approach did not permit a determination of the early hispanic settlement in the Basin. Another approach, combining ethnohistorical with contemporary data, succeeded in producing a more reliable reconstruction of early hispanic settlement. (41)

Gorman, Frederick J. E. (Boston) COMPUTER ANALYSES OF EXTENSIVE ARTIFACT INVENTORIES FROM ARCHAEOLOGICAL SITES Inventory analysis of sizable artifact assemblages is useful in the ethnic and functional classification of sites in historical and industrial archaeology. This approach may be applicable to prehistoric sites as well. Previous computer-assisted analyses of artifact inventories feature fixed constraints upon information processing that restrict the usefulness of these programs to the sites for which they were designed. This paper presents a general inventory analysis program that has completely flexible parameters. It can be adjusted to tabulate artifact inventories that differ in terms of their diversity or abundance from one site to another and which also vary according to the numbers of provenience units involved. (61)

Graff, Stephen H. (Temple) FUNCTIONAL ASPECTS OF GROUND STONE TOOL TECHNOLOGY This study examines a number of aspects of ground stone tool technology. Observations stemming from a series of experiments involving the replication and use of ground stone axes are presented. These observations address the processes of material selection, tool design, manufacture and the hafting of these implements from a functional perspective. The interrelationships between these elements of this technology are explored. Finally, the results of analysis examining the efficiency of various tool forms and manufacturing techniques are reviewed. (37)

Graff, Stephen H. (see McCarthy, John P.) (63)

Gramly, Richard M. (Maine State Museum) EXCAVATIONS AT THE MOUNT JASPER LITHIC SOURCE AREA Excavations of lithic workshops at Mt. Jasper in northern New Hampshire reveal that exploitation of the glassy rhyolite outcropping there began in Middle Archaic times (ca. 5000 B.C.) and lasted until the Ceramic Period. Worn-out, broken tools discarded on the workshops indicate that the miners' pattern of visitation varied through time. This fact has certain implications for the culture history of northern New England and is a valuable lesson for researchers working in other regions. (43)

Graves, Michael W. (Arizona) KALINGA INTERCOMMUNITY CERAMIC DESIGN DIFFERENTIATION Analyses of over 1000 ceramic vessels from four Kalinga communities of northern Luzon in the Philippines have identified intercommunity design differences. A number of models were tested to account for design variability among these communities. On the basis of work completed, regional differentiation plus intercommunity genealogical links account for much of the design variability. Other spatial and temporal effects have less effect on ceramic design. These results provide empirical support for the interaction intensity assumption employed by many archaeologists studying ceramic design variation. (58)

Graybill, Donald A. (Arizona) ARCHAEOLOGICAL AND PALEOCLIMATOLOGICAL UTILITY OF BRISTLECONE PINE IN THE GREAT BASIN The ongoing development of numerous tree-ring chronologies from the Great Basin will provide new controls for dating sites in the area. Several chronologies will exceed 1000 years in length and a few reach into the B.C. period. Analyses of 8000 years of one chronology from the western edge of the basin have provided preliminary insights into the nature of long-term climatic trends over that period. The concordance of this data with trends derived from pollen analysis and pack-rat midden studies is under investigation. (20)

Graybill, Jeffrey R. (Washington) THE EASTERN PERIPHERY OF FORT ANCIENT: ORIGINS AND DEVELOPMENT The origins of Fort Ancient in West Virginia and adjacent Ohio are as yet poorly known, although there is some stylistic evidence to indicate historical continuity with the

preceding Woodland era. An initial site chronology for the area argues for (a) historical continuity throughout the life of the Fort Ancient tradition, and (b) basic functional equivalency between village communities. Differences in size and structural complexity between sites occur within an evolutionary framework; they are not synchronous. They are most likely due to village fusion and/or population growth. (40)

Greber, N'omi (Cleveland Museum of Natural History) COMPARISONS OF GEOPHYSICAL REMOTE SENSING TECHNIQUE FOR USE IN SETTLEMENT PATTERN SURVEY The results of several geophysical remote sensing tests (magnetic, earth resistance, and surface radar) of known archaeological features associated with Hopewell earthworks in Ross County, Ohio, are given. Comparisons are made of various aspects including the type, quality, and quantity of information obtainable within reasonable cost and time requirements (both field and analyses). The object of these experiments is the design of an efficient survey technique for obtaining data on Central Scioto Hopewell settlement patterns. (25)

Green, Dee F. (USDA Forest Service) APPROACHES TO MASS ARCHAEOLOGICAL DATA STORAGE: THE USDA FOREST SERVICE SYSTEM The U.S. Forest Service has management responsibility for approximately 187 million acres of land. Current estimates indicate that between 3 and 5 million historic and prehistoric cultural resource sites may exist on this acreage. Rather than attempt to build a single master data file for all sites and site information, the Forest Service has adopted a regional approach which decentralizes the data and makes it available through several data banks, each specific to a region. The advantages and disadvantages of the decentralized system are explored. (6)

Green, Margerie and Richard Effland (Arch. Consulting Service) A REGIONAL PERSPECTIVE FOR THE STUDY OF SPATIAL RELATIONSHIPS A regional perspective for the study of spatial relationships is becoming more important to archaeologists, particularly those working in cultural resource management. One approach is offered here. Data from two recent surveys near the Grand Canyon in Arizona are used to illustrate the use of locational characteristics in (1) a regional perspective and (2) a cultural resource management framework. A predictive model of site location and regional comparison of spatial characteristics and organizational relationships are presented. (36)

Green, Stanton W. (see Ferguson, Leland G.) (33)

Green, Thomas J. (Idaho Historical Society) STATE PLANNING FOR ARCHAEOLOGY: THE IDAHO EXAMPLE State historic preservation planning is based on a sound research design. Effective planning should concentrate on relatively small geographical areas. It considers the past and present land use of the area, the geological processes allowing for the preservation of sites, the completed research and current conceptions of local prehistory, and succinctly formulated research goals reflecting both the historical and theoretical problems of the discipline. Planning efforts have to include the complete archaeological community of a state to be useful. (9)

Greenfield, Haskel J. (CUNY) INTEGRATING ARCHAEOLOGICAL AND EPIGRAPHIC INFORMATION IN MORTUARY ANALYSIS: THE "A" CEMETERY AT KISH Recent studies of early states in the Near East have largely ignored the rich corpus of excavated mortuary data. This information provides an invaluable means of testing expectation derived from contemporary epigraphic and settlement pattern analyses. The analysis of the "A" Cemetery at Kish, Iraq (Early Dynastic III B—Proto-Imperial Phase) illustrates the advantages inherent in this approach. A set of "emic" measures for the value of the different artifact associations is derived from the epigraphic sources. Hierarchically differentiated levels of access to wealth in the mortuary ritual are isolated. Their diversity corresponds well with the proposed expectations. (63)

Grove, Laurel K. (Arizona State) THE GREAT KIVA AS REDISTRIBUTIVE CENTER The issue of whether the Mogollon were economically integrated through the medium of kivas is addressed. The thrust of the research is twofold: one approach is a regional-analytic study of known Mogollon great kivas. The other is a case study of a particular Mogollon great kiva and the sites surrounding it. Preliminary results will be discussed. (27)

Guillen, Ann Cyphers (UNAM) CERAMICS AND CULTURAL DEVELOPMENT IN THE VALLEY OF XOCHICALOCO, MORELOS, MEXICO The analysis of pottery and the development of a ceramic chronology for the Valley of Xochicalco lends new interpretation to the kinds of cultural processes evident there. Although the area shows a clear cultural orientation to Valley of Mexico cultures during the Late Formative period, the Classic phases witness the development of a local character with few ties to Teotihuacan. The apogee of the Valley, occurring during the Epiclassic period, is best exemplified by the extensive and powerful occupation of Xochicalco. The Early



Postclassic represents a period of cultural impoverishment and possibly marks the beginning of Tlahaucan occupation. (34)

Gundersen, J. N. (see Holzhay, C. S.) (38)

Gyriscio, Geoffrey M. (George Washington) CASES OF DIRECT AND INCIDENTAL PROTECTION OF ARCHAEOLOGICAL SITES THROUGH EASEMENTS Outside California, there are few easements protecting properties that are primarily of archaeological importance. Easements protecting a mansion site in Virginia, a Woodland village site in Wisconsin, and sites in the Mimbres Valley of New Mexico provide valuable examples. As a result of the California Environmental Quality Act, many easements have been donated in California. Easement programs operated by organizations concerned with preserving historic buildings, open-space, natural areas, and farmland offer incidental protection for archaeological sites. Architectural preservationists, natural conservationists, and archaeologists need to cooperate in preserving all the natural and cultural resources of an area. (21)

Haas, Jonathan (see Henley, Laura A.) (57)

Halkey, Larry D. and Buford Rolin (Creek Nation East of the Mississippi) NATIVIST ARCHAEOLOGY BY THE POARCH BAND OF CREEKS IN ALABAMA Following the removal of Native Americans from the Southeast, there has been a continuing problem with the destruction of villages and burial places of indigenous people. An archaeological project administered by the Creek Nation East of the Mississippi is an example of a native group interested in protecting and preserving these cultural resources. Looting of a Creek burial in Talladega County, Alabama, prompted assessment of the burial grounds and determination of means to protect them. This involvement led the Creek nation to formulate a larger project to inventory surrounding cultural resources. (45)

Hally, David J. (Georgia) THE INTERPRETIVE POTENTIAL OF POTTERY FROM DOMESTIC CONTEXTS Large quantities of sherd refuse and whole and partial pottery vessels have been recovered from three domestic structures excavated at a proto-historic site in northwest Georgia. Analysis of this pottery has focused on questions addressed in recently published ethnographic studies of pottery use and discard. The results of this analysis—which include identification of vessel function and estimates of number of vessels broken, differential rates of vessel breakage, duration of structure occupancy and amount of post-discard refuse movement—are described. The value of this kind of analysis in reconstructing past life ways is discussed. (35)

Halstead, Paul (Cambridge) and John O'Shea (Oxford) A FRIEND IN NEED IS A FRIEND INDEED: SOCIAL STORAGE AND THE ORIGINS OF SOCIAL RANKING A normative bias in ethnographic observation has led to a frequent misinterpretation of the adaptive functioning of exchange systems, particularly with reference to the exchange of foodstuffs for status items. This paper suggests that such conversions are a crucial component of exchange in sedentary societies, providing a means of 'indirect storage' of perishable foodstuffs as a defense against periodic failure. The role of indirect storage in the development of ranked society is illustrated with reference to the formation of the Palace system in second millennium Crete. (12)

Hamblin, Nancy L. (Arizona) THE ROLE OF MARINE RESOURCES IN THE MAYAN ECONOMY: A CASE STUDY FROM COZUMEL, MEXICO That the Maya made extensive use of marine resources is not a new idea, but data to support this assertion have been relatively scarce. Collection of fauna from eight sites on the island of Cozumel has yielded over 8,600 specimens representing some 965 reef fishes, sharks, stingrays, crabs, and sea turtles. These animals ranked first in the prehistoric economy, surpassing even mammals in numerical importance. Although marine fauna were primarily of dietary significance, the present data also suggest utilization as artifacts, especially in ceremonial contexts. Interpretations of fishing techniques, exploitation of micro-environmental zones, and food preparation practices are also discussed. (56)

Hamlin, Christopher (Pennsylvania) SATELLITE REMOTE SENSING OF THE MARV DASHT PLAIN Landsat data covering the Marv Dasht plain for May and September 1976 have been analyzed using machine processing to provide information on the distribution of certain contemporary land use categories. These include crop type, hydrology, soils, settlements, seasonality, and the harvest. An image analysis system was used to produce composite maps and related statistics for these classes of phenomena. The study was undertaken in conjunction with "ground truth" data obtained by the Malayan Project, which are described. Ways in which remote sensed data may contribute to archaeological research are summarized. (7)

Hammond, Gawain and Norman Hammond (Rutgers) CHILD'S PLAY: A DISTORTING FACTOR IN ARCHAEOLOGICAL DISTRIBUTIONS Recent work on modern artifact distributions in vacant

lots and living sites has shown the relationships between activity and archaeologically observed patterns of materials. The systemic-archaeological context sequence can however be complicated in some ways, the example taken here being that of children's play recycling 'archaeological' materials briefly into a systemic-archaeological-systemic-archaeological series of contexts. The results of experiments carried out with artificially constructed middens and observed child-play activities are described and analyzed. (35)

Hammond, Norman (Rutgers) CUELLO EXCAVATIONS 1980: AN OVERVIEW Cuello, a lowland Maya site, has yielded radiocarbon dates back to 2000 B.C. and preserved architecture, burials and occupation deposits. Excavations in 1980 have greatly extended the area of Early Formative occupation exposed to the north and south of the major excavation in 1978-79, and have provided a larger sample of ceramic, lithic and ecological evidence for description and analysis of a stratified site of this period. This brief summary of the excavation results introduces the specialized papers in this symposium. (32)

Hammond, Norman (see Hammond, Gawain) (35)

Hanks, Herrick E. and Goff, Linda (Bureau of Land Management) ENERGY & ARCHAEOLOGY—BOOM OR BUST?: A BLM PERSPECTIVE Increased energy-related activities on the public lands and effective cultural resource management goals need not be in conflict. The entire archaeological profession has the opportunity to work together toward achieving its goals, meet the demands of energy interests, as well as maintain the integrity of the nation's cultural resources. (44)

Hansell, Pat (see Ranere, Anthony) (15)

Hansell, Patricia and John Adams (Temple) THE APPLICATION OF SEDIMENT ANALYSIS TO CULTURAL DEPOSITS Grain size analysis has been utilized in reconstructing depositional environments. Such analyses are based on log-normal grain size distributions and describe naturally transported sediments. Material that has been artificially modified, i.e., by human activity, however, may better be described in terms of Rosin's law of crushing. This paper reports tests of this hypothesis using sediments from a coastal shell midden of clear cultural origin and of questionable origin. (5)

Hantman, Jeffrey (see Upham, Steadman) (36)

Harbottle, Garman (see Bishop, Ronald L.) (56)

Hardy, Kathryn D., Patricia R. Plante, and Stephen Plog (Virginia) THE STRUCTURE OF PREHISTORIC SOUTHWESTERN U.S. CERAMIC EXCHANGE SYSTEMS: A BLACK MESA CASE STUDY It recently had been suggested that the exchange of black-on-red ceramics in the Southwestern U.S. occurred over broad areas and was controlled by elite or high-status individuals. Further, it has been suggested that as a result, rewards occur in large frequencies only at sites with great kivas or at local centers. This hypothesis is tested using ceramic information from several hundred sites in a 50 sq. mi. survey area on Black Mesa in northeastern Arizona. (26)

Harlan, Annita (see Van Asdall, Willard) (59)

Harlan, Annita (see Miksicek, Charles H.) (59)

Harrison, Peter D. (MARI) THE PILOT SETTLEMENT STUDY OF THE PULLTROUSER PROJECT This pilot settlement study reports the results of mapping of a small, well-defined site, in direct association with raised fields in the bajo complex called Pulltrouser Swamp, in northern Belize. The significance of the site location and details of site form are examined. This small community has been named *Kokeal*. To the south lies a separate enclave, which is possibly restricted to Late Preclassic occupation. Although beyond the objectives of the pilot program some preliminary data are presented on the site distribution around the bajo complex as a whole. (8)

Hartman, Nicholas (see Fleming, Stuart) (52)

Hartmann, Nicholas (University Museum Pennsylvania) and Diane Z. Chase (Pennsylvania) MICROSCOPIC ANALYSIS OF OBSIDIAN FROM SANTA RITA Occupational debris from Postclassic contexts within the site of Santa Rita in northern Belize includes a group of obsidian blades and bladelets. Examination of the working edges of these tools, using both low-power optical microscopy and an SEM, reveals coherent patterns of striation and of micro-chipping. Analysis of these patterns clarifies the place of this group of tools in the general lithic tool-kit of

the site; further experiments will provide more specific information on the materials that were being worked. (52)

Haselgrove, Colin C. (Durham) **THE SOCIO-ECONOMIC CONTEXT OF POLITICAL CENTRALIZATION IN LATE IRON AGE BRITAIN** The development of centralized polities in southeastern England, during a period of intense trade with the Roman Empire, is considered here as a possible instance of the elaboration of a prestige goods system at the periphery of an expansive state society. Various methodological problems implicit in testing the development model proposed are discussed, and analyses of settlement and funerary data are presented in an attempt to establish the existence of ranking categories, political ties and changes in the production and circulation prestige items and export materials predicted by the model. (1)

Hassan, Fekri A. (Washington State), Anthony F. Drake (Washington State), and Hani Hamroush (Cairo, Egypt) **RAPID FIELD DETERMINATION OF PHOSPHATE MICROQUANTITIES AND ARCHAEOLOGICAL APPLICATIONS** A rapid technique for colorimetric determination of phosphate microgram quantities in archaeological sediments or anthropic soils was designed to permit accurate, quantitative mapping of organic residues. The technique is an invaluable aid for the delineation of site boundaries and detection of activity areas during field operation. As such, the technique provides data input concurrent with field investigations that are useful in selecting the location of test pits and excavations. (25)

Hastings, Wink (Bureau of Land Management) **CULTURAL RESOURCE MANAGEMENT ON THE ALASKA CONTINENTAL SHELF** The Bureau of Land Management's Alaska Outer Continental Shelf Office, through contracts with the University of Alaska Museum, is conducting a series of studies to determine the probability of archaeological site occurrence on the Alaskan OCS. These studies involve the postulation of major sea level stillstands during the Pleistocene and the development of areas of probable species habitat, based on an analysis of relevant paleoenvironmental studies. Using this information, along with a review of archaeological research, delineation of a regional cultural chronology and reconstruction of hunter-gatherer subsistence economies, areas on the OCS are ranked as regions of high, medium, and low probability of archaeological site occurrence and preservation. (10)

Healy, Paul F. and Heather McKillop (Trent) **MOHO CAY, BELIZE: ANCIENT MAYAN MARITIME ADAPTATIONS** Results are presented from preliminary excavations to investigate settlement, trade, and marine resource procurement at Moho Cay, a small island located in the mouth of the Belize River. From ceramic evidence, the site dates to the Classic Period, between 400-800 A.D., with some Late Preclassic and Late Postclassic material. Marine resources are evidenced by a midden of manatee (sea cow) bones associated with broken flint tools, by fish vertebrae, over 20 different species of mollusk and thousands of ceramic "netsinkers." The possibilities for involvement of Moho Cay as a transshipment center in long-distance and regional sea/riverine trade are discussed. (56)

Hellman, James M. and Roger Hoffer (Dayton Museum of Natural History) **ASTRONOMICAL ALIGNMENTS AT THE INCINERATOR SITE—A FORT ANCIENT VILLAGE IN DAYTON, OHIO** Excavation within Incinerator Site's circular stockade has revealed a rigid patterning of concentric rings of houses, storage/trash pits, and burials around a central plaza. The proposals made in this paper are based upon the alignment of the pole structure in the central plaza and its relationship to the position of the sun as viewed from the dwellings, and pole structures found on the west side of the village. The combination of these features is thought to have played a significant part in the village layout and in the scheduling of planting, harvesting, and other cyclical events. (40)

Helgren, David M. (UC-Davis) **LOCATING HUNTER-GATHERER ARCHAEOLOGICAL SITES: A SPATIAL AND PALEOENVIRONMENTAL PARADIGM** A spatial-paleoenvironmental method of site survey is presented as an alternative to traditional site survey procedures. Spatial-environmental site survey is based on the patterning of sites, geomorphic elements, and ultimately, resources. The selection of site locations represents the application of systematic, locative criteria by the society under study. These criteria are discoverable; the landscapes of topographic elements and potential resource locations are reconstructable; and both can be predicted and tested. Methods to operationalize this survey strategy, which include paleolandscaping mapping and applied locational analysis, are described. (35)

Henderson, T. Kathleen (Arizona State) **SOCIAL INTERACTION AND ORGANIZATIONAL CHANGE: A DIACHRONIC PERSPECTIVE** One phenomenon commonly observed during the twelfth through fourteenth centuries in the Plateau Southwest is the aggregation of populations into increasingly nucleated units. Recent research suggests that the trend towards nucleation signaled major changes in the organizational structure of Plateau societies, specifically the

emergence of multilevel decision-making hierarchies. If this hypothesis is valid, concomitant changes are expected in the nature and degree of social exchange and interaction. This expectation arises from the decision-maker's role in collecting and disseminating information and coordinating activities. Evidence relating to this hypothesis is examined and the relationship between social interaction and organizational change is explored. (16)

Henley, Laura A. (Howard) Ann Palkovich (Maryland), and Jonathan Haas (Denver) **THE OTHER SIDE OF ALEXANDRIA: ARCHAEOLOGY IN AN ENDURING BLACK NEIGHBORHOOD** Within the city of Alexandria, Virginia, today are a number of relatively homogeneous black neighborhoods that have considerable historic depth. One of these neighborhoods, known locally as "The Dip," began as a small aggregation of freed slaves at the beginning of the nineteenth century. The focus of the archaeological investigations in the Dip has been to trace the development of black neighborhoods in Alexandria to assess the changing economic and social positions of such groups in relation to the dominant historic white community. The Dip project represents the preliminary stage of an in-depth study of Afro-American neighborhoods in Alexandria. (57)

Henry, Donald O. (Tulsa) **PALEOLITHIC INVESTIGATION IN SOUTHERN JORDAN** The paper summarizes the results of a multidisciplinary investigation of Paleolithic sites in the area of Ras en Naqb, southern Jordan. The investigation resulted in the discovery of 60 sites representing Middle Paleolithic, Upper Paleolithic, Epipaleolithic, Neolithic, and Chalcolithic periods. A number of sites contained stratified, multicomponent occupations in association with well-preserved faunal remains and datable materials. A summary of the cultural and environmental successions of such regions is presented and compared to parallel sequences for other regions of the greater Levant. The research was made possible by a grant (BNS-79-06281) from the National Science Foundation. (30)

Henry, Susan L. (Alexandria Regional Preservation Office) **AN INTEGRATIVE SURVEY STRATEGY FOR RESEARCH AND PRESERVATION** In the absence of a previously formulated research design for an urban archaeological survey, the Alexandria Regional Preservation Office worked through several approaches and formulated a survey strategy based on (1) geomorphological strata, (2) waterways, (3) transportation arteries, (4) impact areas, and (5) ethnohistoric documentation. Survey of selected strata results in data on prehistoric and historic site location and content. Ethnohistoric data yields information on population densities and permits the identification of ethnic neighborhoods and occupational clusters. These data are used to address research questions in addition to providing the basis on which the city's preservation plan is structured. (57)

Hers, Marie-Areti (Tlalpan) **MISION ARQUEOLOGICA BELGA EN LA SIERRA DEL NAYAR: ZONA NORESTE DE HUEJUQUILLA EL ALTO, JALISCO** Como primera etapa en el estudio del extremo meridional de la Sierra Madre Occidental, la Misión Belga ha emprendido desde 1974 varios recorridos y excavaciones en la zona noreste de Huejuquilla el Alto (Jalisco). El estudio del material está todavía en proceso pero por ahora podemos constatar que la población campesina que se estableció allí, a primera vista entre el Clásico y el Postclásico Temprano, vivió en condiciones de gran inseguridad ya que recurrió tanto a las defensas naturales propias a un área montañosa como a fortificaciones. Uno de los atractivos que impulsaron esa ocupación fueron los placeres del río Chapalagana. La cerámica indica una marca de influencia de la cultura mesoamericana del piedemonte oriental. No hemos encontrado indicios de continuidad con los habitantes indígenas actuales sino al contrario datos sugiriendo una ruptura que hubiera ocurrido en el Postclásico Tardío y el siglo XVI. Sin embargo, esa ruptura eventual podría haberse restringido a la zona estudiada. En la zona vecina del río Mezquitic-Bolanos, sondeos preliminares hicieron aparecer restos de una ocupación aparentemente más antigua, claramente relacionada con el horizonte cultural de las tumbas de tiro del Occidente. (41)

Hesse, Brian (Alabama-Birmingham) **YOUNG KILL AS EVIDENCE FOR DOMESTICATION: A RECONSIDERATION OF THE CRITICISM** Recent criticism argues that "young kill" age profiles may not be taken as reliable evidence for herding or domestication thus challenging the traditional picture of southwestern Asian neolithic cultural development. The criticism, which involves evaluation of the age distributions of living ungulate populations and the mortality patterns created by human and non-human predators, concludes that "young kill" could as well be evidence for a strategy of selective hunting. In this paper it is argued that this criticism misuses biological data in the construction of archaeological expectations. The controversy is considered in terms of Zagros late Pleistocene and early Holocene faunal samples. (55)

Hester, Thomas R. (Texas—San Antonio) **THE COLHA PROJECT: INVESTIGATIONS OF AN ANCIENT CHERT TOOL MASS PRODUCTION CENTER IN THE MAYA LOWLANDS** Archaeological research at the site of Colha, Belize in 1979 and 1980 have confirmed the presence of the mass

production, presumably for export, of specialized sets of lithic tools. The earliest evidence of such mass production occurs in the Late Preclassic. While mass production continues throughout the rest of the prehistoric sequence at the site, it is again best represented in the Early Postclassic. The varied investigative techniques utilized to assess this phenomenon, and its regional impact, are described in this paper. (18)

Hirth, Kenn (Kentucky) THE CLASSIC TO EPICLASSIC TRANSITION AT XOCHICALCO, MORELOS This paper examines the nature of Teotihuacan influence in western Morelos and its relationship to the emergence of Xochicalco as a major Epiclassic center in Central Mexico. New data is presented on Xochicalco's chronologic placement and major phase of development. It is suggested that Xochicalco developed on the periphery of strong Teotihuacan contact, eventually growing to compete with the large center toward the end of the Classic. (34)

Hodder, Ian (Cambridge) TYPOLOGY AND EXCHANGE DISTRIBUTIONS Work on the long-distance movement of valuables in prehistory has paid little attention to the typology of the artifacts involved. The nature of the dots on maps must be evaluated before exchange models and fall-off curves can usefully be examined. The first part of the paper demonstrates that different field recovery techniques can change not only the quantity of dots on maps, but also relative proportions and the typology of the artifacts exchanged. With this proviso, the second part of the paper examines typological variation of English Neolithic axes with distance from the source. The typological variation is used in testing competing hypotheses about exchange mechanisms. (26)

Hodges, Richard A. (Sheffield) THE EVOLUTION OF GATEWAY COMMUNITIES: THEIR SOCIO-ECONOMIC IMPLICATIONS An analysis of "gateway communities" that are centers of long-distance trade in ranked societies is presented. It is generally held that we must understand the role of central places/persons to account for the evolution of ranked societies, but in many European circumstances these frontier settlements remain the only direct local where such a redistributive system can be satisfactorily analysed. Production forces, exchange in particular evolving market systems, as well as the morphology of these settlements can be articulated to reconstruct the socioeconomic horizon. (1)

Hoffer, Roger (see Heilman, James M.) (40)

Hoffman, Michael P. (Arkansas) THE ARKANSAS ARCHAEOLOGICAL SURVEY 1967-1980, AN EMIC-ETIC PERSPECTIVE The accomplishments of the Arkansas Archaeological Survey are evaluated from the point of view of a long-time non-Survey Arkansas archaeologist. From its beginning the Survey has had close bonds with the state university department of anthropology. The emergence of the Arkansas Archaeological Survey has diminished the importance of the University Museum in the state's archaeology. The Survey has pioneered many aspects of cultural resource management on the state and national levels. General problems include low publication productivity of some Survey personnel, some lapses of report quality due to time or money concerns, occasional misunderstandings with other agencies, and problems of administrative efficiency. (42)

Hofman, Jack L. (Tennessee) EXPLORING INTRASITE PATTERNING ON HISTORIC SHEEPHERDERS' CAMPS Mapping cultural debris found on historic shepherders camps provides an opportunity to study activity areas and transformational processes on these limited activity sites. If we can develop methods for accurate interpretation and explanation of material distributions which allow cross-reference to firsthand accounts, we may be better equipped to observe, interpret, and explain patterning of prehistoric remains. Hypotheses concerning archaeological remains resulting from known activities, individuals, periods and reasons can be tested. Monitoring of transformational processes on selected shepherd sites should provide useful information about these processes. Such data will also aid our interpretations of prehistoric remains. (4)

Hollen, Thomas (Indiana) CLOISSONNE STYLE VARIABILITY AND ASSOCIATIONS IN WESTERN MESOAMERICA Inlay elaborated lacquer, applied to West Mesoamerican artifacts, is usually of a cloisonné style. Ceramics so decorated are primarily *copa* and *olla* forms. Sets of these vessels, found in burials and caches, are part of a late Classic complex that lasted less than 400 years. Style varieties are regionally distinct but with extensive orthodoxy in symbolic representation; important cultural communality is suggested. Termination of this complex precedes the Postclassic pseudo-cloisonné decorations, which have different associations, distributions, and iconography. (53)

Holley, Gerald A. (Washington) ARCHAEOLOGICAL TAPHONOMY A major aspect in assessing

the potential quality of data produced from archaeological manifestations is the evaluation of the interaction between culturally deposited materials and environmental variables. In order to assess the power of archaeological units to provide sufficient data to address problems, it is necessary to recognize the formation processes of the archaeological context (archaeological taphonomy). This assessment has for the most part been *post hoc*, resulting in ambiguous contributions to our knowledge. It is argued here that archaeological taphonomy must be incorporated into the formative stages of a research design to ensure the generation of sufficient data and to avoid ambiguous analytical conclusions. (5)

Holliday, Vance T. (Colorado) SOME APPLICATIONS OF PEDOLOGY TO ARCHAEOLOGICAL RESEARCH A soil in the pedologic sense forms under the influence of parent material, topography, organisms, time, and climate. The factors of time and climate can be used to date deposits and yield paleoclimatic information. Indicators of the age of a soil include: color of the B horizon; clay mineral alteration and formation; amount of clay translocation; CaCO<sub>3</sub> movement and accumulation; and transformation of certain forms of phosphorous. The influence of climate can be inferred by: amount of organic carbon in the A horizon clay mineral formation and rates of formation; and CaCO<sub>3</sub> rates of accumulation, amounts, and position in the profile. In order to isolate the factors of time and climate the influence of the other factors must be known. Pedologic information integrated with other kinds of data from an archaeological project has the potential for making a considerable contribution to the reconstruction of site history. (5)

Holloway, Richard G. (Texas A&M) POLLEN AND PLANT MACROFOSSIL ANALYSIS OF SITE 49SIT119, SOUTHEAST ALASKA Two pollen columns were collected from the Hidden Falls Archaeological site (49SIT119), Southeast Alaska, and several muskegs were sampled from surrounding areas in order to record changes in the vegetation brought about by cultural and environmental factors. The samples from the site are correlated with stratigraphic units and preliminary analysis indicates increases in arboreal pollen frequencies following each occupation. The pollen and plant macrofossil record from site 49SIT119 is compared with the regional pollen and macrofossil record obtained from adjacent muskegs and this data is used in the interpretation of possible climatic and cultural modifications of the environment which may have occurred. (24)

Holm, Olaf (see Netherly, Patricia J.) (19)

Holzhey, C. S., R. B. Daniels (Soil Conservation Service) and J. N. Gundersen (Wichita State) SOIL SURVEY DATA AVAILABLE IN THE UNITED STATES The National Cooperative Soil Survey has mapped about 2/3 of the United States, or 1.43 billion acres. About 35 percent of the Soil Surveys are published; usually on a county basis. The Soil Conservation Service National Soil Survey Laboratory at Lincoln, Nebraska has analytical data on more than 10,000 pedons (soil profiles). The interrelations of soil properties, temperature, and moisture are being analyzed, and summarized by physiography, kind of soil in a series of local and regional generalizations. (38)

Hoopes, John W. (Yale) EVIDENCE OF A PREHISTORIC WATTLE-AND-DAUB STRUCTURE AT THE SITE OF LA GUINEA, GUANACASTE, COSTA RICA Recent excavations at the site of La Guinea, in the Tempisque River Valley, have yielded evidence of an early wattle-and-daub structure of the Middle Polychrome period (A.D. 800-1200). Also found with the structure were several burials of late Middle Polychrome date. The remains at La Guinea are compared with simple structures in Mesoamerica and in the central highlands and Atlantic lowlands of eastern Costa Rica. (2)

House, John H. (Arkansas Arch. Survey) EVOLUTION OF COMPLEX SOCIETY IN EAST-CENTRAL ARKANSAS: AN OVERVIEW OF ENVIRONMENTS AND REGIONAL DATA BASES The 8000 km<sup>2</sup> of the east central Arkansas portion of the Mississippi Valley contains a diversity of environments, ranging from active floodplains to relict Pleistocene terraces. The archaeological record of Native American societies in this area in the A.D. 500-1500 interval exhibits striking contrasts in settlement pattern between regions and through time. Projected research on the topic of the evolution of complex chiefdom-level societies proposes to treat environment as a variable in analyzing contrasting late prehistoric developmental sequences in this portion of the Valley. (42)

Hsue, Tien Shaing (see DuBois, Robert L.) (11)

Hudson, Charles M. (see DePratter, Chester B.) (61)

Huggins, Rob and John Weymouth (Nebraska) THE ROLE OF MAGNETIC PROSPECTION ON SITES OF THE DOLORES PROGRAM Although magnetic prospecting has been used with a

degree of success at other archaeological sites in the United States, technical improvements have allowed the method to play a more important part in intrasite sampling. At the Dolores Valley, pit structures, firehearths, and activity areas with associated burning show clearly in the magnetic record. Cists and unburned architectural features have more subtle responses. Given the extensive correlation program between the excavation and the magnetic record, it is possible to evaluate the overall success of magnetic surveying in this region and to reexamine computed filtering and graphics techniques to improve the resolution of the method. (31)

Hurst, David C. (see Boice, Nancy) (62)

Hutira, Johna and Jon Joha (Arizona State) WASTED DAYS AND WASTED NIGHTS? THE FEASIBILITY AND UTILITY OF MICROWEAR ANALYSIS The observation of microwear patterns obtained in replication experiments on chipped stone in an archaeological context has been utilized by some researchers in an attempt to define site function. Unfortunately there has been little discussion to date regarding the variability and overlap in edge damage patterns. An experiment utilizing medium- and coarse-grained materials in a variety of tasks is the basis for documenting the range of variations in damage patterns according to edge angle, raw material, and task. The resulting variations and possible problems in application are reported. (37)

Ippolito, John E. (USDA Forest Service) PREDICTIVE MODELING AND FOREST SURVEY IN THE NATIONAL FORESTS OF TEXAS Forest survey is hampered by dense vegetation and thick ground cover, decreasing ground visibility and making topographic identification difficult if not impossible. The reliability of pre-modification reconnaissance or survey is directly proportionate to the size of the area concerned. This paper will explore current methods being used on the National Forests of Texas to alleviate or minimize the effects of these problems on cultural resource management and how these methods fit in with the forest's overall management criteria. (51)

Jacobs, Linda (Oregon) THE BREAKDOWN OF LOWLAND HEGEMONY IN THE HIGHLANDS OF IRAN IN THE MID-SECOND MILLENNIUM, B.C. Survey and excavation in the Kur River Basin, Iran, reveal a marked change in the archaeological record during the second millennium, B.C. Data from excavations at Tal-e Malyan and Darvazeh Tepe, as well as from systematic surface collections, support the author's hypothesis that this change can be attributed to political and military upheavals in Mesopotamia and the Iranian lowlands around 1600 B.C. These upheavals destroyed long-established trade and diplomatic ties between the lowlands and highlands and isolated the highland communities, which consequently became self-sufficient and ingrown. (7)

James, S. E. (see Breternitz, D. A.) (31)

Jarvenpa, Robert (see Brumbach, Helty Jo) (61)

Jefferies, Richard W. (Southern Illinois-Carbondale) THE CARRIER MILLS ARCHAEOLOGICAL PROJECT: ANALYSIS OF PREHISTORIC CULTURAL ADAPTATION DURING THE MIDDLE ARCHAIC IN SOUTHERN ILLINOIS Several sites having extensive midden deposits were recently excavated as part of the Carrier Mills Project. At the Black Earth site (11Sa87), radiocarbon determinations place the earliest intensive occupation at ca. 4000 B.C.; much of the midden deposit can be attributed to a Middle Archaic component. Pedological, faunal, floral, and artifactual data provide insight into the general nature of cultural adaptation during the Middle Archaic. Hypotheses are presented about prehistoric use of the site. (23)

Jelinek, Arthur J. (Arizona) THE CONCEPT OF CONTEMPORANEITY IN ARCHAEOLOGY. We can distinguish several different kinds of contemporaneity in the archaeological record. The evidence necessary to demonstrate each kind, and the implications of each kind for archaeological interpretation, are discussed. It is emphasized that the ability to distinguish between qualitatively distinct kinds of contemporaneity is of fundamental importance in interpreting archaeological evidence of past cultures. (35)

Jeter, Marvin D. (Arkansas Arch. Survey) THE ARCHEOLOGY OF SOUTHEAST ARKANSAS: AN OVERVIEW FOR THE 1980s The known cultural sequence for southeast Arkansas begins during the Dalton period and exhibits an overall trend of gradual differentiation. Ceramic data from late prehistoric sites indicate a "frontier zone" situation, marginal to the Coles Creek-Plaquemine, Mississippian and Caddoan traditions. The research program planned for the 1980s combines intensive studies of the relatively data-rich late prehistoric situations with an opportunistic approach to earlier remains. "Typological thinking" must be replaced or augmented by "population thinking" to explain cultural-behavioral variation, change and stability, here and elsewhere in the Lower Mississippi Valley. (42)

Johnson, William C. and James M. Adovasio (Pittsburgh) FORT ANCIENT ON THE FRONTIER: A VIEW FROM BLUESTONE LAKE, WEST VIRGINIA Excavations and attendant analyses at three single-component, open sites at Bluestone Lake in Summers County, West Virginia indicate the presence of populations exhibiting both marked Feurt Phase Fort Ancient affinities as well as affinities to local Appalachian complexes. Specifically, excavations at 46SU3, 46SU9 and 46SU22 have produced extensive ceramic and lithic assemblages ascribable to the thirteenth century A.D. which reflect both the presence of Feurt Phase Fort Ancient groups as well as indigenous non-Feurt populations. Data suggest that a new Fort Ancient phase representing an amalgamation of Feurt and indigenous Appalachian groups should be defined for this area. This proposed phase is suggested as the probable source for Fort Ancient-derived traits on the upper New River in Virginia. (40)

Johnson, W. C. (see Adovasio, J. M.) (33)

Jones, Christopher and Robert J. Sharer (Pennsylvania) ARCHAEOLOGICAL INVESTIGATIONS IN THE SITE-CORE OF QUIRIGUA, GUATEMALA: 1975-1979 The paper summarizes research at the Classic Maya center of Quirigua, where excavations have revealed the sequence of occupation and construction, together with epigraphic data reflecting dynastic and political events. These investigations indicate that Maya occupation at Quirigua was established by the Early Classic period (ca. A.D. 250-600). During the subsequent Late Classic period (ca. A.D. 600-900), Quirigua emerges as an independent political and economic power. Evidence regarding Quirigua's ancient political and economic roles will be discussed in light of previously proposed functional models. (28)

Jones, Rodger (see Tamplin, Morgan J.) (38)

Kaiser, Timothy (UC-Berkeley) MAXIMIZING BEHAVIORAL INFERENCES FROM NON-DIAGNOSTIC CERAMICS Non-diagnostic ceramics and useful and appropriate research materials. They may increase sample size and help characterize physical properties of the ceramic industry at a site. More importantly, they provide data for constructing "middle and high level" theories. Non-diagnostic ceramics are important because gaining access to resources is one of the factors of ceramic production; it can be seen as a microcosmic expression of the larger mode of production. This theme is developed, using data from the Neolithic site of Selevac, Yugoslavia. (14)

Kane, Allen E. (Colorado) DOLORES ARCHAEOLOGICAL PROGRAM: CULTURAL SYSTEMATICS AND INTERSITE PATTERNING Based upon 1978 data, systems of temporal, spatial, and cultural units were constructed to serve as controls and for compatibility in all project studies. The applicability of the cultural scheme, organized as traditions consisting of phase sets, is evaluated. The scheme is refined and expanded based on 1979 data. Using this revision as a framework, intersite patterning in the project area is examined. Prime factors influencing community patterning are characterized as environmental or social; the patterns are considered requisite components of cultural systems. Correspondences to processual environmental and cultural models proposed for the Southwest are evaluated. (31)

Kane, A. E. (see Breternitz, D. A.) (31)

Kane, Donald (see Starna, William) (3)

Keeler, Robert W. (Portland) SOIL ANALYSIS IN NORTH AMERICAN HISTORIC ARCHAEOLOGY The analysis of soils and sediments has been a neglected aspect of research in North American historical archaeology. The main use for soil analysis in historical archaeology lies in its potential for yielding data about the spatial organization of past human societies. Such analysis takes place at three different levels: a macro level of site location and regional settlement patterning, an intermediate level of intrasite activity area mapping, and a micro level of specific feature functional identification. At each of these levels, it is important to gear the analytical techniques used to the problems under investigation. (38)

Keene, Arthur S. and William K. MacDonald (Massachusetts-Amherst) WHATEVER HAPPENED TO THE NEW ARCHAEOLOGY: AN EXAMINATION OF THE RECENT HISTORY OF ARCHAEOLOGICAL APPROACHES IN NORTH AMERICA AND THEIR RELATIONSHIP TO ANTHROPOLOGY In this paper we briefly review some changes in archaeological approaches and orientations in the past several decades. We suggest that the archaeology of the 1970s can be accurately characterized as a return to earlier site- and object-oriented empiricist studies. We further argue that "cultural resource management," rather than being the "new" new archaeology, has greatly hindered the contributions of archaeology to the field of anthropology as a whole. We

suggest that this change can be attributed to the economic organization of CRM archaeology and argue for a restructuring of the organization of research so as to provide the impetus to anthropology relevance in archaeological research. (16)

Kehoe, Alice B. (Marquette) A LESS PROCURUSTEAN PERIODIZATION OF NORTH AMERICAN PREHISTORY Tripartite schemata such as the periodization of North American prehistory into Paleo-, Meso- and Neo-Indian eras are criticized when they seem *a priori* threefold sets typical of the Indo-European cultural tradition. An empirically-derived periodization of North American prehistory is presented instead, emphasizing the development of food production in an American mode based on management of indigenous resources supplemented by imported cultigens; only in the boreal forest and eastern Arctic were there true hunter-gatherers by the late Holocene (last two millennia). Most American societies were stratified by the Protohistoric era (last prehistoric millennium). (16)

Keller, John Esten (USDA Forest Service) SURVEY AND SETTLEMENT IN THE CENTRAL LOUISIANA PINE UPLANDS Archaeological survey in the high pine timber volume uplands of Central Louisiana and Texas indicate that prehistoric sites located in these areas are almost entirely low-density lithic scatters. Furthermore, our survey indicates that such sites are almost always completely random in their placement and cannot generally be located by standard archaeological survey technique prior to timber cutting. Immediately after cutting these sites can be located and more readily interpreted. Our studies further indicate that sites in these areas are only minimally disturbed by clearcutting and subsequent regeneration in which erosion control is stressed. (51)

Kelley, Ellen A. (see Kelley, J. Charles) (53)

Kelley, J. Charles and Ellen A. Kelley (Sul Ross) THE CEREMONIAL CENTER CONCEPT IN CHALCHIHUITES CULTURE, ZACATECAS, MEXICO Major excavations at the putative ceremonial center of Alta Vista, Chalchihuites, have led to reexamination of the ceremonial center concept. A model for the ceremonial center concept applicable to the northwestern sub-periphery of the Mesoamerican World System is proposed. This model is compared to orthodox conceptualizations of the ceremonial center in the Mesoamerican core area; possible applications of the model to southwestern centers such as Casas Grandes, Snaketown and the Chaco Canyon are discussed. (53)

Kelley, Jane H. (Calgary) THE 1979 FIELD SEASON AT CIHUATAN, NORTH CENTRAL EL SALVADOR The 1979 season at Cihuatán centered on the Cerro de San Dieguito, a non-elite residential sector some .5 km. from the Western Ceremonial Center. Main sub-projects were excavation of structures in this sector, creating a master mapping system for the site, and collecting modern and archaeological botanical information. Speculations are raised concerning the large spatial extent of Cihuatán, population levels, the degree of economic specialization, the appearance of the non-elite zone at the time of occupation and crops to be considered in a commercial agriculture hypothesis. (59)

Kelly, Robert L. (New Mexico) INTRA-SETTLEMENT PATTERN VARIATION, ITS RECOGNITION AND SIGNIFICANCE: A CASE EXAMPLE FROM HISTORIC SHEEP CAMPS IN WYOMING The study of prehistoric settlement-subsistence strategies is a focal point of archaeological research. Most projects reconstruct a single, gross settlement-subsistence system, however, where variability within this system is assumed to be unimportant in understanding the reconstructed lifeway. This is an erroneous notion, and an understanding of this variability will be of more value to anthropology now than the documentation of a general model of lifeways. Using data from historic shepherd camps, the case is warranted that (a) a great deal of year-to-year variation exists within a single settlement-subsistence strategy, (b) this variability can influence about factors which are important in conditioning a group's movement within a region, (c) archaeologists might be able to implement research strategies to make this variability visible. (4)

Kennedy, Nedenia C. (Western Michigan) OPENING THE FRONTIER AT PLAYA DE LOS MUERTOS The isolation and definition of three ceramic complexes suggest that the site of Playa de los Muertos in Honduras was occupied continuously from approximately 900 B.C. to 300 B.C. Following a review of this tradition and the comparative evidence, it is argued that formative occupations in western Honduras (and the Southeastern Frontier) were neither as retarded nor as peripheral as has often been implied in the literature. In conclusion, the origins of Mesoamerican civilization are reappraised with reference to this position, and to a general model of cultural development in the New World tropics. (39)

Kent, Susan (Washington State) STRUCTURALISM AND ARCHAEOLOGY THE UNDERSTANDING OF ACTIVITY AREA USAGE Ethnoarchaeological research among Navajos, Chicanos, and Anglo-

Americans has demonstrated that the assumptions archaeologists commonly employ concerning activity area usage best fit the spatial patterning of their own culture. Activity areas are not universally sex specific or monofunctional. In an attempt to go beyond mere description, and to understand activity area usage, a structural model was formulated. The model, which still is preliminary, allows an archaeologist to extrapolate different kinds of information hitherto unattainable. Archaeologists need not be limited to describing cultural material and behavior, but can investigate such abstract cultural phenomena as sex roles, individualism, specialization, and culture change. (61)

Kerrigan, James F. (Pennsylvania) A STUDY OF THE ARCHAEOLOGICAL RECORD Analyses of prehistoric settlement patterns rely on accurate reconstruction of criteria by which prehistoric people organized their use of a region. To overcome the fact that the primary source of evidence for prehistoric settlement patterns (i.e. the archaeological record) is incomplete, a method is proposed that indicates those criteria and the degree of incompleteness of the archaeological record. The method uses linear programming and post-optimal variations to achieve results and has been applied to the 9th-4th millennia B.P. prehistory of Northern Ireland. (16)

King, Thomas F. (Advisory Council on Historic Preservation) RESOURCE PROTECTION AND THE STATE PLAN: A PROGRAMMATIC RELATIONSHIP Increasing sophistication of federal agencies and State Historic Preservation Officers makes it possible for the Advisory Council on Historic Preservation to substitute "programmatic" protection of historic properties, including archaeological sites, for case-by-case compliance with the historic preservation authorities. The potential exists for such arrangements to be linked to State Historic Preservation Plans, which could give each state an integrated, coordinated, archaeological research and preservation program. State plans are not yet sophisticated enough to allow such linkage, but directions for development can be recognized and followed. (9)

King, Thomas J., Jr. (Land and Water Resources Service) THE ROLES OF THE AGENCY ARCHAEOLOGIST IN MANAGING LARGE MITIGATION PROGRAMS The roles of the agency archaeologist in federal contract archaeology are discussed. It is pointed out that a disparity of perception of these roles exists, with the contract archaeologist often seeing only a portion of the roles performed by the agency archaeologist. Some of these roles include archetypes such as the contract monitor, the "wailing wall," the "golden goose," the research evaluator, and the management analyst. It is argued that development of a consensus formative view of such roles is essential due to the massive impact on the discipline of large mitigation programs, programs which are often managed to some degree by agency archaeologists. Suggestions for achieving such a consensus are offered. (62)

Klein, Terry H. (Alexandria Regional Preservation Office) MANAGEMENT OF THE PAST: BALANCING SCIENTIFIC AND COMMUNITY NEEDS. There is a need to preserve and manage archaeological resources of Alexandria for research and public enjoyment. This need can be met through development and implementation of an archaeological preservation plan. Using data from a systematic archival and archaeological survey, the plan integrates ideal research and preservation needs with real-world situations. The plan is a reference document on how archaeological resources are to be consumed for scientific research, what the archaeologically sensitive areas of the city are, how sites in these areas can be preserved, and how impacts in these areas are to be mitigated. (57)

Kliesert, Anthony L. and Bonnie Kranzer (Southern Illinois) A MODIFIED LINEAR NEAREST NEIGHBOR TECHNIQUE. Nearest neighbor statistics are widely used in archaeological contexts. Linear nearest neighbor is not so commonly employed, and it will be shown that the accepted techniques being used can result in erroneous conclusions. A modified and simpler technique is presented and is demonstrated to avoid the pitfalls of other techniques. A hypothetical case and two real cases, one from Black Mesa, northeastern Arizona and another from the Mimbres Valley, southwestern New Mexico, are provided to demonstrate the effectiveness of this new technique. (36)

Kilinger, Timothy C. (Arkansas Arch. Survey) ASSESSING THE ARKANSAS CONTRACT ARCHAEOLOGY PROGRAM: ITS TRIALS AND TRIBULATIONS, ITS ACCOMPLISHMENTS AND PROSPECTS As an acknowledged leader in the growth and development of cultural resource management in the United States, the Arkansas Archeological Survey has been the focus for informed and uninformed praise and criticism, a result of maintaining a high profile in the profession. The Survey has accrued diverse experiences through its contracts with local, state, and federal government agencies and a variety of private firms. By looking at specific contract projects carried out by the Survey throughout its history, an evaluation of the significance of the Survey is made. (42)

Klymyshyn, Alexandra M. (UC-Santa Barbara) **IN SEARCH OF URBAN ORIGINS.** In discussions of cultural evolution, the rise of urban society has been treated as a major discontinuity. Several causal factors, both internal and external, have been presented in the literature. This paper reexamines the systemic interrelationships among these causal factors in terms of catastrophe theory. The data base for the reexamination includes the models proposed and the supporting evidence used in Mesopotamia and Mesoamerica. The resulting model is then tested in an area where urban society did develop—the Central Andes—and in an area where it did not develop—northwestern South America. (16)

Knight, George C. (Lewis and Clark National Forest/Texas Tech) **BLACKFEET AND BUREAU-CRATS: COMPLYING WITH THE AMERICAN INDIAN RELIGIOUS FREEDOM ACT** Pursuant to the American Indian Religious Freedom Act, the Lewis and Clark National Forest, Montana, is gathering data pertaining to Blackfeet Indian religious activities in the Rocky Mountain Front near the Blackfeet Reservation. By working with traditional Blackfeet people, we are learning of a variety of spiritual practices conducted in the Rockies. Oral histories collected from tribal elders are providing a spiritual geography of the area, and represent a significant addition to the Blackfeet Tribe's historical archives. A program of coordination between the Lewis and Clark National Forest and the Blackfeet Tribe facilitates good management of Blackfeet cultural resources. (45)

Knudson, Ruthann (see Breternitz, D. A.) (31)

Kohler, Timothy A. and Sarah H. Schlanger (Washington State) **SURFICIAL ESTIMATION OF INTRASITE PATTERNING** Surficial data provide the most quickly collectable information about a site, and may be the only data available for most sites in any region. The surficially available types of materials and information (in the Dolores Region) are discussed. For several Dolores Project area sites, surface information is compared with site topography, magnetometer survey results, probabilistic sampling excavation and intensive excavation results. Fruitful techniques for the analysis of surface collection data after calibration with excavation data for estimates of both material and human populations are explored. (31)

Kole, Joseph E. (Ohio State) **BAKUN PERIOD SETTLEMENT PATTERNS** A settlement hierarchy first appears in the Kur River Basin during the Bakun period. A seriation is used to divide the Bakun period into phases; settlement patterns are reconstructed for each phase. Population growth simulations are employed to generate probable settlement patterns resulting from population growth and budding off of daughter communities. These are compared to the reconnection growth and budding off of daughter communities. Several methods from locational analysis are used to determine the effect of factors such as administrative development and craft specialization on settlement size and distribution. (7)

Kornfeld, Marcel (Social Process Research Institute—Santa Barbara) **PLAINS HISTORIC ARCHAEOLOGY: IDENTIFYING ENVIRONMENTAL VARIABILITY OF SETTLEMENT PATTERNING** A sample of over 40 Euroamerican rural sites in Western Powder River Basin, Wyoming, occupied during the past 50 to 75 years is examined. These are grouped into several types: sheepcamps, homesteads, ranches, corrals and hunting cabins, representing the rural settlement system in this region. As the rural settlements are located to exploit the surrounding natural resources, several types of analyses are employed to relate the settlement types to the natural resources present and a pattern of relationships is identified. Propositions explaining this patterning are stated and tested resulting in a preliminary identification of the variables affecting the rural settlement system. (4)

Kosakowsky, Laura (Arizona) **CERAMIC ANALYSIS AT CUELLO, 1980** The ceramic sequence of Swasey (Early Formative), Lopez (Middle Formative), and Cocos (Late Formative) established for northern Belize by Duncan Pring has been confirmed by more recent work at Cuello, but the acquisition of considerably more ceramic data has led to a possible subdivision of the Swasey Complex on the basis of type frequency and technical innovations. The results of detailed ceramic analysis in the 1980 season and its relationship to earlier work are described, together with an assessment of the external contacts of the inhabitants of Cuello indicated by ceramic technology and typology. (32)

Kosse, Alan (Soil Conservation Service) **PHOSPHATE ANALYSIS IN ARCHAEOLOGY: USEFULNESS OF FRACTIONATION METHODS** Soil phosphorus fractionation methods have appeared in the archaeological literature as an aid to interpretation and site survey. Claims for the method have been exaggerated, but it may be that it is of some limited value in specific archaeological contexts. Examples of the application of the method are reviewed; criticism has centered mainly on the validity of interpreting the results in an "absolute" sense. (25)

Kosse, Krisztina (Iowa State) **SETTLEMENT ECOLOGY OF THE KÖRÖS AND LINEAR POTTERY CULTURES IN HUNGARY** The first introduction of agriculture to Europe outside Greece is associated with the southeast European Karanovo-Starcevo-Cris Körös complex and its subsequent spread further north into mid-latitude Europe with the Linear Pottery culture. The distribution areas of the two culture complexes meet and overlap in Hungary, where according to the available evidence the LP culture was first developed. This paper examines the distributions of the Körös and LP settlements in relation to major environmental variables and demonstrates a change from almost total dependence on a- and intrazonal resources to greater reliance on zonal resources in the LP culture. (30)

Kowalski, Jeff Karl (Temple) **A HISTORICAL INTERPRETATION OF THE INSCRIPTIONS OF UXMAL** On a glyphic panel on a cylindrical altar from Uxmal, Emblem Glyphs appear at B2, A4 and B5. These are preceded by nominal glyphs, the first two naming males, the last a female. The first nominal glyph is T668, that of the rain god Chac, and is the name or title of an Uxmal ruler. The T668 rain god glyph also appears on Stela 14, where it names a ruler standing on a bicephalic jaguar throne like that of the House of the Governor, as well as appearing on the Building Y painted capstone and the Ball Court rings. (56)

Kranzer, Bonnie (see Klesert, Anthony L.) (36)

Krass, Dorothy Schlotthauer (Massachusetts-Amherst) **SMALL ARTIFACTS AND WINDBLOWN SITES** Unless we can recognize the actions of naturally caused post-depositional disturbances on assemblages of small things—flakes, fragments, sherds, etc.—we are in danger of assuming only cultural processes affect their distribution. Post-depositional, natural actions are investigable, and their effects on artifacts should be predictable. One such investigation—of the ability of strong winds to move and to mark stone artifacts—is described as an example of how archaeologists can improve the observation and interpretation of their data. (5)

Krause, George J. (Colorado State) **ARCHAEOMAGNETIC METHODS: A COMPARISON BETWEEN SUN COMPASS AND MAGNETIC COMPASS MEASUREMENTS** Directional control obtained by using a hand-held magnetic compass may be subject to error due to local magnetic anomalies. This influence may in turn affect the accuracy of archaeomagnetic paleopole determinations. As an alternative, use of a sun compass is suggested. Three test firepits/hearths were fired, with 72 oriented specimens collected: 12 from the rim and 12 from the floor of each firepit. Aside from the expected random parallax/observational errors, detectable non-random differences in values measured with both compasses indicate the possible involvement of small-scale magnetic influences. (11)

Lackey, Louana M. (American) **CHERRY BLOSSOMS, PRESIDENTS' PLATES, AND CHI WARI: SOUVENIR COLLECTING IN WASHINGTON, D.C.** From observations made of souvenir collecting activities among tourists visiting Washington, D.C., as well as among members of the Armed Services, the Department of State, the Peace Corps, and fellow anthropologists, it is posited that this practice is a cultural universal. Archaeologists have long termed temporal misfits among their finds as "heirlooms," while spatial misfits are termed "exotic," or "trade goods." In the light of the present hypothesis, it is suggested that some of these latter items might more properly be identified as souvenirs. (13)

Lange, Frederick W. (Illinois) **PACIFIC COASTAL CERAMICS IN HIGHLAND COSTA RICAN MORTUARY CONTEXTS: COMMERCE OR RITUAL?** For many decades ceramics manufactured on the Pacific coast of Costa Rica have been recovered from mortuary contexts in the Central Valley and on the Atlantic lowlands of the country. These vessels represent four time periods covering at least 1100 years (A.D. 400–1500) and have traditionally been interpreted primarily as items of trade. The alternative hypothesis that they were principally ritual offerings is examined in light of contextual, geographical, and comparative data. (2)

Lange, Frederick W. (see Smith, Charles R.) (62)

Larson, Daniel (see Brown, Marley R.) (44)

Lavin, Lucianne (New York) **MICROSCOPIC ANALYSIS OF CRYPTO-CRYSTALLINE SILICA MATERIALS WITHIN AND ADJACENT TO THE DELAWARE RIVER VALLEY WATERSHED** A regional sampling survey of chert-bearing formations in the New York and Middle Atlantic region was conducted as part of a study of prehistoric lithic procurement systems within the lower and middle Delaware River Valley. Chert samples were collected from over eighty localities, representing twenty of the archaeologically relevant formations within the research universe. Laboratory analysis indicates that virtually all of the chert types can be distinguished either macro-

scopically or microscopically. There is evidence that thin-section analysis can distinguish specimens from loci within the outcrop area of a single formation, as well as from loci representing different formations. (43)

Layhe, Robert (Southern Illinois-Carbondale) THE DISTRIBUTION OF PREHISTORIC POPULATION: A LOCATIONAL ANALYSIS Nearest Neighbor Analysis is used to test a theoretical locational model for settlement distribution among the Kayenta Anasazi. Environmental, demographic, and organizational variables are employed to provide partial explanation of settlement system stability and resiliency during periods of colonization, spread, competition, and abandonment. Spatial form and population density are compared to the theoretical expectations of this settlement model. Geographical techniques and their archaeological applications are also evaluated. (36)

Lee, Chung Ho (North Dakota) INTRASITE VARIABILITY AT A MIDDLE MISSOURI VILLAGE SITE: A CASE STUDY AT WHITE BUFFALO ROBE Archaeological excavations in 1978 at this Middle Missouri village site near Stanton, North Dakota were followed by intensive laboratory investigations by a number of specialists. Thus far, over 47,000 sherds, 2000 stone tools, 162,000 flakes, 7700 identifiable faunal remains, 273 bone tools and a number of floral remains have been identified. The paper synthesizes results of in-depth studies by the specialists and discusses spatial and temporal variations, as well as aspects of past human behavior patterns, at the site. (23)

Lee, Sheng-Shyong (see DuBois, Robert L.) (11)

Lees, William B. (Michigan State) ECOLOGY, ECONOMICS, AND SETTLEMENT CHANGE AT LIMERICK PLANTATION, SOUTH CAROLINA The Limerick site, located in tidewater South Carolina, represents the remains of an 18th- and 19th-century rice plantation. Those portions of the Limerick site that were destroyed by construction in 1977 and 1978 are considered. This paper provides an evaluation of how the Limerick settlement changed through time, and attempts an economic explanation of this change. Essentially, the conclusion reached is that the Limerick settlement has undergone three major transformations, which are explained as responses to micro- and macroeconomic changes. (61)

Leigh, Steven R. (see Charles, Douglas K.) (23)

Lentz, David L. (Alabama) THE ARCHAEOLOGICAL INTERPRETATION OF JUNIPER CONES AND SEEDS FOUND IN SALMON RUIN, NEW MEXICO Ethnographic sources for the Southwestern Native Americans have shown that juniper berries were used for food and for medicine, while the seeds were used in the manufacture of certain artifacts. Excavations at Salmon Ruin, an Anasazi Pueblo III site, have provided evidence for the prehistoric use of juniper cones in ceremonies and/or as food in a variety of archaeological contexts, e.g., in several Tower Kliva strata, in eight burial strata, and in numerous trash strata. The archaeological data are discussed in light of the ethnographic information. (54)

LePere, Laura L. (Arizona State) INTER-REGIONAL EXCHANGE OF LITHIC MATERIALS AT CHAVEZ PASS At Chavez Pass, a large site located on the Colorado Plateau in Central Arizona, numerous items of non-local origin occur. This paper focuses on one of these items, chipped stone, and examines differential distributions of these materials at both the central ruin and at sites in the sustaining area. Temporal changes in the importation and use of lithic materials are discussed in relation to the changing organization of the regional exchange network. (54)

Lerner, Shereen A. (Arizona State) REGIONAL INTERACTION AND EXCHANGE: A MODEL FOR CENTRAL ARIZONA Evidence in both the archaeological and ethnographic literature suggests that similarities in the spatial and artifactual patterning of adjacent settlement systems may reflect group social affiliation or intergroup interaction patterns. Previous work in the lower Verde Valley region suggests the area was occupied by both Hohokam and Southern Sinagua peoples. Whether the two groups inhabited the area contemporaneously is not yet known. It is proposed that the lower Verde be considered a boundary zone reflecting different patterns of trade and interaction with surrounding groups. (26)

Leventhal, Richard M. (Harvard) A REEXAMINATION OF STELA CACHES AT COPAN: NEW DATES FOR COPADOR A reexamination of Copan's stela caches combines with recent excavations and hieroglyphic studies to date the polychrome pottery, Copador, to around 740 A.D., near the end of Copan's occupation. Past studies have indicated that Copador was found in apparent association with four dated monuments at Copan. However, a careful examination of the caches and cache chambers of these four monuments clearly indicates that only the cache below Stela M (745 A.D.) may be considered to be in direct association with the dated monument. (39)

Leventhal, R. (see Willey, Gordon R.) (39)

Leventhal, Richard M. (see Beaudry, Marilyn P.) (39)

Levy, Janet E. (Illinois State) INVESTIGATING PREHISTORIC RELIGION: A BRONZE AGE EXAMPLE Several analyses of Danish Bronze Age "ritual hoards" show the close intertwining of social power and ritual power. This intertwining seems to be a general characteristic of ranked or chiefdom-like societies. Further, some of the definitional problems in analyzing "religious" remains from prehistoric time periods are dealt with. (30)

Levy, Richard S. and Eric C. Gibson (Kentucky) LINGUISTIC EVIDENCE FOR THE PREHISTORY OF THE PACIFIC NORTHWEST There is a long-standing tradition in Pacific Northwest prehistory that associates various archaeologically defined cultures and traditions with language families and stocks. Our historical linguistic investigations suggest a rethinking not only of many specific proposals but also of the way in which historical linguistics is used. Our research embraces 27 language families and subfamilies of the Northwest Coast and Plateau culture areas and indicates that linguistic expansions have been limited to five discrete periods. *Wörter und Sachen* studies have allowed us to locate homelands and to reconstruct kinship terminologies for many of the 27 proto-languages. (35)

Lewarch, Dennis E. and Michael J. O'Brien (Nebraska-Lincoln) EFFECT OF SHORT TERM TILLAGE ON AGGREGATE PROVENIENCE ARTIFACT PATTERN Use of plowzone artifactual materials is increasing in response to data requirements of regional analysis, however effects of tillage practices on artifact distribution are poorly understood. An experiment is described in which three spatial patterns of varying artifact size classes and density were created in a grid of one meter squares, tilled, and surface collected. Effects of direction, frequency, and type of tillage are discussed in relation to degree of pattern dispersion, size effect, and differential recovery rates. (5)

Lewarch, Dennis E. (Nebraska-Lincoln) PRELIMINARY DEFINITION OF LATE POSTCLASSIC COMMUNITY PATTERN IN THE COATLAN DEL RIO VALLEY, WESTERN MORELOS Intensive surface collections from eight Late Postclassic sites in the Coatlan del Rio Valley of western Morelos are used to define a series of structural units ranging from limited activity areas to high density household compounds. Patterns in these units are evaluated against hypotheses regarding settlement size, location, and functional complexity. Results suggest that some archaeological assumptions regarding relationships between settlement size and function in complex archaeological systems might require reformulation. (34)

Lewis, Rhoda Owen (Wyoming) OPAL PHYTOLITHS IN ARCHAEOLOGICAL SITES: CURRENT RESEARCH IN THE HIGH PLAINS. Current opal phytolith research in High Plains archaeological sites is producing a wide variety of results, but the information garnered by this research, both positive and negative, is proving to be a valuable contribution to the paleoenvironmental record. While the application of opal phytolith research in archaeological sites is out of the embryo stage, it is still very much in its infancy. It is, therefore, the responsibility of those doing phytolith investigation to develop and experiment with different techniques as well as reporting standard research results. Current and projected investigative techniques, phytolith distributions, and the interpretations of this research are examined in this report. (3)

Liggett, Barbara (Rutgers) DOCUMENTS AS ARTIFACTS IN SEVENTEENTH AND EIGHTEENTH CENTURY PHILADELPHIA In this paper, surviving historic documents are perceived as a class of artifacts and, as such, are reflective of attitudes toward land use, concepts of property, and the intentions of individuals in regard to the land which they owned. An analysis of Philadelphia land records reveals changing ideas concerning land ownership during the seventeenth and eighteenth centuries, especially regarding the basic concepts of land tenure and inheritance and including the concept of voting rights. An understanding of such changing concepts is shown to be of considerable importance in the use of historical documents in urban archaeological research in the city of Philadelphia. (49)

Lightfoot, Kent G. (see Upham, Steadman) (36)

Limon Boyce, Morrison (Mexico) AN ARCHAEOLOGICAL SURVEY OF THE VALLEY OF TEMASCALCINGO, MEXICO, QUERETARO AND MICHOACAN, MEXICO The valley of Temascalcingo was selected for study, because of its geographical position, as a possible link between Central and Western Mexico through the Lerma river drainage basin. Two aspects of this research are discussed: the unique architectural features of monumental sites with Chupicuaro-like ceramics in the northwest part of the valley, and the possibility of an early Postclassic mining site at San Jose Ixtapa. (41)

Limp, W. Frédrick (Arkansas Arch. Survey) CURRENT DIRECTIONS IN COMPUTERIZED DATA MANAGEMENT IN MIDWESTERN ARCHAEOLOGY The pressures of federal and state legislation are encouraging, even requiring, the development of computerized data banks for management of archaeological site data. Independently, but concurrently, theoretical concerns are necessitating the development of research oriented computerized systems. Integration of both resource management and research concerns reduces duplication and enhances the productivity of both orientations. As measures of site "significance" become more critical and sophisticated in their determination, computerized systems will assume an increased role. Within this framework of concerns, current archaeological computerized data management in the Midwest is discussed. (6)

Lincoln, Thomas R. (Land and Water Resources Services) CULTURAL RESOURCE CONTRACTING AND THE SMALL BUSINESS SET-ASIDE PROGRAM The Small Business Set-Aside Program was designed to allow capable small businesses to compete against large nonprofit motivated organizations for government contracts. Recently, the program has come under criticism by archaeologists, who believe that it compromises professional archaeological standards. However, this is not the case. Professional standards for government contracts are set by agency archaeologists who work with the archaeological community to maintain a high level of quality. (62)

Lipe, William and Cory Breternitz (Washington State) ACTIVITIES AND ARCHITECTURE: ANALYSIS OF VARIABILITY IN DOLORES AREA STRUCTURES During the period A.D. 850-950, Dolores area pit and surface structures display both synchronic variability and diachronic change. In particular, by the end of this period, pithouses become kivas largely devoted to ceremonial and male activities, while domiciliary activities such as food preparation become largely confined to surface structures. Using preliminary data from the Dolores Archaeological Program, we examine patterns of variability and change with regard to hypotheses of differential availability of building materials, conflicts with scheduling of subsistence activities, accommodation to demographic flux, and relationships to change in socioeconomic organization. In particular, hypotheses of Gillespie (1976) regarding organizational change are examined. (31)

Lopinot, Neal H. (Southern Illinois-Carbondale) PALEOETHNOBOTANICAL ANALYSES OF COLUMN SAMPLES FROM A DEEP MIDDEN SITE IN SOUTHERN ILLINOIS Results are presented for 54 flotation samples from Middle Archaic and Crab Orchard (Woodland) Tradition levels at Sa 87a, Carrier Mills Archaeological District. Implications of nut, seed and wood analyses will be discussed in light of subsistence and settlement. (33)

Lovick, Steven K. (North Dakota) INTRASITE VARIABILITY THROUGH LITHIC ANALYSIS Lithic analysis was conducted on a Middle Missouri village site in North Dakota (White Buffalo Robe Village 32ME7) with the goal of evaluating intrasite variation in the analytical dimensions of (1) function, (2) technology, (3) systemic context, (4) style. A number of multivariate analyses were conducted with the goal of evaluating these dimensions. Cross-tabulation with multiple control variables was used to measure variation by archaeological context. Multiple discriminant analysis, cluster analysis and factor analysis were used to measure differences and similarities in stylistic variation. (37)

Loy, Thomas H. (British Columbia Provincial Museum) INDIAN AND ARCHAEOLOGIST RELATIONS AND POLICY IN BRITISH COLUMBIA During the past 10 years archaeologists in British Columbia have achieved a close and successful working relationship with native people in the province. Through a process of dialogue and experience, what began as personal ethics has now been adopted as policy. Indian bands are involved directly in cultural heritage projects at both the working and decision making levels. Policies which affect both field research and museums ensure that the interests of both Indian bands and archaeologists are met to their mutual benefit. (45)

Luedtke, Barbara (Massachusetts-Boston) NEUTRON ACTIVATION ANALYSIS OF MASSACHUSETTS VOLCANICS Fine-grained sedimentary silicates are lacking in eastern Massachusetts, and prehistoric inhabitants of the area used primarily the locally abundant, although often intractable, volcanic and metamorphic rocks for stone tools. This paper presents the results of a pilot study exploring the possibility of discriminating between different volcanic materials on the basis of their trace element compositions. These materials present many problems for trace element analysis, but preliminary results are promising. It is especially desirable to make such discriminations because the very close spacings of sources in eastern Massachusetts may allow the determination of characteristics of prehistoric territories. (43)

Lundberg, Emily R. and Linda Sickler Robinson (US Virgin Islands) EARLY ADAPTIVE TRENDS IN THE ISLAND ENVIRONMENT: A STUDY FROM ST. THOMAS The island coastal adaptation and

marine resource use evidenced during the preceramic period in the Virgin Islands is discussed, with reference to recent investigations of three preceramic sites on St. Thomas. These localities are compared in terms of mollusk utilization, stone tool manufacture and use, and attributes of the environmental setting. The resource exploitation patterns are contrasted with those identified for early pottery-bearing sites. Comparison is made to similar preceramic sites on adjacent islands and to early coastal manifestations on the mainland to the south. (15)

Lynch, Keith and Sarah Gehlert (Missouri) DEMOGRAPHIC ANALYSIS AND ARCHAEOLOGICAL STUDIES OF EXTINCT COMMUNITIES IN COASTAL GUATEMALA Life tables have been constructed for several colonial communities in the Escuintla and Santa Rosa departments of Guatemala. Data have been derived from manuscripts at the Archivo General de Centro America and the University of Missouri Museum of Anthropology excavations at the sites of Unul and Szamiepuay. In this paper, an evaluation is made of the appropriateness of stationary life tables in demographic analysis and in the archaeological study of these communities of southern Guatemala. (56)

Lynch, Mark (Southern Illinois-Carbondale) WOODLAND SETTLEMENT PATTERNS IN SOUTHERN ILLINOIS Several Woodland period settlement/subsistence models have been proposed for southern Illinois. Most call for a seasonal movement of populations between the area's two major environmental zones: the glacial till plain and the Shawnee Hills. Archaeological survey was conducted in an area just north of the Shawnee Hills along the Saline River to test these models. Results support the inference of year-round occupation along the Saline River, rather than seasonal movements between environmental zones. (23)

Lynott, Mark J. (National Park Service) A PRELIMINARY REPORT OF INVESTIGATIONS AT THE GOOSENECK SITE CARTER COUNTY, MISSOURI The Gooseneck Site (23CT54) is a Mississippian occupation on the Current River in the eastern Ozarks. An extensive T-2 habitation area and a rich midden life on the edge and slope of the terrace. Ceramics are similar to Developmental Mississippian wares in the central Mississippi Valley, and thermoluminescence dating is being used to test this temporal placement. Electromagnetic survey of the terrace, employed to detect subsurface features and minimize the impact of extensive testing, suggests presence of habitation structures. Verification through testing is needed. Preliminary description and interpretations are presented for the site's Mississippian occupation, and for the Current River Valley. (23)

MacDonald, William K. (see Keene, Arthur) (16)

Madden, Lou and Ward Weakly (Land and Water Resources Services) THE DOLORES PROJECT IN HISTORICAL PERSPECTIVE In 1961 the Bureau of Reclamation began planning the Dolores Project to provide irrigation water in Southwestern Colorado. Congress authorized the project in 1968, cultural resource compliance studies began in 1972, and the mitigation contract was awarded to the University of Colorado in June, 1978. The Dolores Archaeological Program is one of the largest federal mitigation programs ever undertaken. Its development illustrates how the many concerns of cultural resource management can be integrated with the needs of both the archaeological profession and a major federal construction agency. The program's history and philosophy are discussed, with an archaeological perspective on its significance. (31)

Mallory, John K. (Penn State) MODELING THE PLACE OF PROTEIN IN A PRE-COLUMBIAN SUBSISTENCE SYSTEM This paper presents a quantified examination of the diet of a prehistoric complex society in highland Mexico, with special attention to protein availability, quality, and requirements within a population. The protein content of a nutritional system based primarily on intensive corn and bean cultivation is evaluated, along with probable protein supplements in the form of wild and domestic faunal resources. The hypothesis that protein may have been a limiting item in such diets is tested, and the results of that test are applied to arguments postulating that warfare, human sacrifice, and cannibalism were adaptive responses to protein shortage. (34)

Marca, Paul (see Netherly, Patricia J.) (19)

Marcos, Jorge G., Colin McEwan, and Presley Norton (Museo Antropológico del Banco Central del Ecuador) RECENT FIELD RESEARCH ON THE CENTRAL COAST OF ECUADOR Recent field work undertaken in southern Manabí Province and on the longest continuous stratigraphic sequence so far encountered in Ecuador is described and the implications of this are discussed. The evidence for markedly contrasting settlement patterns in two mainland valley systems is presented. The Santa Elena Peninsula is now placed in perspective as an area marginal to the mainstream of early cultural developments in the tropical lowlands of coastal Ecuador. The discovery of extensive and well-preserved late pre-contact Manteno settlement corroborates Spanish ethnohistorical accounts. (19)



Marcos, Jorge (see Netherly, Patricia J.) (19)

Marks, Alan, Gordon Bronitsky, and Cindy Burleson (Texas-Permian Basin) PRAISE THE LORD AND COMPARE THE DATA: MATERIAL CULTURE OF RELIGION Twenty Baptist churches in West Texas are examined in terms of material culture items and informant interviews. The differences among churches are first analyzed in terms of the material culture; these differences are then contrasted to informant information. A general assessment of the relative efficacy of material culture in indicating ethnic and class differences suggests certain items and patterns may be more reliable indices of ethnicity and class than are informant data. The relevance of this research to the archaeological study of ethnicity is then discussed. (13)

Marr, Currie D. (see Starna, William A.) (3)

Marshall, Sydne B. (Columbia) DESCRIPTIVE ARTIFACT CATEGORIES AND IMPLIED FUNCTION: A PROBLEM IN ARCHAEOLOGICAL SEMANTICS Categories used to describe artifact form often have connotations of functional association. Such implications appear to facilitate transition from description of form to interpretation of function. Wear pattern analysis of the Shawnee-Minisink Paleoindian assemblage shows that the range of tool function must be demonstrated by analysis rather than implied by choice of category label. The morphological variability of the Shawnee-Minisink Paleoindian assemblage exceeds that of exhibited functional variability, suggesting that original typological goals that resulted in organizing data into descriptive types must be foremost when proceeding to the next interpretive level of artifact and assemblage function. (47)

Martin, Debra L. (see Ravesloot, John) (54)

Maslowski, Robert F. (U.S. Army Corps of Engineers) THE CHILD'S SITE (46MS121): A LATE WOODLAND HAMLET IN MASON COUNTY, WEST VIRGINIA Limited test excavations by the Marshall University Field School at the Childer's site uncovered limestone, siltstone and grit tempered pottery in association with Chesser Notched projectile points. Five radiocarbon dates and the site's relationships with the Woodland Watson, Arstrong and Bick Garden Complexes are discussed. The site location and presence of burials in the occupation area suggest a prototype for the development of early Fort Ancient Village sites. (33)

McBride, Kevin A. (Connecticut) SUBSISTENCE AND SETTLEMENT IN THE LOWER CONNECTICUT RIVER VALLEY: ALTERNATIVE HYPOTHESES Analysis of data gathered in the riverine lowlands of the lower Connecticut River Valley suggests that changes in Archaic-Woodland subsistence and settlement patterns as postulated in traditional models must be reexamined. These new data suggest that while Woodland settlement and subsistence patterns were significantly different than the preceding Archaic patterns, a major shift in focus to coastal resources in the Woodland period did not necessarily occur in southern New England. Rather, an orientation towards large settlements within a more restricted settlement pattern seems to have occurred in the Woodland period. (29)

McCabe, Terry (see Chang, Claudia) (61)

McCarthy, John P. and Stephen H. Graff (Temple) DIFFERENTIAL MORTALITY AND STATUS: IMPLICATIONS FOR ARCHAEOLOGY Economically disadvantaged segments of populations are known to experience higher age-specific mortality in contemporary societies. This study compares and contrasts the mortality profiles of two classes of the South's antebellum population: Black slaves and free whites. The analysis suggests that the slave sample experienced higher age-specific mortality. The utility of this method of analysis for the exploration of the dynamics of social change is examined. Finally, the use of this method as an analytical means of determining the class structure of extinct societies is discussed. (63)

McCartney, Allen P. (Arkansas) ANTHROPOLOGICAL IMPLICATIONS OF BOWHEAD WHALE BONE USE IN THE CANADIAN ARCTIC Archaeological whale bones at Canadian Thule sites were observed and measured in 1978 to describe cultural selection of procurement and use of bowhead whales during the period A.D. 1000-1300. Almost 700 bones measured at nine localities at southern Somerset Island, N.W.T., suggest consistency in (1) using *Balaena mysticetus* in prehistoric times, (2) selecting small (6-8 m) whales from the Davis Strait stock, (3) constructing winter houses of similar size which reflects whale mandible size, (4) modifying crania with a hole through which brains were probably extracted, and (5) symmetrically using right and left bones suggestive that whole skeletons served as house material resources. (55)

McClung de Tapia, Emily (Mexico) PREHISPANIC CULTURAL ECOLOGY IN THE VALLEY OF

TOLUCA In conjunction with the archaeological survey underway in the valley of Toluca, an analysis of the modern and prehistoric ecological conditions of the region has been initiated. Present research includes a description of modern vegetation, which has been substantially modified by large-scale hydraulic works and intensive urbanization during the past four decades. It is argued that prehispanic ecological conditions can only be understood on the basis of archaeological botanical remains—mainly seeds and pollen—recovered from several stratigraphic excavations carried out recently in the area. The long-range goal of this project is the reconstruction and interpretation of subsistence patterns of the prehispanic population, with emphasis on the exploitation of natural resources, many of which are no longer available in the region. (56)

McDonald, Mary M. A. (Western Ontario) A REGIONAL INVESTIGATION OF NEOLITHIC DIFFUSION RATES Evidence from a regional study of mid-Holocene developments in Western Iran seems at odds with recent models depicting a steady, continuous expansion of early farming groups through the Middle East and much of Europe. Close inspection reveals that seemingly similar valleys within the study area display environmental differences marked enough to have affected the spread of the Neolithic. Indeed the archaeological record shows that farming groups settled in the richest valleys in the area as early as the eighth millennium, while similar groups appeared in nearby, less favored valleys only in the fifth millennium B.C. (30)

McEachern, Michael (see Boice, Nancy) (62)

McGuire, Randall H., Robert S. Sternberg, and Robert F. Butler (Arizona) EXCHANGE OF ARCHAEOMAGNETIC INFORMATION BETWEEN THE ARCHAEOLOGIST AND GEOPHYSICIST Most archaeologists are not aware of why geophysicists are interested in archaeomagnetism or what data should be exchanged between them. To construct a paleomagnetic secular variation curve, the geophysicist needs to know the site location, general condition of the archaeomagnetic feature, and peculiarities of the individual samples, and most critically, any and all chronological information pertaining to the firing of the feature. In order to properly evaluate and publish archaeomagnetic results, the archaeologist should receive in return the paleomagnetic direction recorded by the feature, the uncertainty to this direction, and the source of the master curves and the procedures used to infer archaeomagnetic dates. (11)

McGuire, Randall H. (see Sternberg, Robert S.) (11)

McKillop, Heather (see Healy, Paul F.) (56)

McKinney, Charles M. (Interagency Archeological Services) ARCHAEOLOGY, THE LAW, AND AMERICA'S ENERGY IMPERATIVE: MANDATED COMPATIBILITY The watchword for American archaeology over the next decade may be summarized in a single phrase—a substantive shift to responsible reason and practicality. "Fast track" energy development and production as embodied in pending legislation may soon force a "put up or shut up" situation before the archaeological profession. Our profession must be prepared immediately to make hard decisions for its survival through the energy priority years. Working together on an equally "fast planning" process, the archaeological profession within academia, private industry, and state and federal agencies can provide effective resource and program policy management resulting in a recognizable national leadership attitude perceived and accepted by the general public. (44)

McManamon, Francis P. (National Park Service) ARCHAEOLOGICAL SURVEY OF CAPE COD NATIONAL SEASHORE, MASSACHUSETTS During 1979 investigation concentrated on site discovery and sampling the seashore area using a two-stage, stratified random sampling. Stage one data analysis identified five strata. Stage two concentrated upon strata with greatest variation in site types and frequencies. Sample units (200 m x 100 m) served as both investigation and analysis units. Therefore, simple random sampling can be assumed when deriving site population estimates. Historic and prehistoric components estimates indicate a higher frequency than one based upon known sites. Historic sites may occur 75 times more frequently and prehistoric sites 60 times more frequently than would be predicted from known site data. (29)

McManamon, Francis P. (National Park Service) ARTICULATIONS BETWEEN NPS REGIONAL ARCHAEOLOGY PROGRAMS AND STATE PRESERVATIONAL PLANNING Regional archaeology programs of NPS, and other agencies with similar responsibilities, can benefit from state preservation plans in a variety of ways. State plans can: (1) assist in the evaluation of the significance of known resources; (2) help identify areas of potential but undiscovered resources; (3) help rank areas needing archaeological investigation for scheduling and program development; (4) assist the identification of nationally significant resources for inclusion in the NPS system; and, (5) provide information for interpretation and management of resources. A major problem for direct ar-

tication of NPS with state preservation planning is the restriction of major NPS commitments to specific Park Service areas. (9)

McMillan, Barbara A. (Dartmouth) **THE ISOLATION OF LIVING FLOORS FROM COMPACT STRATIGRAPHY** The Early Archaic zone at the Shawnee-Minisink site is used to develop a theoretical and methodological framework for the isolation of occupations embedded in compact stratigraphy. The basic assumption is that reoccupations of a site through time will overlap spatially but not occur in exactly the same positions due to differential criteria of site selection and site abandonment. Methods used include distributions of raw material categories, matching fragments, and projectile point types (in that order). Six living floors are defined, although more knowledge of geological and cultural processes that affect artifact placement is needed. (47)

McNitt, Charles W., Jr. (American) **METHODOLOGY AND CHRONOLOGY AT THE SHAWNEE-MINISINK SITE** The methods employed in excavating the Shawnee-Minisink site in eastern Pennsylvania included an increased emphasis on computer technology which was primarily based on the SELGEM data storage and retrieval system. Three-dimensional coordinates were recorded for over 55,000 artifacts. Based on these data, a chronological sequence was developed covering the 11,000 years of site occupation beginning with Paleoindian and terminating with a A.D. 1500 Late Woodland longhouse. Particularly important is the possible delineation of a hitherto unknown occupation overlying the Paleoindian stratum and characterized by a single collaterally flaked, corner-notched point and point fragments expected to date to 10,000 years ago. (47)

Meltzer, David J. (Washington) **STYLE AND FUNCTION IN A CLASS OF TOOLS** Evolutionary concepts of style and function are presented, and their applicability in the analysis of stone tools is demonstrated. The examination of stylistic and functional variability must be in terms of particular tool classes, since certain factors unique to those classes (e.g., tool "cost," minimal functional requirements, raw material) control that variability. An example using endscrapers is given. The factors are defined, a set of variables describing the tools is created, and the stylistic and functional components are determined. Though endscrapers are commonly seen as having attributes of both style and function, this analysis shows there is no stylistic component. (37)

Merritt, James and Brian Butler (Southern Illinois-Carbondale) **HISTORIC DEBRIS SCATTERS WITHOUT STRUCTURAL REMAINS** Most studies of historic sites have focused on the association of artifacts with adjacent structural remains, usually houses and forts. When historic debris scatters are found not to be associated with structural remains, it becomes necessary to rely on the more unbiased and analytical techniques developed for prehistoric sites. This paper discusses the results of an analysis of the controlled surface collection and excavation of a debris scatter from a rural 19th-century Black community called Lakeview. (5)

Michel, Mark (Archeological Conservancy) **THE ROLE OF THE ARCHEOLOGICAL CONSERVANCY IN SITE PROTECTION** The Archeological Conservancy has been incorporated as a non-profit foundation to assist in the protection of significant archaeological sites in the United States. A brief review of recent and ongoing preservation projects will be given. The means by which the archaeological community can use the services of the Archeological Conservancy will be discussed, as well as some of the mechanisms and pitfalls that have been encountered in protecting sites in "the private sector." (21)

Mielke, P. W. (see Eighmy, J. L.) (11)

Miksicek, Charles (Arizona) **CORN AND OTHER CROPS IN THE EARLY AND MIDDLE FORMATIVE AT CUELLO** The occupation and fill levels at the Cuello site have been sampled by flotation for preserved carbonized plant remains recovered during the seasons 1978-80. Most levels produced plentiful plant macrofossils together with animal bones and small artifacts including shell and jade beads. Among the species so far identified for the Formative are four races of maize, avocado pear, probable cacao, and more than 30 distinct kinds of tropical timbers. The recovery procedures, their drawbacks, and the progress of the research to date are discussed. (32)

Miksicek, Charles H., Annita Harlan, and Willard Van Asdall (Arizona) **ARCHAEOBOTANICAL EVIDENCE FOR POSTCLASSIC SUBSISTENCE AT CIHUATAN** Plant remains recovered by flotation from the Postclassic site of Cihuatlan, north-central El Salvador, have provided insight into the prehistoric environment and subsistence. They also support hypothesis about the economic *raison d'être* of the site. Ethnohistoric data have suggested and archaeological analysis from the 1979 University of Calgary season indicate the distinct possibility of a prehistoric dye and textile industry in the area. Evidence for basic subsistence relying on a maize, squash and beans triad was also recovered as was material indicating a certain utilization of tree crops. (59)

Miksicek, Charles H. (see Van Asdall, Willard) (59)

Milanich, Jerald T. (Florida State Museum) **CONCLUSIONS FROM THE MCKEITHEN SITE, AN EARLY WEEDEN ISLAND MOUND-VILLAGE COMPLEX IN NORTHERN FLORIDA** Sixty weeks of excavations at the McKeithen site focused on investigation of the three mounds, the surrounding horseshoe-shaped village midden, and a central plaza. Data gathered provide conclusions regarding construction, function, and period of use of the three mounds; period of habitation and temporal patterning of the village; origins and functions of Kolomoki-style ceramic effigies and Weeden Island "mortuary" ceramic vessels; social complexity; subsistence; and community layout of the mounds and village relative to solar position. These conclusions are important for our interpretation of other early Weeden Island mound-village complexes in the Southeast. (33)

Miller, Arlene V. (Chicago) **PHYTOLITHS AS INDICATORS OF FARMING TECHNIQUES** The silica content of domestic grasses may distinguish irrigated plants from those that were dry farmed. Phytolith analyses from archaeological sites in Egypt and Central America have produced silica casts of multiple articulated epidermal cells which differ from the more common single celled phytoliths. Plants grown in these regions may have had a greater silica intake than plants that yield single celled phytoliths. A possible explanation is that a warm climate combined with standing water in an irrigated field stimulates chemical processes that free silica from the soil. Thus excess silica is absorbed by the plant. (3)

Miller, Arthur G. (University Museum—Pennsylvania) **ART HISTORICAL IMPLICATIONS OF QUIRIGUA SCULPTURE** Stylistic analysis of Quirigua's monuments associated with the long rule of *Cauac* Sky reveals a fundamental break with the carving traditions of its formidable neighbor to the south, Copan. Further, the sources of Quirigua's Late Classic sculptural style are seen to come from long-established sculptural workshops in the Usumacinta drainage. Elements of monument carving style from Yaxchilan, Salinas de las Nueve Cerros, Cancuen, and Piedras Negras relate directly to the post-9.15.6.14.6 monuments at Quirigua. The implications of this artistic evidence is evaluated in the light of new University Museum data which, along with epigraphic data, suggest a severance of sociopolitical and economic ties with Copan and a reorientation to the north during the Late Classic Period. (28)

Miller, Katharine (Harvard) **CHEMICAL CHARACTERIZATION OF MARINE SHELL: INITIAL EXPERIMENTS** Quite often, marine shell forms an integral part of a complex exchange system (e.g., Rappaport 1967; Wright and Zeda 1977). Heretofore the study of prehistoric shell trade has been limited to a discussion of its context and use and has been unable to explore exchange routes. In an attempt to remedy this situation, trace element analysis of *Mercenaria mercenaria* was undertaken. Preliminary results suggest that chemical characterization will permit marine shell sources to be geographically distinguished. (26)

Miller, Naomi F. (Michigan) **PALEOETHNOBOTANICAL STUDIES AT MALYAN** Changes in settlement pattern on the Marv Dasht Plain during the third millennium B.C. suggest an increase in social complexity. Paleoethnobotanical evidence from Malyan is used to identify and monitor the magnitude and types of changes in elements of the cultural system that articulate with the botanical environment. Vegetation changes, at least partly due to environmental pressures from human activities, are documented. Evidence, or lack thereof, for land use intensification and a widening of the plain's economic network is presented. (7)

Millis, Barbara J. and T. J. Ferguson (Zuni Archaeology Program) **PROCESSES OF ARCHITECTURAL CHANGE: EXAMPLES FROM THE HISTORIC ZUNI FARMING VILLAGES** The Pueblo of Zuni Archaeology Program has recently completed an architectural and historical study of the six historic Zuni farming villages. This paper analyzes and illustrates processes of architectural change by comparing the villages as they existed in the past, as evidenced by historic photographs, maps, and descriptions, with how they exist now, as documented by photogrammetry, intensive archaeological field recording, and dendrochronological studies. Architectural change is demonstrated at the levels of village, locus, and room. A model for the processes of architectural change is presented, based on the three events of construction, reconstruction, and destruction. (54)

Milnc, Leah (see Rice, Don S.) (56)

Minnis, Paul (New Mexico) **EARLY PLANT CULTIVATION IN THE MOGOLLON REGION** Numerous collections of early cultigens have been recovered from sites in the Mogollon region. These remains are critical to the study of primitive cultigen morphology and distribution. Recent work has shown, however, that the temporal placement of these materials and the models employed to explain their development are subject to question. Such models are reevaluated and a more appropriate model using concepts of economic risk in the Mogollon region is presented. (27)

Morse, Pierre, David J. Bernstein, Craig Gerlach (Rhode Island College) **COASTAL ARCHAEOLOGICAL**

OGY IN SOUTHERN NEW ENGLAND: AN EXPERIMENTAL ASSESSMENT OF SOME METHODOLOGICAL ALTERNATIVES FOR THE STUDY OF SHELLMIDDENS A recent research program undertaken at the Greenwich Cove site, Warwick County, Rhode Island, has provided an excellent opportunity to evaluate the alternative strategies generally considered appropriate for coastal sites. Results derived from both field and laboratory analyses provide quantitative data on a variety of excavation and analytical procedures frequently used in the study of shellmiddens. In addition to discussing the retrieval of information regarding the total content of a shell midden, this study also stresses the need for examining the degree of variation among discrete depositional units within a shell midden. (33)

Morris, Elizabeth Ann (Colorado State) and N. Ted Ohr (U.S. Coast Guard) A HISTORIC INDIAN CAMPSITE IN NORTH-CENTRAL COLORADO Uppermost levels of a deeply stratified site on the banks of Boxelder Creek, in the foothills north of Fort Collins, Colorado, contained stone projectile points, a number of trade items and a few horse bones in association with diverse lithic debris and hearths. Numerous bison, deer and antelope bones were recovered some of which indicated butchering activities. Trade items include glass beads, a clay pipe, a gun flint and several metal fragments. Radiocarbon dates of  $210 \pm 95$  B.P. (UGa-813) and  $250 \pm 85$  B.P. (UGa-816) were obtained from hearths. The historic Indian remains are hypothesized to represent post-Dismal River phase Plains Apache occupation. (61)

Morse, Dan F. (Arkansas Arch. Survey) REGIONAL OVERVIEW OF NORTHEAST ARKANSAS The "Jonesboro Station" is responsible for a 30,044 km<sup>2</sup> region containing an estimated 400,000 or more archaeological sites in the northern Mississippi Alluvial Valley. A rich sequence exists from paleoindian through the Historic Dalton remains are particularly plentiful. There is a possible population decline during the Hypsithermal over much of the area and another during early-middle Woodland times. Mississippian begins abruptly by at least A.D. 800 and experiences population nucleation around A.D. 1350-1400. Indian florescence occurs in the sixteenth and seventeenth centuries. The Euro-American frontier is very evident in the early nineteenth century. (42)

Morse, Phyllis A. (Arkansas Arch. Survey) THE PARKIN SITE AND PHASE The Parkin site is a 17 acre late Mississippian and Protohistoric pyramidal mound and village site in northeast Arkansas. It is the largest of 20 known Parkin phase sites and was probably the capitol of Casqui visited by the DeSoto expedition in 1541. Parkin is strategically located below the junction of two rivers, convenient to receive tribute. Sites in the Parkin phase are located on areas of very productive soils and may have supplied food to Parkin. No farmsteads were located and all known sites appear to be fortified, possibly a reaction to increased warfare. (42)

Most, Rachel (Arizona State) AN EXAMINATION OF TECHNOLOGICAL VARIABILITY AND PRODUCTION AS REFLECTED IN LITHIC DEBITAGE: AN EXAMPLE FROM PINEDALE, EAST-CENTRAL ARIZONA Variability in the utilization of certain raw materials, specifically basalt, suggests that certain organizational changes may have occurred in the Pinedale region of east-central Arizona between A.D. 1150 and A.D. 1275. Lithic debitage from a sample of 38 sites is examined to determine whether diversification in lithic production through time existed and if differences in technology and manufacture between certain defined site types can be documented. The work is based on the assumption that varied technologies were implemented to produce functionally different artifact classes and that these distinctions should be reflected in the debitage. (37)

Mountjoy, Joseph B. and Luis M. Torres (North Carolina-Greensboro) THE PRODUCTION AND USE OF PREHISPANIC METAL ARTIFACTS IN THE CENTRAL COASTAL AREA OF JALISCO, MEXICO Recent investigations in the Tomatlan River valley of Jalisco resulted in recovery of 192 metal artifacts, mostly apparently prehispanic. Metallurgical analysis indicates that nearly all are of copper, but silver is also present. Manufacture was by heating and hammering or by casting, and smelting residues indicate it was a local industry. Most artifacts were recovered from house floor trash or midden layers, but some, especially copper rings, were used as burial offerings. The first appearance of artifacts in the area is associated with the expansion of Aztlan culture, perhaps by A.D. 600. (41)

Muller, Jon (Illinois) GENERATION AFTER GENERATION: FORMAL DESCRIPTIVE MODELS IN ARCHAEOLOGY Although the current literature in archaeology often employs the word *style*, little attention has been given to the construction of formal, structural models of this form of behavior. Recent attempts to construct such models for archaeological materials are discussed. The relationship of these formal models to "behaviorist" and so-called "cognitive" theories is also treated. Specific examples of formal, logical models are given. (16)

Murray, Priscilla (Indiana) and Claudia Chang (SUNY-Binghamton) AN ETHNOARCHAEOLOGI-

CAL STUDY OF A CONTEMPORARY HERDERS' SITE IN SOUTHERN GREECE The study of a contemporary pastoral site in the Southern Argolid of Greece has been conducted since 1978. The site is located in a natural limestone sinkhole where there have been Neolithic findings. Contemporary use by herders is evident by the presence of hearths, fold enclosures, and dense artifact disposal. Over a period of two years, we have mapped features and artifact concentrations. In the winter of 1978-1979, actual use of the sinkhole by sheep and goat herders was observed and monitored. The preliminary results are the definition of site formation processes as observed by recording of features and spatial location of material objects and actual ethnographic observation of human and animal activities in the sinkhole. From our data base, we tested the archaeological assumptions that (1) animal husbandry practices and human occupation could be inferred from the distribution of cultural materials used, disposed, or dropped at the site; and (2) artifact concentrations at certain loci were indicative of activity areas where cooking, animal feeding, animal watering, and sheltering actually occurred. (61)

Nagle, Christopher (Smithsonian), William Fitzhugh (Smithsonian), Ralph Allen (Virginia), and Marianne Storey (Virginia) NAA CHARACTERIZATION OF SOAPSTONE SOURCES, AND DORSET ARCHAEOLOGY IN LABRADOR Results of a long-range study examining the geochemical characteristics of soapstone source areas and archaeological specimens from Labrador are presented. At this time, almost 500 specimens have been analyzed, 50 of which are quarry or outcrop samples. The location, character, and variability of outcrops are discussed as a foundation for interpretation of archaeological samples. Patterns of Dorset soapstone procurement in different areas on the Labrador coast are discussed, as are changing patterns through time. Finally, the evidence for interregional population movements and the existence of trade networks is presented. (43)

Nance, L. Roger (see Boice, Nancy) (62)

Napoli, R. P. (see Beidleman, D. Katharine) (57)

Neely, James A. (Texas-Austin) THE BRANCH CONCEPT: A ROSE BY ANY OTHER NAME? The developmental history of the Branch concept is discussed and traced from its probable precursors to the present. It is suggested that the basic concept of the Branch, viewed primarily as a designator of regional variation within the greater Mogollon culture area, is still viable and useful. Pros and cons are presented as to the retention of the term Branch. Specific suggestions are presented for revising the concept to make it more compatible with processual, systemic, or behavioral theoretical orientations. (27)

Neely, Robert B. (Southern Illinois-Carbondale) THE PREHISTORIC COMMUNITY: A THEORETICAL, METHODOLOGICAL, AND COMPARATIVE REGIONAL APPROACH A framework for investigating interaction and exchange networks among contemporaneous archaeological sites is presented. Coefficients derived from several data sets at each site, and analyzed by means of multidimensional scaling procedures, are utilized as the basis for deriving community interaction spheres. An intensive examination of two areas on the Colorado Plateau, the Squaw Point-Cow Mesa area of Southwest Colorado and Black Mesa in Arizona, provides the data base for the investigation of the variation in the development of prehistoric communities through time between these two areas. Changes in the structure and extent of community networks are examined in light of various natural and social environmental factors and the effects they have on the ability of a population to survive. (16)

Neitzel, Jill (see Upham, Steadman) (36)

Nelson, Ben A. (Southern Illinois-Carbondale) AN ETHNOGRAPHIC TEST OF TURNER AND LOFGREN'S VESEL SIZE HYPOTHESIS Turner and Lofgren have proposed that cooking jar volume is determined by the number of individuals for whom food is cooked, and have used variation in cooking jar volume to measure changes in Kayenta Anasazi household size. Petersen has expressed skepticism at the validity of the measure. Volume measurements of over 2,000 vessels from 50 households in a highland Maya village provide an empirical basis for evaluating the Turner and Lofgren hypothesis. Information accompanying the volume measurements permits refinement of both the dependent and independent variables in the Turner and Lofgren equation, as well as consideration of alternative explanations for variation in cooking vessel volume. (61)

Nelson, Margaret C. (UC-Santa Barbara) FORMAL VARIATION OF CHIPPED STONE TOOLS AS A MEASURE OF SUBSISTENCE CHANGE The analysis of chipped stone material from several excavated sites in southwestern New Mexico is tied into the general research goal of identifying and evaluating the factors contributing to changing subsistence focus. This analysis specifically attempts to differentiate plant from animal exploitive tasks through variables of chipped stone

tool material and edge form. Difference in the composition of chipped stone samples is evaluated as an index of differences in general subsistence focus. A temporal shift in reliance of plant versus animal resources is identified for two environmental zones in the study area. (17)

Netherly, Patricia J., Olaf Holm, Jorge Marcos, and Raul Marca (Museo del Banco Central del Ecuador) SURVEY OF THE ARENILLAS VALLEY, EL ORO PROVINCE, ECUADOR Extensive survey and limited test excavations reveal intensive use over several millennia by tropical forest related cultures of a transitional coastal region lying between the humid Guayas River basin and the desert coast of Peru. Maritime contacts via the Jambell estuary with the north and south coasts of the Gulf of Guayaquil seem certain as does contact with highland populations. Survey data suggest both slash-and-burn and irrigation agriculture were present during almost the entire sequence. (19)

Neuman, Robert W. (Louisiana State) THE PERSIMMON: ITS DOCUMENTATION IN THE ARCHAEOLOGY OF EASTERN UNITED STATES The native American persimmon (*Diospyros virginiana*) is a most nutritious fruit, excepting nuts, in its geographical range. Just as important to primitive economies, the persimmon ripens late in the fall and early winter long after all other soft fruits have matured. This paper will discuss the origin of the name "persimmon," the ethnohistoric utilization of the fruit and the wood of the tree upon which it grows, as well as the archaeological documentation of its distribution and chronology in prehistory. (33)

Nicholas, George P. (Franklin Pierce) CRYSTAL QUARTZ AS A PRE-ALTTHERMAL LITHIC RESOURCE IN NORTHERN NEW ENGLAND Crystal quartz, as a significant lithic resource, has been generally omitted from artifact or procurement studies. While crystal quartz appears in assemblages scattered across the Northeast and may, in fact, represent a specific industry, it is especially prevalent in early levels at a number of glacial lake-related sites. It remains the predominant lithic type throughout the deepest levels with other materials noticeably absent. It is suggested that crystal quartz was used as a lithologically acceptable substitute for the cherts expended during initial Paleoindian or early Archaic utilization of the region. (43)

Nicholas, Ilene M (Pennsylvania) A SPATIAL-FUNCTIONAL ANALYSIS OF THE BANESH OCCUPATION AT MALYAN: THE TUV OPERATION The Banesh (ca. 3000 B.C.) occupation of the TUV mound at Malyan consists of three building levels containing structures and debris indicating a variety of cultural activities. This paper addresses the interpretive problems raised by the formation process, cultural and natural, which created the deposit from which archaeological data were recovered. A functional classification of finds and features is discussed and a method of analysis resulting in the functional profile of each building level is presented. (7)

Nickelhoff, Andrew A. (Michigan) PREHISTORIC LITHIC TECHNOLOGY AND SUBSISTENCE IN THE RED RIVER GORGE, KENTUCKY Lithic collections recovered from two Eastern Kentucky rockshelters are discussed. The cultural deposits at these sites span a period of nearly 9,000 years. Functional studies of chipped stone remains generally concentrated on morphological aspects of tools as they related to the tasks performed at the site. In many cases, especially small-scale, short-term occupations, the tool sample is quite small, due to natural and cultural factors (e.g. curation). In such situations, a technological analysis that will reveal as much as possible about the kinds of tools manufactured must be integrated with a functional lithic analysis. (17)

Nickerson, Janet W. (Ohio State) KAFTARI PERIOD HUMAN FIGURINES FROM TAL-E MALYAN, IRAN Study of the 112 Kaftari-period Etamite (ca. 2200-1800 B.C.) human figurine fragments excavated during five field seasons at Tal-e Malyan indicates that the figurines may have been made only to be intentionally destroyed in magical rituals to guard against evil spirits. To investigate this hypothesis, uses of figurines as documented in ancient Near Eastern literary texts in translation will be compared to the Malyan figurines' methods of manufacture as revealed by their breakage patterns, archaeological contexts, and spatial distribution. (7)

Nickerson, John L., Jr. (Ohio State) ANALYSIS OF THE SPATIAL-FUNCTIONAL INTRA-SITE VARIABILITY PRESENT IN THE KAFTARI PERIOD OCCUPATION AT TAL-E MALYAN, IRAN A study of Kaftari period (ca. 2200-1800 B.C.) finds and features from 13 separate excavation operations in five different locations at Tal-e Malyan reveals sufficient diversity to demonstrate spatial-functional intrasite variability for the Kaftari period. A distinct functional profile is constructed for each location. Locational information, functional classification, and depositional context are used to support these profiles, which are then discussed in terms of their meaning for the overall Kaftari occupation at Malyan. (7)

Niemczycki, Mary Ann (SUNY-Buffalo) MATRILOCALITY AND IROQUOIS ARCHAEOLOGY: MYTH

AND REALITY Certain assumptions based on the concept of Iroquoian matrilocality and its presumed effect on the patterning of ceramic attributes have become widely accepted among archaeologists in the Northeast. However, examination of these assumptions in the light of cross-cultural, ethnohistorical and archaeological evidence shows that they frequently fail to fit the reality of the data. The misconceptions fostered by these assumptions pose problems in the analysis of archaeological data and in subsequent attempts to reconstruct the sociopolitical development of the Iroquois. This paper attempts to separate myth from reality in what we can actually assume and suggests what we can, in reality, expect ceramic remains to tell us about the sociopolitical organization of their makers. (35)

Niquette, Charles M. (see Butler, William B.) (44)

Nolan, James L. (Columbia) HOW GREEN WAS MY VALLEY: CULTURE HISTORY AND IRRIGATION ON THE NORTH COAST OF PERU Survey and test excavation in the Lambayeque-Zaña intervalley zone indicates the existence of a previously unrecognized North Coast polity. This Lambayeque state developed in response to Mochica incursion into the zone (A.D. 500-700) and gradually advanced towards the south, influencing the nascent Chimú state (A.D. 700-1300). Despite retrenchment, it retained local sovereignty until the Chimú-Inca entry into the zone, ca. A.D. 1450, just prior to the Spanish Conquest in 1532. Organizational, production, and population models for the Lambayeque-Zaña zone between A.D. 500 and 1550 are developed from the reconstruction of irrigation patterns and settlement patterns. (46)

Norr, Lynette (Illinois) BONE CHEMISTRY AND PREHISTORIC DIET: INITIAL RESULTS FROM COSTA RICA Various problems which arise from attempts to reconstruct prehistoric diet from bone chemical analyses are discussed. Particular attention is given to several recent studies on stable carbon isotope ratios in bone collagen as an indicator of the dietary utilization of either maize or marine foods. The preliminary results of the application of stable isotope and trace element analyses to human bone samples from coastal and inland Costa Rican sites (A.D. 300-1500) are presented. The possibility of diet reconstruction for prehistoric populations whose intake is suspected to have both maize and marine foods is evaluated. (2)

Novick, Andrea L. and Charles E. Cantley (Ohio) PREHISTORIC SITE PATTERNING IN THE HOCKING RIVER VALLEY, OHIO Formulation of a predictive model for Hocking County is discussed. The model integrates site type and location with environmental parameters. Using a site catchment approach, Hocking River sites are compared with sites in the Miami, Little Miami, Scioto, and Muskingum river drainages, and results are presented. Advantages of a regional model for use in management planning of environmental impact studies and archaeological projects are addressed. (23)

O'Brien, Michael (see Lewarch, Dennis E.) (5)

Ohr, N. Ted (see Morris, Elizabeth Ann) (61)

Oliver, José R. (Illinois) QUEBRADA BALERIO: A NEW SALADOID STYLE IN PARIA, VENEZUELA The style has the closest affinities with the Saladoid complexes of Carúpano, Paria and Trinidad as well as the earliest styles in the Caribbean. Its most direct ancestral origins relate to the Middle Orinocoan Saladoid (Ronquín). It was hoped that Balerio would fill the chronological gap (of ca. 900 yrs.) that would connect the Coastal Saladoid with the Orinocoan Saladoid. The style has been relatively dated from ca. 100 B.C. to A.D. 300. The gap, apparently, still remains unfilled. The "jump" from the Orinoco into the Coast still remains unclear. J. M. Cruxent, testing the site in 1974, obtained a conflicting C-14 date of 6760 ± 130 B.P. (#1597 W.S.U.) which prompted the writer to make further research and collect charcoal and shell samples for C-14 analysis. (19)

Orcutt, Janet D. (UCLA) RESPONSES TO FOOD STRESS ON THE PAJARITO PLATEAU: AN ANALYSIS OF PUEBLO SITE LOCATIONS An analysis of pueblo site locations during the Coalition (A.D. 1200-1325) and Classic (A.D. 1325-1600) time periods on the Pajarito Plateau, New Mexico, has shown interesting patterns which may be related to food stress. Using climate as an indication of food stress, it is suggested that the stresses during the two time periods were of different magnitudes. The proposed responses to the stress are diversification of food resources utilized during the Coalition and intensification of agriculture during the Classic. An analysis of site locations by elevation suggests these responses may have occurred. Site catchment analysis is used on a sample of site to better clarify the results of the elevational analysis. (54)

Osborn, Alan J. (Nebraska) COASTAL POPULATION DENSITY AND MARINE RESOURCES: RESOLUTION OF AN ANTHROPOLOGICAL PARADOX Since the early population studies by Mooney and Kroeber, anthropologists have assumed that coastal densities were among the

highest for aboriginal North America. Recent investigations demonstrate that aquatic resources and related exploitative strategies are less than optimal. Resolution of this paradox becomes essential if anthropologists are to gain nomothetic insights into coastal/maritime adaptations. This critical problem is solved if one differentiates between *gross* versus *effective* population density. Once this conflict is resolved, a number of anthropological implications are explored. (50)

O'Shea, John (see Halstead, Paul) (12)

Palles, R. A. (Oklahoma) COLONIAL EXCHANGE SYSTEMS AND THE DECLINE OF PAQUIME Using spatial models of administered market systems and archaeological data from northeastern Sonora, we argue that the Mesoamerican trading town of Paquime declined because it was unable to maintain administrative control of local economies in its hinterland. This failure was due to an inherent weakness of the Mesoamerican trading system on the frontier, such that the Southwestern Indigenes were not drawn into a dependency relationship with Mesoamericans. This model may explain the cyclical pattern of Mesoamerican trading activity in the Southwest. (53)

Palkovich, Ann (see Henley, Laura A.) (57)

Palmer, Patricia G. and Alice E. Tucker (Duke) A SEM SURVEY OF SILICA BODIES AND OTHER ANATOMICAL FEATURES OF GRASS LEAVES The diagnostic value of anatomical features of grass leaf epidermis as viewed with light microscopy has long been known. This paper presents a survey of the diagnostic characters of grass epidermis as observed with scanning electron microscopy (SEM). The technique is applied in the identification of fossil grass cuticles from African lake cores where charred grass fragments are abundant. This method is promising not only for Africa where it can be used to interpret the past vegetational history more clearly, but anywhere there are abundant and well-preserved grass cuticles in the fossil record. (3)

Parrington, Michael (Pennsylvania) SALVAGE ARCHAEOLOGY AT AREA F, INDEPENDENCE NATIONAL HISTORICAL PARK, PHILADELPHIA Recent privy excavations in Area F, Independence National Historical Park, have provided useful information on the social history and standing of the people who discarded their trash on the Area F site in the eighteenth and nineteenth centuries. Preliminary results suggest that when privies went out of use for whatever reason, they were utilized as trash dumping areas by a broad range of social classes. Preliminary research is also being undertaken on the utility of using hydration rate dating techniques on glass from the excavations. Although the results are not yet conclusive, the technique seems to hold some promise. (49)

Parris, David C. (New Jersey State Museum) FAUNAL EVIDENCE OF SEASONAL OCCUPATION OF THE ABBOTT FARM LOCALITY Among approximately 2600 animal bones excavated from the third humus horizon of the Abbott Farm Site, 60 specimens serve as seasonal evidence. The materials include frontal bones of male deer (*Odocoileus virginianus*), juvenile dentitions of deer, plates of sturgeon (*Acipenser sp.*), bones of migratory birds, and specimens of at least three genera of turtles (including *Terrepenne carolina*, *Chrysemys rubriventris*, and probably *Malaclemys terrapin*). Although warm weather occupation is most easily demonstrated, there is good evidence for occupation during various seasons in the lowland portion of the site during Middle Woodland times. (48)

Parry, William J. (Michigan) THE USE OF EDGE MORPHOLOGY IN FUNCTIONAL CLASSIFICATION OF CHIPPED STONE TOOLS A classification of stone tools based on edge morphology is presented. Attributes examined include edge angle, edge shape, edge wear patterns, tool size, and lithic material. Patterns of association and covariation permit definition of tool classes thought to represent generalized functional types. This approach is applied to a fragmentary collection from the Garnsey site, New Mexico, and an "amorphous" surface collection from Negros Island, Philippines. In both cases, tool classes defined by edge morphology show spatial patterning reflecting functional differences between activity areas and between sites. It is analysis of subsistence and settlement systems. (17)

Patch, Diana Craig (Pennsylvania) APPLICATION OF FRESHWATER SHELL IN ARCHAEOLOGICAL RESEARCH Freshwater shell is a common component of some archaeological sites in eastern North America. Intensive study of the species of mollusks from a given site can yield information about specific habitats that will help the archaeologist reconstruct the prehistoric riverine environment adjacent to a site. In addition, an understanding will be gained of collection techniques used by prehistoric Indians to retrieve mollusks as a food source. Shell recovered from the Carlston Annis shellmound in west-central Kentucky is used to illustrate the

quality of data that can be retrieved through analysis of freshwater shell, and show how it can be used to better understand an archaeological site. (5)

Pauli, Gene J. and Anthony N. Zavaleta (Texas Southmost) THE NORTHEASTERN BOUNDARY OF MESOAMERICA: NEW INFORMATION The northeastern boundary of Mesoamerica has been traditionally placed at the Rio Soto la Marina in the state of Tamaulipas. In the Sierra de Tamaulipas, a small but rugged outlier mountain range, a large Postclassic archaeological site has been located. Approximately 1 km in lateral extent, it consists of a ball court associated with several plazas outlined by circular-shaped stone construction. This site apparently represents the northern most occurrence along the Gulf Coast of a Mesoamerican archaeological site with major architectural features. (34)

Paynter, Robert (Queens) SPATIAL PROCESSES OF STRATIFICATION: INTERPRETING CORES AND PERIPHERIES Social stratification, the condition of unequal access to strategic resources, is assessed with models of regional settlement organization. These models are designed to evaluate the relative position of a study area within an interregional system composed of surplus exporting peripheries and surplus concentrating cores. Applying these models of settlement organization to archaeologically relevant data is illustrated with information from the nineteenth century Connecticut River Valley. Applications to and implications for the prehistoric record are considered. (58)

Pearsall, Deborah M. (Missouri) PHYTOLITH EVIDENCE OF ACHIRA AND MAIZE CULTIVATION IN FORMATIVE ECUADOR Final results of the phytolith analysis of archaeological soil from Real Alto, a large Valdivia site in coastal Ecuador occupied from 3500-1500 B.C., confirm the preliminary evidence for maize (*Zea mays L.*) cultivation and suggest the presence of a second cultivated plant, achira (*Canna edulis Ker.*). Further testing of the method of identifying maize phytoliths archaeologically is described and the method employed to identify achira is discussed. A model for Valdivia and Machalilla subsistence is presented using the phytolith data and the results of the ethnobotanical and ethnozoological studies. (3)

Perlman, Stephen M. (Virginia Commonwealth) RELATIVE STABILITY OF COASTAL AND INTERIOR ADAPTATION The relative stability of coastal and interior hunter-gatherer adaptations are analyzed for both social and economic variables. The analyses are linked to the biological and behavioral characteristics of subsistence resources and man's capacity to exploit them. High productivity coasts are expected to provide the most stable subsistence resources for hunter-gatherers, while marginal coasts are lower and more effective resource exploitation results. These conditions play important roles in determining the hunter-gatherer social systems occupying interior zones and high productivity coasts. The results are lower social costs for these coastal social systems and a more stable adaptation. (50)

Phillips, James L. and Bruce G. Gladfelter (Illinois-Chicago) LATE ARCHAIC EXPLOITATION OF THE MIDDLE MISSISSIPPI RIVER FLOODPLAIN: A NEW VIEWPOINT Recently concluded excavation of a multicomponent site (Labras Lake, 11S299) in the American Bottom provides the data base for reevaluating Late Archaic exploitation of the Middle Mississippi River Floodplain. The interdisciplinary project, part of the FAI 270 Mitigation Program, has developed archaeological, paleogeomorphic, and paleobotanical information for erecting new models of Late Holocene prehistoric activity, in a time frame that has been largely overlooked in earlier work in this area. (23)

Pickering, Robert B. (Northwestern) MORTUARY BEHAVIOR IN THE ALTA VISTA PHASE OF CHALCHIHUITES CULTURE The Alta Vista phase of the Chalchihuites culture is typified by numerous and varied site types. Human skeletal remains have been recovered from sites ranging from farming hamlets to large ceremonial centers. Mortuary activities at these sites are compared to determine (1) age and sex of population segments that were interred at different site types, (2) differences in activity or status as indicated by artifact accoutrements, and (3) redundancy of mortuary behavior. (53)

Pickett, Christine (Oregon) THEORETICAL AND METHODOLOGICAL CONSIDERATIONS IN MIDDLE HORIZON CULTURE INTERACTION One principal concern of the Batan Grande-La Leche Project in north coastal Peru is the clarification of the nature and extent of Chavin, Moche and Huarí expansion and interaction with local cultures. This paper is concerned with the relative theoretical merits of the type-variety and stylistic approaches, two dominant approaches to questions of cultural interaction and process. These approaches will be examined in light of data pertaining to Middle Horizon manifestation at Batan Grande. (19)

Piperno, Dolores R. (Temple) PHYTOLITH EVIDENCE OF MAIZE CULTIVATION IN CENTRAL

PANAMA DURING THE EARLY CERAMIC (MONAGRILLO) PERIOD Phytolith analysis of archaeological soils from Aguadulce, a rock shelter located on the central coast of Pacific Panama, reveals the presence of cross-shaped silica bodies identifiable as maize (*Zea mays* L.) in deposits associated with the Monagrillo phase occupation of the site. Pre-ceramic deposits from Aguadulce produce no maize phytoliths and very few cross-shaped phytoliths of any size. The phytolith evidence indicates that the Monagrillo peoples of central Panama were cultivating maize during the early ceramic period. (3)

Pippin, Lonnie C. (Desert Research Institute) ABORIGINAL PATTERNS OF PINYON-JUNIPER ZONE RESOURCE EXPLOITATION ON THE NEVADA TEST SITE Ongoing archaeological research on the 3500 km<sup>2</sup> Nevada Test Site, southern Nye County, Nevada, is oriented toward understanding hunting and gathering adaptive systems and their processual changes through time. The determination of how aboriginal populations exploited their dynamic environment is basic to such a research design. This paper discusses the empirical evidence for aboriginal patterns of resource exploitation in the Pinyon-Juniper Zone on the Nevada Test Site. These patterns are then compared to ethnographic and previously hypothesized prehistoric models of resource exploitation in the southern Great Basin. (20)

Pittman, Holly (Columbia) THE GLYPHIC ART OF THE KAFTARI PERIOD AT TALE MALYAN Stylistic and iconographic analysis of the stratified sample of Banesh and Kaftari glyptic art from Tale Malyan provides relative and absolute dates for these periods and refinements in the chronology of Elamite glyptic art. Functional analysis demonstrates the variety of uses and users of seals at Malyan, giving clues to the structure of prevailing economic systems. The seals clearly document connections with distant areas in Iran; the closeness of these ties is examined and possible explanations for them are reviewed. (7)

Plante, Patricia R. (see Hardy, Kathryn D.) (26)

Plog, Fred (Arizona State) SARG: A RESEARCH ORIENTED DATA BANK The Southwestern Anthropological Research Group has undertaken research concerning prehistoric locational patterns during the last eight years. Records have been assembled on over 2000 prehistoric sites. The SARG data bank was structured specifically to meet research goals identified by participants. As those goals have changed and, especially, have been refined, the structure of recording and storage formats has also been modified. Ultimately, the structure of the data bank itself has been far less of a problem than the design of the research. Nevertheless, analyses done to date demonstrate the utility of computer storage of such data and of analyses using them. (6)

Plog, Stephen (Virginia) THE EVOLUTION OF SOCIAL NETWORKS IN THE AMERICAN SOUTHWEST Studies of ceramic design variation across space and of the spatial extent of exchange systems in the American Southwest have suggested similar trends in the evolution of social networks. These trends are described using data both from the area as a whole and from one specific area, the Black Mesa region of northeastern Arizona. Variation in the extent of social networks over time is examined in relationship to associated changes in demographic patterns, settlement systems, and marriage networks. (58)

Plog, Stephen (see Hardy, Kathryn D.) (26)

Pohl, Mary E. D. (Florida State) THE TERMINAL CLASSIC PERIOD ECONOMY AT TIKAL The analysis of faunal remains from terminal Late Classic Period occupation at Tikal is presented. The report is based on excavations in Group G, conducted by the Instituto de Antropología e Historia de Guatemala. The animal bones, when viewed together with information derived from other kinds of artifactual material, suggest that Tikal was a crucial link in the trading network characteristic of the end of the Classic Period. Specifically, Tikal may have been a transshipment point for tropical forest products. (56)

Poirier, David (Connecticut Historical Commission) SOUTHERN NEW ENGLAND ARCHAEOLOGICAL SURVEYS: A PRESERVATION PLANNING PERSPECTIVE Conservation archaeological research has witnessed a tremendous expansion within Southern New England during the past half decade. One result has been the substantial commitment of the area's archaeological research funding and personnel as well as the stimulation of academic research. An intensive review of all prehistoric conservation archaeological investigations within southern New England will examine their appropriateness with respect to (1) theory and methodology, (2) compatibility with the State Historic Preservation Office purposes, (3) regional compatibility of the data base, (4) cost effectiveness. Further a general summary will assess the contributions of this research to archaeological knowledge. (29)

Pokotylo, David (British Columbia) LITHIC TECHNOLOGY IN REGIONAL PERSPECTIVE: IMPLICATIONS OF LOCATIONAL PATTERNING IN LITHIC DEBITAGE Archaeological survey data are employed in a study of lithic technological variability and environmental patterning exhibited by limited activity and occupation sites in Upper Hat Creek Valley in the interior of British Columbia, Canada. Settlement categories are established on the basis of quantitative variation in lithic debitage assemblages inferred to represent differential tool manufacturing strategies. The distribution of debitage defined site types among environmental data classes provides tests of hypotheses concerning the function of the site types in the regional settlement patterns. The potential application of lithic debitage as useful indicators of subsistence-settlement strategy is also discussed. (17)

Pollak, Janet S. (William Paterson) PRELIMINARY MIDDLE WOODLAND SETTLEMENT MODEL FOR THE ABBOTT FARM SITE Evidence of intersite and intrasite variation is examined for the Middle Woodland occupations. Data supporting the inference of semi-sedentary villages are presented. Proximity of the sites to sources of a culturally desirable lithic material is evaluated and the presence of a caching precinct is proposed. Settlement pattern information from the unpublished site maps of the 1936-40 excavations is discussed and difficulties in utilizing the excavation records are assessed. (48)

Pollard, Helen Perlstein (SUNY-Plattsburgh) ECONOMIC IMPLICATIONS OF POPULATION AND RESOURCES IN THE CORE OF THE TARASCAN STATE Because the development of complex societies is associated with the intensification of asymmetrical economic exchanges, the study of economic networks is basic to understanding the evolution of early states. In A.D. 1520 Western Mexico was dominated by the Tarascan State, the only major political power to have emerged in the West. I propose to (1) locate and describe the basic economic resources used by the political core of the state, the Lake Patzcuaro Basin, (2) discuss the flow of these goods in regional and/or interregional exchanges, (3) isolate the institutional frameworks within which such flows existed, and (4) suggest the role such interchange played in the development of this complex society. (41)

Pool, Michael D. (Texas-Austin) SETTLEMENT SYSTEMS AND SOCIAL STRUCTURE DURING THE EARLY MOGOLLON PERIOD There has been little delineation of settlement systems and social structure for the Early Mogollon Period. Hypotheses concerning site location and degree of sedentism, as well as social structure relative to a documented change in settlement location, are proposed. These hypotheses are evaluated in light of published data and data from excavations and survey by the WS Ranch Project, and a tentative model of settlement systems for the Middle San Francisco River Valley is suggested. (27)

Portnoy, Alice W. (Texas Tech) EFFECTIVE USE OF PERSONAL EXPERIENCE IN THE FIELD Deliberate, planned and explicit use of the personal experience that field staff and crew members have during archaeological projects can enhance understanding of the project environment and how it may have been utilized in the past. It can also enhance learning during field schools. How to use this experience effectively is the subject of an ongoing study which uses prefield group briefings and workshops, analyses of field notes and journals, questionnaires and postfield debriefing individual taped interviews. The importance of the prefield activities and the need for additional activities during the project or field school are demonstrated and further suggestions made. (5)

Powell, Shirley and Michele Seme (Southern Illinois) A REEVALUATION OF INTERPRETATIONS OF FAUNAL INVENTORIES ON SMALL ARCHAEOLOGICAL SITES Variation in prehistoric site morphology has commonly been interpreted as indicative of variation in the activities performed at the sites. Preliminary analysis of faunal remains from sites located on Black Mesa, northeastern Arizona, has identified a covariation between site structural diversity and faunal diversity. The covariation has been interpreted as supportive of an interpretation of functional variability between classes of sites. Subsequent studies have suggested that the activities performed at presumably functionally distinct sites may be similar and that the morphological variability may be due to the season of occupation. Faunal inventories from the sites will be reexamined to evaluate both hypotheses. (55)

Prokopetz, A. Wayne (USDA Forest Service) RECONSTRUCTION OF SETTLEMENT PATTERNS IN DENSELY VEGETATED AREAS Research in areas of dense vegetation is hindered by lack of reliable survey data. In Northwest Florida a methodology emphasizing man-land relationships is being applied and, in conjunction with extensive and intensive survey techniques, is yielding reliable site information. These data are applicable to anthropological research and cultural resource management. Reconstruction of settlement patterns requires site data that accurately

delineate number, size, time and function. Many research designs use settlement pattern data for explanation of human behavior. For cultural resource management, settlement pattern analysis is critical to understanding the range of cultural resources that must be managed. (51)

Proulx, Donald A. and Richard D. Daggett (Massachusetts) **EARLY HORIZON SITES IN THE NEPEÑA VALLEY, PERU** Recently completed fieldwork has revealed the existence of over 40 Early Horizon sites in the Nepeña Valley, north coast of Peru—the largest such concentration yet found in a single coastal valley. Sites are clustered in the upper valley area and its tributaries; these include habitation areas, mountain top administrative posts and fortresses. Evidence suggests a dispersed settlement pattern on the valley floor with supervisory and defensive outposts located on strategic plateaus and mountain tops overlooking broad expanses of valley bottom. (19)

Raab, L. Mark (Southern Methodist) **EXPANDING PREHISTORY IN THE ARKANSAS OZARKS** In recent years the scope and pace of archaeological research in the Arkansas Ozarks have expanded in response to the demands of environmental protection laws and the questions of contemporary archaeologists. The result of these demands is a greatly expanded view of the range of variability in the archaeological resources of the region. Departing from the past emphasis on the region's bluffshelter sites, it is now apparent that the area contains important stratified sites in stream terraces and mountain-side benches, ridge-top sites, and mound groups. These resources afford an opportunity to attack a variety of contemporary research questions. (42)

Raber, Paul A. (Penn State) **THE TECHNOLOGICAL BASIS OF CHIEFDOMS** Recent study of the evolutionary position of chiefdoms suggests that the established taxonomies of evolutionary stages—band, tribe, chiefdom, and state or egalitarian, rank, and stratified societies—may be inadequate to account for the development of chiefdoms and states as recorded in the archaeological record. Consequently, concern has focused on isolating in chiefdoms those variables responsible for cultural evolution to and from that level. Reference to ethnographic, historical, and archaeological cases suggests that technology may be a significant evolutionary variable. (16)

Rafferty, Kevin (SUNY-Stony Brook/Arizona State) **MINING AND CRAFT SPECIALIZATION IN THE MIDDLE GILA VALLEY, ARIZONA** Recent investigations have revealed the presence of possible mines or quarries for the exploitation of micaceous schist at Gila Butte in the middle Gila Valley, south-central Arizona. This material was used as a tempering agent for ceramics by the prehistoric Hohokam populations in the Gila River Valley, particularly those residing in the vicinity of the Gila Butte. Detailed examination of these features will attempt to discern the prehistoric mining techniques employed and the volume of material removed from the butte. Combined with other data, this information will provide clues to the possible presence of ceramic craft specialization among the Hohokam populations residing in the Gila Butte locality. (54)

Randborg, K. (Copenhagen) **RANK, RIGHTS AND RESOURCES** The standard definitions of ranked societies (e.g., Service) upon which much archaeological work has recently been centered may put an undue stress on the sociopolitical aspects of leadership, veiling the differences in access to resources by redistributive economic mechanisms. Historical and archaeological evidence from north European societies of the bronze and iron ages suggests that economic distinctions may be of greater relevance. Ranked societies are acknowledged as a special type of society but are defined with an increased emphasis upon economic factor. (12)

Ranere, Anthony J., Richard C. Cooke, and Pat Hansell (Temple) **FOOD PROCUREMENT IN THE PARITA BAY REGION OF PANAMA, 5000 B.C.—A.D. 500** The Pacific coast of central Panama has been exploited longer and more intensively than any other coastline in the country, and for good reason. Dry season upwelling and the presence of several major rivers draining into Parita Bay make this the most productive coastal zone in Panama. Data derived from the 1979 reexcavation of the early preceramic shell midden Cerro Mangote are compared to data from previous research to characterize the food procurement strategies of Parita Bay populations from 5000 B.C. to A.D. 500. (15)

Rapp, George Jr. (see Collins, Susan) (3)

Raspet, Carol A. (Southern Illinois-Carbondale) **A PRODUCTION STAGE ANALYSIS OF LITHIC ARTIFACTS FROM THE LIGHTLINE LAKE SITE, LEFLORE COUNTY, MISSISSIPPI** A production stage analysis of the Lightline Lake chipped stone tools and debitage results in a two-stage production model for this Middle Woodland gravel-based industry. Data derived from the analysis are used to delineate the break in the production trajectory, document the occurrence of thermal

alteration, and determine its position within the trajectory. Results from the debitage analysis indicate that the two stages are spatially as well as technologically discrete. (37)

Rasson, Judith A. (Wilkes) **SAND-TEMPERED CERAMICS AND FOURIER SHAPE ANALYSIS** Results of testing the assumption that pottery found at a site was manufactured there are reported. Ware suspected to be local was tested, rather than suspected trade ware. The method used is Fourier Shape Analysis, a geological technique for sourcing sand samples. Using samples of 200 sand grains, the method statistically compares their shapes. The test site is Selevac, Yugoslavia, a stratified Neolithic village (5th–4th millennium B.C.). Sample sherds were selected from a number of levels to test both the utility of Fourier Shape Analysis and archaeological assumptions about pottery manufacture. (14)

Rattray, Evelyn (Ciudad, Mexico) **THE IDENTIFICATION OF TRADE CERAMICS AT TEOTIHUACAN** In continuing research at Teotihuacan involving collaborative studies between chemists and archaeologists, approximately 10,000 foreign "trade" sherds from Oaxaca, the Maya region, and the Gulf Coast have been identified. (34)

Ravesloot, John and Debra L. Martin (Southern Illinois-Carbondale) **MORTUARY AND PALEONUTRITIONAL ANALYSES OF BURIALS FROM BLACK MESA, ARIZONA: IMPLICATIONS FOR SOCIAL AND ECONOMIC ORGANIZATION** A preliminary review of burials recovered from excavations conducted over the last 11 years on Black Mesa, Arizona, suggests differential treatment of the dead. This hypothesis is based on the assumption that an individual's position in life is reflected in the treatment it receives at death. Examination of Black Mesa burials proceeds from two basic lines of investigation: (1) an examination of mortuary practices as derived from the mode of interment and associated grave goods; and (2) an examination of paleonutritional data from both macroscopic and microscopic analyses of skeletal material. Data derived from these analyses will be compared to determine if a correlation exists between nutritional standing and differential treatment of the dead, and its implications for the social and economic organization of the Black Mesa population. (54)

Ray, Robert H. (see Fritz, Gayle J.) (42)

Redding, Richard W. (Michigan) **SEASONAL CHANGE IN HERDING STRATEGIES: IMPLICATIONS FOR DYNAMIC MODELING OF PRODUCTION PROCESSES** Excavation at Tepe Sharafabad on the Susiana Plain in southwestern Iran has provided an opportunity to examine seasonal change in strategies of herding sheep and goats during the Middle Uruk period (ca. 5300 B.P.). A stratified refuse-filled pit was sampled. Based on geologic and cultural evidence the 4m deep unit excavated through the pit represents 2.5 years. Births of both sheep and goats were restricted to the late fall-early winter. Sheep/goats butchered in summer were younger than those utilized in winter. Seasonal differences in the sex ratio of the sheep/goats slaughtered may be indicated. The necessity of seasonally ascribed faunal data for testing implications derived from dynamic models of herding, and for that matter of hunting, is discussed. (16)

Reff, Daniel T. (see Pailles, R. A.) (53)

Renfrew, Colin (Southampton) **DOMINANCE AND SUBORDINATION: A SPATIAL ANALYSIS** The defining feature of ranked society is disparity in personal status, which in societies of prominent ranking implies both dominant and subordinate individuals in terms of power and authority. In sedentary societies there is a positive correlation between the size of a settlement or center and the status of its dominant authority, and in certain cases social ranking may also be reflected in the scale of monuments, including funerary ones. An algorithm, the XTENT model, is presented which employs these principles to explore political dominance/subordination relationships between localities, and which can be used to define the scale and relation of sociopolitical units, whether of segmentary, ranked or stratified societies, using data solely of location and of scale. (1)

Rice, Don S. (Chicago), Prudence M. Rice (Florida), and David G. Batcho and Leah Minc (Chicago) **MURALLA DE LEON: PRELIMINARY REPORT ON AN ABORIGINAL FORTIFICATION IN CENTRAL PETEN, GUATEMALA** Muralla de Leon is a dry stone wall construction on an elevated plateau northeast of Lake Macanche, Guatemala. Surrounded by water on three sides, the wall attains a maximum height of 4m, and has a perimeter of 1.4 km. Twenty-one structures are located inside the wall, spanning the Preclassic thru the Postclassic periods. Most interesting are quantities of Floral Park Protoclassic materials as well as a Postclassic "temple assemblage" inside the wall. Implications of this apparently defensive construction for the evolution of Classic Maya society are discussed. (56)

Rice, Prudence M. (see Rice, Don S.) (56)

Richardson, James B. (Pittsburgh) **MODELING THE DEVELOPMENT OF SEDENTARY MARITIME ECONOMIES ON THE COAST OF PERU** The paper will present a model explaining the shift from a hunting and gathering economic system to one based on maritime resources at some time between 7000 and 5000 B.P. The date for the critical shift can be explained by recent results of geological and climatological research on the west coast of South America. The modern distribution of littoral resources was not present before 5000-6000 B.P. The appearance of modern environments and resources on the Peruvian coast at that time allowed the development of maritime economies. Geological, climatological and archaeological data will be used to support the model. (15)

Riese, Berthold (Proyecto Arqueológico Copán, Honduras) **LATE CLASSIC RELATIONSHIPS BETWEEN COPAN AND QUIRIGUA: SOME EPIGRAPHIC EVIDENCE** A reevaluation of inscriptions at Copán and Quirigua indicates that late classic relations between these cities consisted in the adoption of dynastic attributes by Quirigua, a hostile encounter between rulers 18 Rabbit of Copán and Two Legged Sky of Quirigua, resulting in the capture of the former in A.D. 736. There is no evidence that this had disruptive effects upon Copán. A late mention of Copán ruler Sun at Horizon in Structure 1 at Quirigua suggests that friendly relations were reestablished later on. This and further evidence from architecture and archaeology should ultimately lead to a more comprehensive understanding of interactions between Copán and Quirigua in the Late Classic. (28)

Riggs, Rodney E. (Wisconsin-Madison) **FORT ANCIENT SETTLEMENT IN SOUTH CENTRAL OHIO** Recent surveys in southern Ohio, mainly along the Ohio River and the lower portion of several of its tributaries, have added considerable new data concerning Fort Ancient settlement behavior. These data, integrated with that previously recorded, are presented in the form of a description of Fort Ancient settlement in this area. Further, an analysis of site type and distribution through various riverine strata, as well as the spacing of the more permanent habitations along stream corridors, is interpreted in terms of possible cultural and environmental determinants. (40)

Riley, Carroll L. (Southern Illinois-Carbondale) **SPANISH CONTACT AND THE COLLAPSE OF THE SONORAN STATELETS** As late as the mid-sixteenth century, northern and central Sonora contained a number of political entities which we here call "statelets." These statelets had incipient urbanization, and a key position on the major trade route between Mesoamerica and the Southwest. When Jesuit missionaries recontacted Sonoran Indians after 1620, the statelets had disappeared and the Indians were living in dispersed rancherías at a very reduced level of culture. The process of change from more complex to simpler culture is examined and the role of the Spaniards in this process is analyzed. (53)

Rippeteau, Bruce (State of Colorado) **COLORADO AND ENERGY DEVELOPMENT: A STATE CASE-STUDY OF RIGHTS** Colorado is a state beset by major plans for oil shale, coal, uranium, oil, gas, and geothermal exploitation. In addition, other ground-destructive operations are planned or being implemented, e.g., molybdenum and heavy metal mining and massive energy transport corridors. As a state, Colorado seeks to control and minimize adverse aspects of such development by (1) MOA/Us with federal interests, (2) licensing actions taken under status-rights auspices, and (3) by influencing companies and local government. Cultural resources management well illustrates the frontier at the political and busy state level of interest, and examples of current and projected work are so presented. (44)

Robbins, Louise M. (UNC-Greensboro) **BIOCULTURAL HETEROGENEITY AMONG THE PROTOHISTORIC FORT ANCIENT PEOPLE** Emphasis on artifactual and skeletal similarities between sites with Fort Ancient culture in the past has obscured the fact that dissimilarities also exist. This report focuses on biocultural differences between site populations within the Fort Ancient region. Analyses of combined factors including physical trait complexes, pathological manifestations, burial practices, interment locations, and habitational configurations raise the issue of nonhomogeneous populations sharing a particular assemblage of material cultural items in a culturally defined area. (40)

Roberts, Daniel G. (see Townsend, Alex H.) (49)

Roberts, Michael E. (Peabody Museum) **SUMMARY AND ANALYSIS OF CULTURAL RESOURCE INFORMATION ON THE OUTER CONTINENTAL SHELF FROM THE BAY OF FUNDY TO CAPE HATTERAS** This paper will provide a synopsis of a recently completed study for BLM which summarized and analyzed existing inventory and theoretical data regarding the existence and expected integrity of prehistoric and historic cultural resources from mean high water to the 200 m

depth level of the mid- and north Atlantic Continental Shelf. A strong emphasis will be placed on the management implications of this project, with a detailed discussion of recommended management and planning approaches for land-modifying activities in the study area. (10)

Robertson, James (Michigan State) **ANALYSIS OF LITHIC DISTRIBUTIONS AT THE INCINERATOR SITE, DAYTON, OHIO** The Incinerator site (33MY57) is an Anderson Focus village located on the floodplain of the Great Miami River. Preliminary analysis of ceramics shows clustering which may reflect matrilocal residence areas. A hypothesis that each household controlled the use of the area between their house and the plaza has been advanced (Heilman 1975). A distributional study of chipped stone tool types is undertaken to test this hypothesis. However, distribution of the lithic materials demonstrates that the processes affecting the discard of stone tools and debitage differ from those of pottery. Moreover, the behaviors implied by the cross-feature refits suggest the localization of certain male-associated activities along lines of reflecting a community-wide men's group. (40)

Robinson, David G. (Texas-Austin) **CERAMIC TECHNOLOGY AND LATER PINELAWN/RESERVE BRANCH EXCHANGE SYSTEMS** Mineralogical analysis of a ceramic collection from west-central New Mexico tested hypotheses about economic and sociocultural processes between A.D. 750 through A.D. 1350. X-ray diffraction and petrographic analysis produced a data set of mineral constituents of the pottery. Descriptive and multivariate statistical analyses of these data helped to identify mineral patterning within them. This patterning was subsequently useful in tests of hypotheses addressed to pottery production and distribution within the study area. The patterning suggests that two levels of exchange—regional and local—were operative among the Pinelawn, Reserve and Mimbres Branches of the Mogollon. (27)

Robinson, Eugenia J. (Tulane) **SITE HIERARCHIES IN THE PREHISTORIC SETTLEMENT IN THE SULA VALLEY, HONDURAS** Prehistoric settlements in the Sula Valley have been disturbed by agriculture and the frequent meanderings of three major rivers. Sites on the east side of the southern portion of the valley, however, are remarkably well preserved. Survey in 1979 found a probable three-tiered Late Classic settlement hierarchy consisting of towns, villages and hamlets. Travesía, reported to have once had 1000 mounds, probably was the largest site in Late Classic times and occupied the highest level of the settlement hierarchy. (39)

Robinson, Linda Sickler (see Lundberg, Emily R.) (15)

Robinson, Paul A. (Rhode Island Historical Preservation Commission) **A DEDUCTIVE APPROACH TO MODELING SITE LOCATIONAL BEHAVIOR** Results from several controlled surveys in Rhode Island are used to test a model of settlement strategies derived from an adaptive perspective that hypothesizes the spatial outcomes of resource acquisition and use. The model specifies sets of behavioral strategies for hunter-fisher-gatherers and agriculturalists, mixes those strategies to account for spatial and temporal variability, and then predicts locational preferences. The model, formulated from anthropological and ecological literature, rather than site point data, is tested against controlled survey results, limiting the potential abuses of ethnographic analogy and increasing our understanding of why similar areas were settled disproportionately. (29)

Robinson, Ralph L. (Texas-San Antonio) **ENVIRONMENTAL CHRONOLOGY FOR CENTRAL AND SOUTH TEXAS: EXTERNAL CORRELATIONS TO THE GULF COASTAL PLAIN AND THE SOUTHERN HIGH PLAINS** Biosilica, plant and animal silica, separated from the sediments of twenty archaeological sites was analyzed, reconstructing the paleoecology of central, south, and coastal Texas. Biosilica was abundant in late Pleistocene, 14000 B.P. to Holocene, 400 B.P. age sites which have yielded little or no pollen. Relative vegetational biomass of mesic periods was indicated by phytoliths of tall grasses, trees, and palm. Diatoms, and freshwater sponge spicules were also important. Xeric periods were characterized by a dominance of phytoliths of short grasses and, rarely, trees. The vegetational biomass of mesic periods was highest during mesic intervals as correlated to glacial advances. (3)

Rogge, A. E. (Land and Water Resources Service) **EVOLUTION OF AGENCY COMPLIANCE: A CASE STUDY** The Bureau of Reclamation began developing staff expertise in cultural resource management in 1974. The motivation, scope, and growth of Reclamation's program is briefly reviewed and compared with other federal agencies. The evolving sophistication of compliance with cultural resource protective legislation in planning the Central Arizona Project is analyzed as a case study spanning more than a decade. The analysis documents a delayed reaction to the passage of new legislation, but shows that through a series of stages compliance is approaching the legislated ideals. Several challenges facing the profession as a result of new opportunities to participate at early project planning stages are discussed. (9)



Rolin, Buford (see Haikey, Larry D.) (45)

Rollinson, Martha A. (Arkansas Arch. Survey) PUBLIC ARCHAEOLOGY: RESEARCH AND DEVELOPMENT OF THE TOLTEC SITE A multiple mound ceremonial center on the Arkansas River is being preserved and developed as a state park. Objectives are to provide interpretation of the site and archaeology to the public. Stage I research of a long-range program involves assessing the nature and condition of cultural deposits to plan specific goals for Stage II. Controlled surface collections, soil cores, trenches, and a stratified random sample provide data on distribution of cultural deposits, condition and construction of mounds, and artifacts for preliminary technological and typological studies. (42)

Rollefson, Gary O. (see Simmons, Alan H.) (54)

Root, Dolores (Massachusetts-Amherst) TRACKING THE ARCHAEOLOGICAL RECORD: ARCHAIC SITE DISTRIBUTIONS ON MASSACHUSETTS' COAST In order to explain changes in the spatial organization of sites over time in post-glacial environments, we need to understand how changes in the environmental structure are reflected in the archaeological record. Ecological models of population distribution in fluctuating environments provide a framework for formulating and testing expectations of Archaic site distributions. Differential visibility of material culture are expected for the Late Archaic, as well as different site distributions and density patterns. Implications of these expectations are considered with respect to current ideas on the cultural changes which distinguish the Late Archaic from the Early-Middle Archaic. (35)

Rose, Richard M. (Hartwick) DESCENDING GODS AND THE MESOAMERICAN BALL GAME Descending human and animal figures and diving gods are portrayed in Mesoamerican art from Preclassic times on. The figures occur from the Valley of Mexico to the Yucatan and highland Guatemala. Descending and diving figures have been identified with rain and fertility rites and hallucinogenic drug rituals. There is also a strong association between descending figures and the Mesoamerican ball game ritual, the figures appearing on thin stone heads, mushroom stones, and ball game panels. It is suggested that the descending figure motif is representative of diving ball players and patron deities of the game and the ball. The form, distribution, and significance of the motif is representative of diving ball players and patron deities of the game and the ball. The form, distribution, and significance of the motif in ancient Mesoamerican society is discussed and a cultural chronology for the rubber ball game is proposed. (34)

Rosenberg, Michael (Pennsylvania) PALEOLITHIC AND EARLY NEOLITHIC SETTLEMENT IN THE MARV DASHT, IRAN Recent surveys extend the prehistoric sequence in the Marv Dasht back to the Middle Paleolithic. Early Neolithic settlements, however, appear rare if not absent in contrast to the substantial occupation demonstrable for the preceding and succeeding periods. Artifacts data suggest that early settlements based on cereal exploitation do not occur in the Marv Dasht, although the available environmental data do not preclude such exploitation. Thus, the Mushki-Jari ceramic assemblage probably reflects the appearance of an already full developed neolithic complex of outside origin. (7)

Rothschild, Nan A. (CUNY-Hunter) PENNIES FROM DENVER (EVIDENCE FOR A WAR BETWEEN DENVER AND NEW YORK CITY?) This paper will demonstrate a series of changes in interpretations of a data set (in this case, 4 samples of pennies), depending on the categories of information available to the analyst. The data are interpreted first simply as physical data, in terms of their spatial and temporal distribution. Then, a readily accessible documentary source is examined, and, third, the internal records of a Federal Agency are examined. Finally, two interpretive models are suggested which increase our understanding of cultural processes. (13)

Rovner, Irwin (North Carolina State) THE HISTORY AND DEVELOPMENT OF PLANT OPAL PHYTOLITH ANALYSIS Plant opal phytoliths are entirely mineralized, silica particles produced within the tissues of living plants. Many plants, especially grasses and other monocotyledons, produce vast quantities of varied and distinctive particles. For over a century phytoliths have been studied as a functional component of living plants and, more importantly, as a remarkably durable constituent of soil. However, only within the last decade has substantial progress been made in utilizing phytolith analysis in archaeology. Current research demonstrates an enormous capability of providing paleoenvironmental and subsistence data, often the only available botanical source, in a wide range of archaeological contexts. (3)

Rowlands, M. J. (see Giedhill, J.) (12)

Roy, Tye (Bureau of Land Management) DEVELOPMENT AND PRESENT STATUS OF THE CULTURAL RESOURCE MANAGEMENT PROGRAM ON THE OUTER CONTINENTAL SHELF Protec-

tion of marine and terrestrial cultural resources from potential impacts from federal offshore oil and gas leasing activities is provided by the federal Cultural Resource Management Program on the Outer Continental Shelf of the United States. The development of this program in Alaska, the Pacific, the Gulf Coast, and the Atlantic will be discussed. Procedural and technical problems will be discussed, and recommendations for improved program coordination, standards, and methods will be made. (10)

Rubenstein, Paul D. (USDA Forest Service) THE APPLE ORCHARD SURVEY: A VIEW OF UPLAND SETTLEMENT IN SOUTHWEST VIRGINIA The Apple Orchard survey is a Phase I Reconnaissance performed within a 211-acre impact area of the Jefferson National Forest in southwest Virginia. A total of fourteen prehistoric and two historic sites were identified during the reconnaissance. The findings will be approached from a cultural ecological perspective with analysis of site function and isolation of key environmental variables affecting site location. Lines of comparison will be made between the Apple Orchard survey and previous studies designed to formulate or test environmental models. (51)

Ruppe', Reynold J. (Arizona State) AN ASSESSMENT OF THE MARINE ARCHAEOLOGICAL SURVEY PROGRAM OF THE BUREAU OF LAND MANAGEMENT OUTER CONTINENTAL SHELF PROGRAM Marine survey archaeology has grown enormously in the past five years. There is a wealth of data potentially available from the remote sensing records which could be used to reconstruct inundated river banks, estuary areas, and barrier islands. Those landforms were the locations of prehistoric and historic habitation sites and watercraft. However, the signals produced by remote sensing must be subjected to ground-truth tests to determine if the cultural resources can be detected. Then archaeological analysis can be conducted and the cultural resources of the continental shelves can be managed and protected. (10)

Russell, Nerissa (Harvard) MODIFIED BONES AND BEHAVIORAL ANALYSIS Bone tools and bone modified in butchering and cooking have much information to yield. Faunal analysis generally concerns itself chiefly with the procurement stage of animal use. Modified bone can shed light on the consumption stage. Controlled experiments are useful in establishing functions of bone tools and in studying fracture patterns. Patterns of human behavior are observable in the way bones are modified and distributed. One can detect prehistoric decisions regarding faunal resource use in this way. (14)

Ryder, Peter R. (Pennsylvania) MOJICA: AN EARLY POLYCHROME CEMETERY IN NORTH-WESTERN COSTA RICA. Excavation of an Early Polychrome (300-800 A.D.) cemetery on the Guanacaste plain near the Tempisque River valley yielded the largest sample of complete ceramics from this period yet recovered at a single site. Ceramic clusters separated by parallel stone walls, each possibly representing a discrete burial, were recovered from the stone-fill mound cemetery, one of seven located in the same area with habitation sites of Early Polychrome date. Comparison with burial structures and associated ceramics in the nearby cordillera and Bay of Culebra region demonstrates local variation within the general homogeneity of mortuary practices detected in northwestern Costa Rica at this time. (2)

Sabo, George (Arkansas Arch. Survey) AN ETHNOGRAPHIC VIEW OF PREHISTORIC ESKIMO ADAPTION TO CLIMATIC CHANGE Ethnographic data are examined to identify typical Inuit adaptive responses to climatically induced changes in the distribution and availability of critical animal resources. The record of paleoclimatic change during the past 4000 years is reviewed, and the kinds of paleoenvironmental changes affecting prehistoric Eskimo populations (i.e. Pre-Dorset, Dorset, Thule) are summarized. It is suggested that significant technologic, economic, and settlement pattern changes would not have been required of these populations. The archaeological implications of this interpretation are discussed. (61)

Sayre, Edward V. (see Bishop, Ronald L.) (56)

Scarry, John (State of Florida) THE EMERGENCE AND EXPANSION OF FORT WALTON CULTURE: A PRELIMINARY MODEL A preliminary model defines Fort Walton culture as a variant of Mississippian, possessing ranked social organization and a maize agriculture subsistence base. The initial emergence of Fort Walton culture is attributed to population aggregation in riverine bottomlands by Late Weeden Island groups. The need to organize larger population aggregates, coupled with competition from similar groups, resulted in the ranked organization characteristic of Fort Walton and other Mississippian cultures. Following the initial development, individual Fort Walton systems increasingly interacted with each other and with other Mississippian systems. Later, Fort Walton groups expanded out of their narrow riverine environment into several upland environments suitable for maize agriculture. Settlement pattern shifts in these

areas mark phases of initial occupation, expansion and population growth, and population dispersal attributed to over-exploitation of local resources. (33)

Scheibel, Russell G. and Ann M. Early (Arkansas Arch. Survey) **THE PRODUCTIVE PARTNERSHIP: AMATEUR AND PROFESSIONAL IN ARKANSAS ARCHAEOLOGY** The Arkansas Archaeological Survey owes its existence and success in large part to a long-standing partnership between amateur and professional archaeologists. Amateurs have contributed to Survey projects at various levels of expertise and involvement. A review of Survey activities shows various avenues of amateur-professional cooperative endeavor in data collection and curation through survey, excavation, and laboratory work. Quantification of the labor investment and data return in these projects illustrates the significant benefits to Arkansas archaeology accrued through this continuing relationship. (42)

Schlanger, Sarah (see Kohler, Tim) (31)

Scholtz, Sandra C. (Arkansas Arch. Survey) **INFORMATION SYSTEM DESIGN FOR CULTURAL RESOURCE MANAGEMENT PROGRAMS** The cultural resource management programs which have developed during the last decade have interrelated management and research functions; and this relationship is reflected in the data needs of such programs. Management must organize, maintain, and make accessible various sources of information which serve administrative purposes as well as form the core of the cumulative resource base on which subsequent research is based. The data needs of an information system designed to serve a cultural resource management program are enumerated and are used to evaluate the state-wide archaeological data management system in Arkansas. (6)

Schortman, Edward (Pennsylvania) **ARCHAEOLOGICAL INVESTIGATIONS IN THE LOWER MOTAGUA VALLEY, GUATEMALA** The lower Motagua valley, northeastern Guatemala, though long known for the site of Quirigua, has been little understood over its full extent. Recent work has resulted in the location of 5 centers contemporary with Quirigua within this region: all are comparable to Quirigua, or greater than it, in both size and complexity. After briefly reviewing this data, several models are proposed which attempt to answer newly posed questions concerning the factors affecting the location of major Late Classic centers here in both regional and inter-regional terms. (39)

Schortman, E. (see Willey, Gordon R.) (39)

Schuldenrein, Joseph (Chicago) **LATE QUATERNARY PALEOENVIRONMENTS AND PREHISTORIC SITE DISTRIBUTIONS IN THE LOWER JORDAN VALLEY** Prehistoric investigations in the lower Jordan Valley established late Pleistocene sequences at open air sites indicating distinctive paleoenvironmental conditions from Mousterian through Chalcolithic times. Detailed field mapping and sedimentological techniques featuring thin section microscopy isolated stages of alluviation, pedogenesis, and colluviation associated with Kebaran, Geometric Kebaran A, and Natufian cultures at Wadi Fazaal. Ten kms to the south, at the tectonically created Saliblya Depression, Neolithic sites flank Natufian occupations across a 2-km west-east transect. These later prehistoric sites are associated with marsh deposits and spring locales suggesting wetter habitats especially during the Neolithic. A terminal Pleistocene/early Holocene paleo-climatic reconstruction is outlined based on natural stratigraphic correlations of the prehistoric sites. (30)

Scott, R. F., IV (Wyoming) **FAUNAL RESEARCH AT COLHA** Faunal preservation is excellent at the site of Colha, Belize. A large sample of animal bones has been studied in some detail, and those from the 1980 season have been examined in a preliminary fashion. There is evidence of a heavy dependence on aquatic resources. Details on this aspect of the subsistence regime and on the exploitation of terrestrial mammals are presented in the paper. (18)

Scott, Stuart D. (SUNY-Buffalo) **CORE VERSUS MARGINAL MESOAMERICA: A COASTAL WEST MEXICAN PERSPECTIVE** Extensive reconnaissance and excavations in coastal Sinaloa/Nayarit since 1968 have yielded new results, in both the Preclassic and later archaeological contexts. These results, from a cross-disciplinary research program of the State University of New York, suggest that this northwestern coastal zone, although physically marginal to Precolumbian developments in the Central Mexican area, was (1) occupied earlier than previously supposed and (2) now presents itself more strongly as a key area of ancient Mesoamerica. (41)

Seme, Michele (see Powell, Shirley) (55)

Senter, Donovan C. (Mexican National) **THE PRODUCTION OF POTTERY AT CUENTEPEC,**

**MORELOS** This paper summarizes a detailed study of pottery-making techniques at Cuentepec, a modern nahua-speaking Tlahuica village, ten kilometers north of Xochicalco, Valley of Xochicalco, Western Morelos. Petrographic analysis of the temper and x-ray diffraction analysis of the clay is compared with same type of analyses already published by the author on 65 microtypes from the Postclassic Tlahuica village of Zacatepechil located in the same geological source environment. (34)

Shackley, Myra L. (Leicester) **CANFORD HEATH BARROW: CONSTRUCTION AND PALEOENVIRONMENT FROM A TRUNCATED PALEOSOL** Excavation of a barrow at Canford Heath (Dorset) revealed the old ground surface, a mature humus-iron podsol with the L-H layers missing. The barrow mound was constructed of spade-sized clods, heaped up at an acute angle in at least five different layers, each clod comprising the A-E<sub>a</sub> layers of the original buried soil. The construction method of the barrow was revealed, which included the initial digging of a shallow central pit into which had been dumped the missing humus-rich L-H layers from the buried soil. Reasons for this behavior pattern and comparable sites are discussed. (38)

Shadow, Robert D. (Montana State) **EVOLUTION OF LAND USE AND LAND TENURE IN THE MUNICIPIO OF VILLA GUERRERO, JALISCO, MEXICO** Ranchos and rancho-based regional societies have been quite neglected in the study of Mexican rural social history. As operators of medium-sized agricultural units, these rancheros emerged in the 19th century and occupied a middle ground between the great land barons and the landless peones. By analyzing the evolution of land use and land tenure patterns, this paper traces the origins and organization of one rancho regional society located on the eastern flanks of the Sierra Madre Occidental in northernmost Jalisco. An hypothesis is offered concerning the general demographic and ecological factors giving rise to rancho-based society and economy. (41)

Shafer, Harry J. (Texas A&M) **LITHIC WORKSHOPS AT COLHA AND PRECLASSIC CRAFT SPECIALIZATION** Excavations at four chert workshops at Colha, Belize have yielded striking examples of lithic tool production from Late Preclassic through Early Classic periods. The production at the respective workshops was very systematic and specialized toward the manufacture of only certain tools or tool sets. These findings provide convincing evidence that lowland Maya craft specialization in lithic production was indeed part of the economic structure by the late Preclassic, if not before. Late Preclassic and Early Postclassic workshops are compared, implications of the observed temporal changes are discussed and the concept of "craft specialization" is addressed. (18)

Shafer, Harry J. and Anna J. Taylor (Texas A&M) **FORM AND USES OF MIMBRES CLASSIC BLACK-ON-WHITE AT THE NAN (HINTON) RANCH RUIN, GRANT COUNTY, NEW MEXICO** Recent excavations at the NAN Ranch Ruin have yielded new information on the function of Mimbres Classic Black-on-White ceramic vessels. These findings are used to advance the hypothesis that Mimbres Classic Black-on-White was basically a utilitarian ware manufactured for certain domestic uses. Wear patterns on the vessels and vessel context suggest that mortuary vessels were drawn from the then existing sample of bowls instead of being a specially made class of pottery. These findings point out a further complexity in identifying household or kinship units based on ceramic associations with burials occurring beneath the floor of a single room. (27)

Shane, Orrin (see Wagner, Gail E.) (40)

Sharer, Robert J. (see Jones, Christopher) (28)

Sharer, Robert J. (see Beaudry, Marilyn P.) (39)

Sharer, Robert J. (see Willey, Gordon R.) (39)

Sheehy, James J. (Pennsylvania State) **IMPLICATIONS OF FINE PASTE CERAMICS AT TRAVESIA** The presence of local fine paste ceramics at Travesia and elsewhere in the Sula Valley, northwest Honduras, is interpreted as a form of "import replacement" whereby local potters copied the technology and actual vessel forms of imported Fine Orange Ceramics of the Altar Group. The significance of this period of "import replacement" and the subsequent abandonment of Travesia is discussed in regard to socioeconomic changes occurring in Mesoamerica and in the southern periphery. These changes include the emergence of important economic networks along the Pacific coast from lower Central America through El Salvador, Guatemala, and into Mexico. (39)

Sheets, Payson D. (Colorado-Boulder) **REGIONAL ECONOMIC RELATIONSHIPS IN THE ZAPOTITÁN VALLEY, EL SALVADOR, AS INDICATED BY OBSIDIAN ANALYSES** Regional

economic patterns in obsidian distribution, manufacture, and use were divulged by typological and quantitative analyses of artifacts from the Zapotitán Valley, El Salvador. Six quantitative indices revealed factors such as expertise, material access, maximization, and technology. Not surprisingly, large centers did control the obsidian trade into the valley and redistribution within. However, they did *not* dominate manufacture. With the exception of hamlets, the smallest community type, manufacture was performed per settlement by resident knappers. Hamlets perhaps were beyond a size threshold for part-time specialization and relied on itinerant specialists from major centers. (39)

Shelley, Steven (Louisiana State) **ARCHAEOLOGICAL SURVEY IN KISATCHIE NATIONAL FOREST: AN INTEGRATED SURVEY METHOD FOR HEAVILY VEGETATED AREAS AND CULTURAL RESOURCE MANAGEMENT** Archaeological survey in densely vegetated areas requires a special survey method. The 1979 Kisatchie survey uses a method that takes advantage of clearcuts and roads to gain insight into the archaeology of the area, and uses this insight to direct the second phase of the survey. Regression analysis is used to determine the representativeness of the survey sample, and to generate a predictive model that can be used to direct future surveys and manage cultural resources. (51)

Shennan, Stephen J. (Southampton) **EXCHANGE AND RANKING: THE CASE OF AMBER** The role of amber in the relationship between the organization and control of exchange and the development of social ranking is considered. It is shown that there is a shift away from a situation in which there is a general falloff in the quantity of amber with distance from the source to one in which exchange becomes directed towards areas which develop marked ranking. The role and significance of amber in the earlier Bronze Age of Britain and Denmark are compared and contrasted. (1)

Shennan, Susan E. (Southampton) **FROM MINIMAL TO MODERATE RANKING, OR HOW SOME BECAME MORE EQUAL THAN OTHERS** It is argued that more detailed scales of ranking need to be substituted for evolutionary typologies, which are both unsatisfactory in themselves and tend to lead to correspondingly generalized explanations. An example is presented in which the process of social differentiation from minimal to moderate ranking may be traced in detail owing to the availability of well-documented funerary data with close chronological control. (1)

Shephard, Steven J. (Southern Illinois-Carbondale) **AN ARCHAEOLOGICAL MODEL: CHANGE IN THE NINETEENTH-CENTURY URBAN MIDDLE CLASS** Few studies have made systematic attempts to relate specific aspects of the urban environment to particular changes in class structure. A model is developed that correlates certain variables of urbanism with the degree of socioeconomic heterogeneity in the middle class. To operationalize this model a framework is constructed that establishes a relationship between certain types of consumer behavior and middle class membership. Hypotheses and archaeological testable implications are deduced from this framework and are evaluated with data produced from Alexandria, Virginia's, "test square" site. (57)

Shephard, Steven J. (see Stephens, John F.) (57)

Sherratt, Andrew (Oxford) **DENSITY, DISTANCE AND INTERACTION: THE PROBLEM OF SCALE** This paper considers the gross distribution of population among early agricultural groups in the western Old World and assesses the potential patterns and scale of interaction between component parts under changing conditions of transport. Information from excavation and survey in Europe and the Near East has allowed a tentative reconstruction of the distribution and concentration of population at various times in the prehistoric period. The layout of settlement on the ground determines potential patterns of contact and interaction. Contrasts through time arise from the changing shape of the network, the agglomeration or dispersal of population within it, and the efficiency of transport available. (12)

Shimada, Izumi (Princeton) **BATAN GRANDE AND THE EVOLUTION OF THE LAMBAYEQUE CULTURE: RELIGIOUS AND ECONOMIC CONSIDERATIONS** The Batan Grande-La Leche Project on the North Peruvian coast focuses upon elucidation of (1) the evolutionary processes of the elusive Lambayeque Culture with Moche and Wari elements, and (2) exploitation and management of regional agricultural and mineral resources. Systematic transect survey, excavation and paleoecological analysis show that Batan Grande attained religious and economic eminence on the North Coast based on syncretism of various ideologies, peculiar land-use patterns, strategic location for interregional trade and large-scale mining. The role of Batan Grande and of religion in Andean civilization in general is then considered. (19)

Simmons, Alan H. (Professional Analysts) **BIG BUCK ARCHAEOLOGY—THE OTHER SIDE OF**

**THE COIN** Concomitant with the proliferation of "corporate archaeology" is a distressing trend towards archaeology for profit. Profit-oriented archaeology per se is not undesirable, yet when profit-making motives replace scientific problem-orientation as primary project goals, the archaeological resource is bound to be compromised. An earlier paper addressed mercenary archaeology at a field level. This paper focuses on upper management responsibilities. This trend is not restricted to private corporations. The same tendencies are perceived in some aspects of institutional and government archaeology. Various aspects of the problem are discussed, and suggestions for improvement are recommended. (62)

Simmons, Alan H. and Gary O. Rollefson (Professional Analysts) **EARLY ATHABASKAN OCCUPATION IN NORTHWESTERN NEW MEXICO: NEW ARCHAEOLOGICAL EVIDENCE** Although early Athabaskan occupation in the Southwest is inferred from a variety of sources, substantial archaeological data are generally lacking. Most sites are "pueblitos" with low artifact densities, making it difficult to critically define assemblages. Investigations on the Navajo Indian Irrigation Project recovered a unique site relating to this period. The site is economically specialized. Bone, ceramics and chipped stone are abundant, although architecture is ephemeral. Particularly significant is the recovery of nearly 10,000 chipped stone artifacts, including almost 200 projectile points. This large assemblage aids in critical definition of the period, as well as comparisons with earlier assemblages. (54)

Sjoberg, Alf (North Carolina) **IMPLICATIONS OF SPATIAL DIFFERENCES IN SOIL CHEMICAL ELEMENTS WITHIN AN ARCHAEOLOGICAL SITE** This paper evaluates a method for the delimitation and functional analysis of activity areas. Atomic absorption spectroscopy and colorimetry of sediment samples for calcium (Ca), phosphorus (P), and potassium (K) concentrations are correlated with data on distribution of lithic debris and data from microscopic edge-wear analysis of implements which show evidence of use. The results indicate that increased elemental concentrations of Ca, P, and K correlate with the distribution of lithic debris. Furthermore, concentrations of Ca and K correlate spatially with used implements showing wear patterns which appear to have originated in activities involving bone and wood respectively. The data seems to confirm the usefulness of chemical analysis as a method for delimiting and analyzing differential use within archaeological sites. (38)

Smith, Bruce D. (National Museum of Natural History) **THE SPATIAL DISTRIBUTION OF LATE PREHISTORIC HORTICULTURALISTS IN THE EASTERN UNITED STATES** After A.D. 1000, many of the floodplains of the larger rivers in the Eastern United States supported horticultural populations with a fairly uniform adaptation to meander-belt habitat zones. A model is presented that identifies those variables, both environmental and cultural, that appear to have determined the spatial distribution of such populations. Environmental variables to be considered include soil types and the distribution of oxbow lakes, while cultural variables include the need for boundary maintenance and social cohesiveness. (36)

Smith, Charles R. and Frederick W. Lange (Illinois State) **HISTORIC SITES: MANAGING A DYNAMIC RESOURCE** Cultural resource management strategies for prehistoric and historic sites have common conservation goals for the future; however, the management challenges, although similar at first glance, are really quite different. When the dynamic dimension of history is considered, the potential for historic sites is infinite, but the future role for archaeologists has not been considered. A continuing role for archaeologists is seen, especially in studying the "inarticulate" segments of society, and the need for "anticipatory mitigation" is examined. (62)

Smith, Marion F., Jr. (Oregon) **ARCHAEOLOGICAL CERAMICS AS VESSELS: RELATING MORPHOLOGY TO UTILITARIAN FUNCTION** The form of ceramic artifacts is largely determined by intended primary function, and much information on the morphologies of parent vessels survives in sherd assemblages. A mathematical model of vessel form is used by a computer to simulate the formation of sherd assemblages from functionally-categorized vessels from certain ethnographic cultures of North America. Certain morphological attributes of these "sherds" are "measured," and those that are most effective in distinguishing functional categories are isolated by a statistical discriminant analysis. Results (for example, from the American Southwest) and implications are discussed. (35)

Smith, Marvin T. (see DePratter, Chester B.) (61)

Snarskis, Michael J. (Museo Nacional de Costa Rica) **LA CABANA: PLAZA-PLAN ARCHITECTURE IN THE TROPICAL RAIN FOREST OF EASTERN COSTA RICA** The horizontal excavation of the La Cabana site (A.D. 1100-1350) adds important new data to the scanty information for archaeological settlement patterns in Costa Rica. This site, along with Las Mercedes, Guayabo de Turrialba and other architectural sites surveyed by the author, has stimulated new hypotheses on

the nature of settlement systems and sociopolitical organization in eastern and central Costa Rica. The functions of such features as walled plazas and paved roads between sites are discussed in the context of local and regional ceremonial/redistributive networks. The role of the tropical forest environment on the formation of such networks is emphasized. (2)

Snyder, Dave (Southern Illinois-Carbondale) STRIP MINING AND ARCHAEOLOGY: A CRM EVALUATION FROM SOUTHERN ILLINOIS The current acceleration in the development of surface strip mining in southern Illinois will result in considerable destruction of the archaeological record and poses special managerial problems for archaeologists. This paper considers an evaluation of the role of professional archaeologists in the review process, the determination of significance, and design of research for sites in disturbed areas. An attempt is made to assess effectiveness of managerial responses by examining the development of different information systems and the role they play in managerial decisions in a case study from southern Illinois. (62)

Spears, Carol S. (North Carolina) COLLECTING DATA TO RELATE THE ARCHAEOLOGICAL CONTEXT TO THE SYSTEMIC CONTEXT: APPROACHES TO THE STUDY OF NON-SILICEOUS STONE UTILIZATION Relating the archaeological context to the systemic context involves understanding both cultural and natural formation processes at a site and developing transformation models. Transformation models such as behavioral chains and flow models are hypothesized for several activities that involve either the intentional and/or use modifications of several categories of non-siliceous stone tools. Examples are drawn from the analysis of surface data from the Village Creek Archaeological Survey in Arkansas and the analysis of excavated data from the Selevac Site in Yugoslavia. (14)

Spence, Michael W. (Western Ontario) EXCHANGE AND THE DEVELOPMENT OF RANK Two important New World transitions are examined: from Early to Middle Formative in Mesoamerica, and from the early burial complexes to the Hopewellian interaction sphere in North America. In both cases, the introduction of new commodities triggered a series of social and economic changes, culminating in the development of an hereditary elite. Trace element analyses of obsidian and silver provide data on some of the crucial trade relationships. An examination of trade partnership, the institution underlying much exchange in simple societies, reveals some of the processes involved in the transition. (26)

Spencer-Wood, Suzanne M. (Massachusetts-Boston) THE DEVELOPMENT OF AN URBAN ARCHAEOLOGICAL PREDICTIVE MODEL A procedure for formulating an archaeological predictive model is developed as a test case for Somerville, Massachusetts (part of Greater Boston), for the second half of the 19th century. Expected differences in family consumption patterns are predicted from probate inventories in conjunction with federal census data. Then individual families are located on a series of 19th-century maps to form a profile of changing neighborhoods with regard to ethnic, occupational and socioeconomic status. An architectural and archaeological survey locates potential sites where the predicted differences in consumption patterns can be tested. (16)

Spickard, Lynda E. (Colorado) STRATEGIES FOR SUSTAINED YIELD OF FISH RESOURCES Hunting and gathering societies frequently exploit natural resources at less than 50% of carrying capacity. This practice has been viewed as the product of adaptive strategies designed to guard against prey populational cycles and environmental perturbations over the long term. How closely do these decision-making strategies compare with ecological and economic models of optimal yield? Several fisheries models of both trophic-dynamic and single-species exploitative varieties are discussed. Fish exploitative patterns through 9,000 years of prehistory at Namu, B.C., are examined from the perspective of sustained yield of resources. (35)

Stamps, Richard B. (Oakland) ACCOUNTABILITY IN ARCHAEOLOGY: WHO OWNS THE BONES? Accountability in archaeology is discussed with an attempt to define different communities to whom we are accountable and in what ways. The "Professional Ethics" of the American Anthropological Association (1973) and the suggested code of ethics for sociologists (1968) provide a base for this discussion. The issue of human remains and Native American Religious beliefs is discussed as an example of the conflict between different communities to whom the archaeologists are accountable. (62)

Starna, William A., Currie D. Marr, and Donald Kane (Oneonta) PLANT OPAL PHYTOLITH ANALYSIS AT THE STREET SITE, OTSEGO COUNTY, NEW YORK STATE: A PROGRESS REPORT Plant opal phytolith analysis appears to be a potentially useful tool toward explicating both macro- and micro-environments for archaeologists in the Northeast. Samples from the Street Site are being examined to determine the feasibility and success levels of such analysis. A variety of extraction procedures are producing silicified bodies identified at the Class level and lignin frag-

ments identifiable at the generic level. Further testing is in progress. If such analyses are successful they will allow for detailed floral studies heretofore unknown in this region, and will offer not only an alternative to traditional paleoenvironmental studies, but will both support and supplement them. (3)

Stein, Julie (Minnesota) THE EARTHWORM: AN UNSUSPECTED NEMESIS FOR ARCHAEOLOGISTS Conspicuous perturbations in archaeological sites are readily detected during excavation. But one animal whose destructive effects are not often recognized is the earthworm. Work at the Carleton Annis mound in Kentucky, and Archaic shell midden, has resulted in the identification of areas of extensive earthworm disturbance. The methods of documenting this activity (identification of soil structures, determination of phosphate and organic carbon content, and observation of modern processes) are discussed. The general conditions most favorable to earthworm productivity and the types of archaeological sites most readily affected are enumerated. (38)

Steinen, Karl T. (West Georgia) LAND USE AND SITE DISTRIBUTION IN THE PREHISTORIC GEORGIA PIEDMONT Archaeological survey of three transmission line rights-of-way have disclosed aspects of aboriginal site distribution and land use in the Georgia piedmont west of Atlanta that have hitherto been unrecognized. Sites located through stratified random sampling are statistically treated to allow for a discussion of their internal variability. Relationships of sites to five topographic variables are discussed in relation to a model of land utilization developed from ethnohistoric records. (33)

Stephens, Jeanette E. (Illinois) THE INTRA-SITE SPATIAL STRUCTURE OF MULTICOMPONENT ARCHAEOLOGICAL SITES The spatial structure of archaeological sites reflects the kinds of decisions that their occupants made concerning the organization and utilization of space. At multicomponent sites the problem of distinguishing discrete areas of usage is particularly difficult to address. However, by considering the distribution of a site's artifactual material as data related directly to the site as a spatial whole, patterns of site utilization can be distinguished that transcend the individual idiosyncrasies of particular occupations. A discussion of spatial structuring is presented using data from multicomponent sites in southern Illinois. (35)

Stephens, John F. and Steven J. Shephard (Alexandria Archaeological Research Center) THE VOLUNTEER PROGRAM: DEVELOPING A SYMBIOTIC RELATIONSHIP BETWEEN THE PROFESSION AND THE PUBLIC Public archaeology involves the establishment of a complementary relationship between members of the professional community and the general public to enhance archaeological study, management, and education. A community volunteer program provides a structure which maximizes the mutual benefits derived from such a relationship. The Alexandria Archaeological Research Center established a volunteer program in 1977 to aid in the study and survey of the city and to create a community group knowledgeable in contemporary research goals, ethics and conservation. The implementation, structure, and maintenance of this program, as well as the resultant profits to both professionals and the public, are discussed. (57)

Steponaitis, Vincas P. (SUNY-Binghamton) SETTLEMENT HIERARCHIES IN NONMARKET CONTEXTS: THE FORMATIVE PERIOD VALLEY OF MEXICO A theoretical model is presented which explicitly relates certain aspects of political complexity to patterned variation in settlement size. Unlike Christaller's central place theory, this model applies specifically to hierarchical societies without well-developed market economies—societies that Service would classify as chiefdoms and (perhaps) simple states. Using settlement data from the Formative period Valley of Mexico, I show how this model is useful in estimating (1) the number of levels in a regional political hierarchy, and (2) the relative amount of surplus food mobilized to support the political establishment. (36)

Sternberg, Robert S., Robert F. Butler and Randall H. McGuire (Arizona) SOME PALEOMAGNETIC CONSIDERATIONS FOR ARCHAEOMAGNETIC DATING Contradictory evidence exists concerning how magnetization is acquired by hearths. Thermal and alternating field demagnetization experiments indicate that magnetite or titanomagnetite is the primary carrier of the remanence with blocking temperatures up to 600° C. However, Krause and Elghmy have not measured temperatures above 400° C in experimentally fired hearths. Thus thermochemical remanence may be a factor although this would not necessarily invalidate archaeomagnetic dates. Hearths apparently are sufficiently precise magnetic recorders to delineate major trends of geomagnetic secular variation and allow archaeomagnetic dating. The spatial variation of the geomagnetic field over the region covered by a secular variation curve presents a limitation to the ultimate precision of dates. The accuracy of hearths as magnetic recorders can be evaluated by looking at post-1900 hearths and comparing results with observatory records, and by comparing older archaeomagnetic dates with independent chronological evidence. (11)

Sternberg, Robert S. (McGuire, Randall H.) (11)

Storey, Marianne (see Nagle, Christopher) (43)

Storey, Rebecca (Penn State) CHIEFDOM SOCIETY IN DEMOGRAPHIC PERSPECTIVE Cross-cultural archaeological and ethnographic data are used to overview two crucial areas of interest in the study of chiefdom demography: the distinctiveness of the demographic profile of chiefdoms and the implications for cultural evolution of the demographic characteristics of chiefdoms. Available data are discussed and future research is suggested. The overview concludes that demographic analysis can provide important clues for recognizing chiefdoms archaeologically and for understanding the development and elaboration of the chiefdom sociopolitical level in general cultural evolutionary terms. (16)

Stohtert, Karen E. (Texas-San Antonio) THE EARLY VEGAS ADAPTATION OF SOUTHWEST COASTAL ECUADOR Aspects of the adaptation of the early (10,000-7000 B.P.) Vegas people are discussed. The evidence indicates that the Vegans were sedentary and practiced broad spectrum hunting and collecting, extending cultural control over some plant species by 8000 B.P. Neither the Vegas technology nor subsistence practices suggest a specialized fishing or shell-fishing adaptation. Similarities in subsistence, technology and burial practices between the Vegas culture and cultures of preceramic peoples in northern Peru and Panama suggest a spread of people along the Pacific coast by sea. (15)

Stright, Melanie J. (Department of Interior) ARCHAEOLOGY ON THE OUTER CONTINENTAL SHELF: PROBLEMS AND POTENTIAL The legally mandated protection of archaeological sites on the OCS from the effects of federally permitted actions has been compiled with in the past by avoiding any known or suspected sites. This approach, combined with suboptimal use of remote sensing equipment, and inadequate methods for further investigation has yielded little information on the archaeology of the continental shelves. To resolve some of these current problems, the federal government is funding studies to improve site detection through remote sensing surveys and core analysis, thus ensuring that avoidance procedures truly protect sites, and also maximizing information gains in OCS archaeology. (10)

Stuckerl, Caroline M. (Pennsylvania) ROMAN TO SAXON: POPULATION BIOLOGY AND ARCHAEOLOGY The historical and archaeological record amply attests to radical culture change in England between the 4th and 7th centuries A.D. Understanding of the mechanisms and processes of that change, however, is hampered by inadequate information on population structure and possible movements at that time. This study examines the viability of several alternative hypotheses designed to explain this particular instance of culture change. Osteological and archaeological data are used. (63)

Sumner, William M. (Ohio State) THE MALYAN PROJECT: INTRODUCTION The Malyan Project developed from a survey of the Kur River Basin (Fars Province, Iran) in which over 700 sites were recorded. At Tal-e Malyan, identified as the Elamite city of Anshan, investigations provided information on occupations from about 3400 through 1000 B.C. The objectives of the project are outlined and the administrative, theoretical and methodological problems of large scale, multi-disciplinary research are presented. Problems regarding the number, size and location of excavation operations as well as sampling and data recovery methods within operations will be discussed. (7)

Sweeney, Jeanne S. (Proyecto Arqueologico Copan) DEVELOPMENT OF THE BALL COURT COMPLEX, COPAN, HONDURAS There is a complex of structures in the southern Great Plaza at Copan, the stratigraphy of which suggests that there were nine or ten phases of building and modification. These phases are associated with a large platform, Structure B, to which were appended at different times three structures on the north and east and three successive Ball Courts on the southeast. When Ball Court II was built, Structure B was buried but the other buildings were used until the great Late Classic construction era when Ball Court III was erected. Comparisons between early and later Ball Courts at Copan and Quiriqua will be made. (56)

Swegle, Mark (see Buikstra, Jane E.) (5)

Syrenki, Alan T. and David P. Braun (Southern Illinois-Carbondale) ORGANIZATIONAL THEORY AND SOCIAL INFERENCE Methodological issues in the archaeological study of social organizational processes are reviewed and a possible approach to their resolution is outlined. This approach emphasizes the development of an analytical perspective on the organization of social activity, drawing from analogous perspectives in organizational theory, theoretical ecology, and systems theory. Such a perspective enhances the construction of arguments of plausibility by

emphasizing the uniformitarian character of social organizational processes. The perspective dictates the linking of abstracted organizational variables to specific variables in the organization of human activity. Construction of archaeological bridging arguments for evaluating social inferences is thereby also enhanced. (58)

Talmage, Valerie (Massachusetts Historical Commission) A MODEL FOR MANAGEMENT The planning model provides the process by which the Massachusetts Historical Commission will be able to make rational and defensible decisions regarding the future of cultural resources in the state. Resource management strategies vary according to four elements: knowledge of resources, the resources themselves, threats to the resources, and the constituencies who act to protect the resources. Since none of these four elements is constant across Massachusetts, MHC's management strategies will necessarily vary across the state. Study units divide the state into manageable areas which allow for analysis of regional trends of each of the four elements. (9)

Tamplin, Morgan J. and Rodger Jones (Trent) GEOCHEMICAL STUDIES OF IRON AGE SITES IN SOUTHERN AFRICA Recently, archaeologists in southern Africa have begun to investigate the chemical and physical nature of Iron Age sites. From these analyses, they hope to better understand the nature the occupations and the degree of alteration of the natural soils. Preliminary results of one such study undertaken on the large (50 hectare) Leopard's Kopje Phase site dated at A.D. 940 (eastern Botswana) are reported here. Samples were taken primarily for phosphate analysis using techniques developed by Eidt, in the hope of defining less obvious occupations and cattle kraals. Sediment analysis was also done, in order to clarify the complex geomorphological history of the area. (38)

Taylor, Anna J. (see Shafer, Harry J.) (27)

Thomas, Prentice M. (New World Research, Inc.) TESTING SHALLOW SITES IN FORESTED AREAS Archaeological techniques are poorly developed for testing shallow sites with low artifact density in forested areas. A crucial problem is that of collecting adequate artifact samples for chronological placement and assessment of site function. A solution for enhancing artifact recovery and maximizing horizontal rather than vertical exposure is to use a power driven garden tiller to prepare the soil for surface collection. By using this technique during a recent testing program conducted in the Ouachita Mountains of Arkansas, controlled surface collections comprising a 10 percent sample of each of five wooded sites were successfully undertaken. The method is cost efficient, and the principal value lies in the extensive horizontal exposure usually attainable only in plowed fields or with large scale excavations. (51)

Thomson, Margaret (see Collins, Susan) (3)

Tiedemann, Clifford E. and Bruce G. Gladfelter (Illinois-Chicago Circle) A COMPUTER PROGRAM FOR EVALUATING SPATIAL ARCHAEOLOGICAL DATA Archaeological prospecting and surveying generate spatial numerical data that have been evaluated by a variety of statistical and/or computer mapping techniques. Interpretation of the data displays from an archaeological point of view necessarily involves subjective decisions, particularly in the case of remotely derived electromagnetic measurements. A computer program has been developed for assessing the significance of variations of individual data points within an overall grid network, thereby isolating anomalous values within the data field. Application of the program makes no assumptions regarding the theoretical basis for the derivation of the raw data, but simply evaluates the spatial pattern of numerical values, and thus it can be used to interpret phosphate survey data or artifact distributions as well as remote sensing data. (5)

Tiedt, Glenn F. (Heritage Conservation and Recreation Service) FEDERAL INCOME TAX CONSEQUENCES OF GIFTS OF ARCHAEOLOGICAL RESOURCES Traditionally, archaeological sites have been acquired almost exclusively through purchase with public and private funds. This paper will explore the Federal income tax incentives for landowners to donate either a fee simple absolute interest or a less than fee interest such as a conservation easement in such sites to qualified organizations. The paper will also explore the concept of bargain sales. The purpose of this paper will be to make the archaeological communities aware of the opportunities to protect sites through gifts by landowners and to encourage archaeologists to seek assistance from a qualified organization such as The Archaeological Conservancy or the Heritage Conservation and Recreation Service whenever an appropriate opportunity is encountered. (21)

Tieszen, L. L. (see Zimmerman, L. J.) (36)

Tirrell, Peter B. (Oklahoma) MUSEUM-SCHOOL ARCHAEOLOGY PROGRAMS Basic Archaeology is a "hands-on" experience developed by the Stovall Museum and presented to more than 2,200 6th grade Oklahoma students in the past 4 years. The program is planned by museum educators, professional archaeologists and social science teachers utilizing museum resources and existing school curricula. Activities include preparatory and follow-up discussions and media, excavation of a simulated site, identification and interpretation of artifacts, tool use and food preparation, and demonstration of tools and weapons. This program is an effective teaching tool, especially appropriate for imparting the methods, concepts and values of archaeology to young people. (22)

Todd, Lawrence C. (New Mexico) PATTERNS IN THE DISTRIBUTION OF SITES WITHIN A HISTORIC SETTLEMENT SYSTEM The archaeological evidence of a seasonal pattern of transhumance as practiced as part of a historic ranching system in northwestern Wyoming is examined. The presentation of information on the distribution and interrelationships of a single site type (shepherd camps) is used to illustrate some of the basic characteristics of such a settlement system. It is argued that an examination of historic settings where we can control variables such as seasonality, number of occupants, resources exploited, and length of occupation will allow a more informed investigation of the range variation in other variables such as site size, placement, and structure. (4)

Torres M., Luis (see Mountjoy, Joseph B.) (41)

Townsend, Alex H. and Daniel G. Roberts (John Milner Associates) PROBLEMS IN ARCHAEOLOGICAL MODELING AND SAMPLING IN PHILADELPHIA This paper focuses upon a discussion of archaeological predictive modeling and sampling in Philadelphia based upon data recovered during two recent investigations. Accurate prediction of urban archaeological resources is shown to be dependent upon a number of informational sources, such as historic maps, city ordinances, tax records, knowledge of percolation factors and existing basement depths. A number of methodological problems often arise, however, when an attempt is made to test such models through sampling and excavation. In typical urban investigations probabilistic sampling is often not possible due to problems of limited access created by such factors as lack of structural integrity, water seepage, or delayed tenant evacuation. The problems noted in this paper are thought to have applicability not only in Philadelphia, but also in a wider range of urban settings. (49)

Tringham, Dr. Ruth E. (UC-Berkeley) RESEARCH DESIGN AND PLANNING BEHAVIORAL ANALYSIS The lack of interplay between general theories of behavioral change in prehistory and empirical hypotheses to test these is a feature not only of Old World archaeology, but of archaeology in general, as has been pointed out in a number of recent studies. We are very conscious of this problem in the excavation and analysis of data from the Neolithic site of Selevac, Yugoslavia. This project has developed a series of middle range studies of ceramics, lithics, metals, etc., to investigate the socioeconomic transformations of agricultural societies in Southeast Europe in the 5th to the 4th millennium B.C. (14)

Trinkaus, Kathryn Maurer (Pennsylvania) THE PARTHO-SASSANIAN FRONTIER: SETTLEMENT IN NORTHEAST IRAN Emphasis on central organizations in studies of complex societies not only masks the role of frontiers in evolutionary change but overlooks the diversity of administrative arrangements crucial to boundary maintenance. Although strong bureaucratic organizations developed in Iran between 250 B.C. and A.D. 641, settlement, ceramic and literary data concerning the Damghan plain (northeast Iran) suggest that control over this outlying region operated through local structures rather than directly through an appointed bureaucracy. Thus, the centralized view misrepresents the flexibility essential to maintenance of bureaucratic states and demonstrates the need to incorporate internal variability in definitions of evolutionary processes. (30)

Trombold, Charles D. (Zacatecas) THE PRESENT STATUS OF ARCHAEOLOGY AT LA QUEMADA—PAST, PRESENT, AND FUTURE RESEARCH The results of recent research in the La Quemada region are summarized and discussed. Topics covered are gross physiographic and cultural realms, ecological zones, potential subsistence procurement systems, settlement locations, site sizes, settlement hierarchy and functional content, and gross population estimates as well as certain aspects of the material culture. Special attention is given to the cultural landscape (relative location of settlement types, prehispanic roadways, terraces, and possible small irrigation canals). The results of preliminary locational analysis regarding rank-size and distribution of sites are presented, and research strategy for future work is discussed. (53)

Trow, Tom (Minnesota Historical Society) AN ARCHAEOLOGICAL SURVEY OF MINNESOTA'S

"DRIFTFLESS AREA" Examination of the Root River watershed by the Statewide Archaeological Survey produced surprising information about prehistoric movements and patterns of land-use in this distinctive portion of the state. Data from an intuitive testing procedure and from a stratified random sample using 40-acre plots are examined. Although some Paleoindian materials are present, many of the most intriguing finds relate to the Oneota occupation of southeastern Minnesota's deep river valleys and hardwood forests. (23)

Trubowitz, Neal L. (Arkansas Arch. Survey) SITE FILES AND PUBLICATIONS: REFLECTIONS OF RESEARCH The accomplishments of the Arkansas Archeological Survey may be measured by examining the growth of state site files and the major in-state publication outlets. By comparing these records to the locations of past and ongoing investigations, trends and deficiencies in areal research and the dissemination of data are made evident. Comparisons are also made between the Survey and other organizations that have done archeological research in Arkansas, and projections are made for the use of these data for research planning and resource management. (42)

Tucker, Alice E. (see Palmer, Patricia G.) (3)

Tull, Travis A. (see DuBois, Robert L.) (11)

Turnbaugh, Sarah P. (see Turnbaugh, William A.) (43)

Turnbaugh, William A. (Rhode Island) IS THERE STILL A PLACE FOR THE AMATEUR IN ARCHAEOLOGY? Professional archaeology is frustrating some serious amateurs. Survey data from a major archaeological association indicate that, though existing avenues of cooperation are recognized, nonprofessionals frequently feel excluded from current research, even that based in part upon their collections, notes or sites. Other expressed grievances include limited opportunities to participate in sponsored projects, particularly for nonstudents; professional reports that seldom are directed at or readily available to amateurs; displacement of nonprofessionals from programs, publications and executive positions within their own organizations; professionally-endorsed antiquities legislation that seems to threaten amateur collections and future opportunities for fieldwork. The discipline must cultivate serious amateurs as allies or lose them as adversaries. (22)

Turnbaugh, William A. and Sarah P. Turnbaugh (Rhode Island) CHARACTERIZATION OF SOUTHERN NEW ENGLAND SOAPSTONES This paper discusses analyses of major elements and rare earth elements in soapstones from several southern New England quarries known to have been utilized in aboriginal times. Discarded soapstone artifacts collected from some of the quarries are also being analyzed and compared to the outcrop samples. Analytical techniques include petrography of thin-sections, atomic absorption spectrophotometry, and instrumental neutron activation analysis. This preliminary work on both quarry samples and associated artifacts serves as a basis for future considerations of soapstone procurement patterns and artifact distributions in prehistoric southern New England. (43)

Turner, B. L., II (Clark) RAISED-FIELD AGRICULTURE AND ENVIRONS AT PULLTROUSER SWAMP Pulltrouser Swamp is an inundated depression typical of bajo/depressions in the central Maya lowlands in terms of soils and hydrology. Recent studies indicate that as much as 6.6 km<sup>2</sup> of the depression may be composed of raised fields and canals that date to the Late Preclassic and Classic periods. Typologies and structures of the fields are discussed. The fields apparently functioned much like highland chinampas. Water control in the fields may have been manipulated by canals that connect the depression with the New River. Natural formation of the fields is highly unlikely in this habitat. Some major implications of these fields are examined. (8)

Tyler, Richard (Philadelphia Historical Commission) URBAN ARCHAEOLOGY AND HISTORIC PRESERVATION IN PHILADELPHIA This paper discusses, from a management perspective, numerous concerns relating to archaeology and preservation efforts in Philadelphia. A need is seen for more rigorous compliance with cultural resource legislation, more interpretation of archaeological work with historical problems and concerns, more correlation between empirical archaeological data and historic documentation, and more rigorous interpretive analyses, rather than descriptive analyses, in future archaeological work in Philadelphia. Of particular importance is the need for better and more advanced planning with regard to Philadelphia archaeological resources. It is believed that only with the involvement of archaeological input and planning in advance of project-specific design by urban planners, engineers and developers will we be better able to ensure the adequate recording and preservation of archaeological resources in Philadelphia and other urban areas. (49)

Ulrich, K. R. (see J. E. Ericson) (26)

Upham, Steadman, Jeffrey L. Hantman, Kent G. Lightfoot and Jill Neitzel (Arizona State) **SPATIAL ORGANIZATION OF THE CLASSIC HOHOKAM** In several recent papers it has been suggested that the Hohokam developed a complex, hierarchically ranked political organization during the Sedentary and Classic periods. Such arguments have been based on both the structure of particular sites and on regional settlement distributions. This paper expands on these findings through the use of locational techniques. Network analysis, rank-size and other spatial statistics are used to assess settlement distributions in the Lower Salt and Gila River valleys. An alternative model focusing on autonomous political hierarchies and status differentiation is presented to account for the development of the Classic period Hohokam system. (36)

Urban, Patricia A. (Pennsylvania) **PRECOLUMBIAN SETTLEMENT IN THE NACO VALLEY, NORTHWESTERN HONDURAS** Recently completed survey and excavation have disclosed settlements from period equivalent to the Classic and Postclassic, with some evidence for Preclassic occupation. The valley seems distinctive from other regions of Honduras, e.g., the Sula plain; moreover, the "collapse" seen at nearby Copan is not evident here. Rather, a profound change in settlement configuration, location and construction seems datable to the Mid-to-Late Postclassic. Further analysis will clarify various processes operating prehistorically, such as the growth and development of regional settlement systems and interactions between the valley and periphery-wide trade and communications networks. (39)

Urton, Gary (Colgate) **ETHNOGRAPHIC AND ETHNOHISTORIC ANALOGIES FOR ASTRONOMICAL ICONOGRAPHY IN PRECOLUMBIAN PERU** Recent ethnoastronomical fieldwork among Quechua-speaking Indians of the Peruvian Andes allows several fundamental orientational, classificatory and formal principles and structural patterns to be discerned. These are directly related to the organization of subsistence activities; i.e., astronomical cycles and periodicities are integrated with the primary agricultural and pastoral cycles of activity. Many of the same perceptual and classificatory principles of contemporary Quechua astronomy and cosmology are found in the ethnohistorical record relating to the Colonial Quechua and in the iconographic record of Precolumbian Andean cultures. (46)

Valdez, Fred, Jr. (see Adams, R. E. W.) (18)

Van Asdall, Willard, Annita Harlan and Charles H. Miksicek (Arizona) **BOTANICAL AND ENVIRONMENTAL STUDIES AT CIHUNTAN** During the University of Calgary's initial field season at Cihuatan, several major microhabitats and land use patterns within 1.5 km of the site center were identified. Although little or no pristine vegetation remains, remnants occur in several microhabitats. These suggest a semihumid tropical deciduous forest in upland sites with an attenuated tropical evergreen rainforest along drainages and streams where plentiful ground water compensates for atmospheric aridity during the prolonged dry season. Plant collections, flotation results, data from informants and historical documents. (59)

Van Asdall, Willard (see Miksicek, Charles H.) (59)

Van der Leeuw, Sander E. (Amsterdam) **CHANGES IN THE ORGANIZATION OF MANUFACTURE AND TRADE** It is argued that systems of production and exchange are best studied by considering the material, energetic and informational aspects together. From an organizational (information) point of view, one applicable model might be the "dissipative structure" model of thermodynamic behavior (Prigogine, 1978, et al.), which argues for nonreversible and abrupt, rather than evolutionary, changes in structure. In the model, the moment of change is—*theoretically*—predictable, but its nature is not. Such prediction requires measures of the amount of information processed and the information processing capacity. In the paper, such measures are developed and several examples of transition between systems states are addressed. Pottery manufacture and trade is the system considered. (26)

Van Zelst, Lambertus (see Bishop, Ronald L.) (56)

Vickery, Kent D. (Cincinnati) **THE ARCHAIC-WOODLAND TRANSITION IN THE CENTRAL OHIO VALLEY: AN EXAMPLE OF "UPWARD COLLAPSE"?** Examined with archaeological and paleoecological data from the central Ohio Valley is Winter's hypothesis that subsistence crisis brought about by fluctuations in the availability of staple wild food resources led to competition and ultimately to the demise of certain Late Archaic cultures in the Midwestern U.S. The possible relevance of Binford's general model of incipient cultivation to the resulting Archaic-Woodland transition in this area is also considered. Derived from these theoretical applications is a model with testable propositions that relates changing environmental conditions and a diminishing

food supply to the beginnings of food production and emerging forms of sociocultural complexity consonant with the concept of an "upward collapse." (23)

Viel, R. (see Willey, Gordon R.) (39)

Vicsek, David T. (Northern Illinois) and William L. Fash (Proyecto Arqueologico Copan) **THE COPAN-QUIRIGUA CONNECTION: SETTLEMENT PATTERNS IN THE OUTLYING REACHES OF COPAN** A walking survey emphasizing wide areal coverage and surface collections is incorporated in the body of known data regarding settlements of the Copan River drainage. Factors of topography, proximity to water sources and cultivable land, and routes of access are considered in attempts at explaining settlement patterns, and the sites are compared in size, layout and placement with the sites mapped and tested within the Copan pocket. Possible routes of communication and/or trade with Quirigua are examined, and the settlement characteristics are used to frame hypotheses regarding the nature of interaction between the two sites. (39)

Voorhies, Barbara (California-Santa Barbara) **RESEARCH REPORT ON THE SOCONUSCO PREHISTORY PROJECT** The 1978-79 season focused on the acquisition of basic archaeological data within a virtually unstudied region (approximately 650 sq km) of the coastal lowlands of Chiapas, Mexico. Approximately 100 sites were located using a combination of reconnaissance methods and the analysis of surface-collected ceramics. This work documents a continuous regional occupation from the Early Preclassic Period to the Colonial Period. Using these data, the paper will formulate hypotheses about site functions, settlement locations, and economic interactions. These hypotheses will be tested in future research involving excavation at selected sites. (34)

Voss, Jerome A. (Michigan State) **THE MEASUREMENT AND EVALUATION OF CHANGE IN THE REGIONAL SOCIAL NETWORKS OF EGALITARIAN SOCIETIES: AN EXAMPLE FROM THE NEOLITHIC OF NORTHWESTERN EUROPE** A model of change in egalitarian social organization is evaluated with data from the Western-TRB period of northwestern Europe. Trends in intersite pottery design similarity support the conclusion that the increased significance of regional social networks associated with tribal organization can be understood as a response to increased environmental variability accompanying subsistence shifts to food production. The appropriateness of different measures of regional interaction intensity is discussed. Measures of intersite design similarity based upon continuous design attributes are apparently more appropriate as indicators of interaction intensity than are measures based upon design element frequencies. (58)

Voytek, Barbara A. (UC-Berkeley) **ANALYSIS OF CHIPPED STONE ASSEMBLAGES AND MICROWEAR** Approaches to chipped stone analysis employed in attempts to elucidate past human behavior are briefly reviewed. Incorporating microwear analysis in research designs is discussed as a way of improving the results of such approaches. The pros and cons of this technique are examined with reference to a specific case study—a Late Neolithic site in Yugoslavia. Results of the current study are compared to those from other microwear projects in an attempt to clarify the role which microwear can and should play in chipped stone analysis. The conclusions largely present questions or problems which microwear analysis can help answer. (14)

Vreeland, James M., Jr. (Austin) **COTTON CRAFTS AND CULTS: A NORTH COAST SURVIVAL** Recent ethnographic studies of traditional north coast cotton growers and artisans provide an overlooked substrate for investigating continuities in aboriginal fabric production. A participant survey of about 100 household artisans has indicated that north coast fabric technology is distinct from highland forms, frequently employed as an "interpretation" of prehistoric coastal behavioral patterns in general. Continuities in indigenous textile techniques are evaluated on the basis of yarn and fabric attributes, design and function. Surviving aboriginal terms for several aspects of textile production further differentiate a basic north coast pattern from those of adjacent coast and highland regions. (46)

Wadleigh, William M. (Connecticut) **PREHISTORIC SETTLEMENT AND SUBSISTENCE IN THE HIGHLANDS OF NORTHEASTERN CONNECTICUT** Traditionally, models of prehistoric subsistence and settlement in southern New England have considered areas outside of major river valleys and the coast as peripheral zones utilized for seasonal hunting forays. Several seasons of survey in the highlands of northeastern Connecticut indicate that these models should be reevaluated. Based upon new data, hypotheses are presented which predict that the highlands were capable of supporting a year-round settlement-subsistence system, particularly during the Late Archaic period. (29)

Wagner, Gail E. (Washington-St. Louis) and Orrin Shane (Science Museum-Minnesota) **FORT AN-**

CIENT SUBSISTENCE IN SOUTHWESTERN OHIO Results of analyses of the floral and faunal remains from the Incinerator site, an Anderson Phase/Fort Ancient stockaded village in southwestern Ohio, are presented. These data enable one of the most complete accounts now available of subsistence and associated technology in a Fort Ancient village. Although occupied year-round, quantitative analysis of deer remains suggests that the number of individuals actually present at Incinerator varies, depending on the season. Because the village was occupied for a relatively short span (perhaps 50 years), one can also examine social differences as reflected in the plant remains. (40)

Walt, Walter K. (National Park Service) SAN JUAN BASIN DATA BASE The San Juan Basin Archaeological Data Base computer program allows interactive communication with a set of 21,000 archaeological records. The program, developed by the National Park Service Branch of Indian Cultural Resources, Santa Fe, New Mexico, is updatable, produces graphic output, and is responsive to requests for archaeological data for any given point within the 25,000 square mile study area. Current use and future growth of the data base is discussed. The data base's use in hypotheses and theory development is demonstrated. (6)

Walsh, Michael R. (UCLA) THE CLASSIFICATION OF TOPOGRAPHY: A STRATIFIED UNIVERSE The classification of topography is presented as an effective means for regional stratification. Specific classes of topography that have been distinguished on the Pajarito Plateau in New Mexico are explicated, and are shown to have varying degrees of site density and diversity. Based on this variability, differential sampling strategies are employed for each class of topography. This method of topographic stratification is set into the context of an effective running analysis and is argued to greatly facilitate large-scale regional archaeology. Emphasis is placed on the practical application of this method to a variety of regional research problems. (16)

Watkins, Joe E. (Interagency Archeological Services-Atlanta) THE ROLE OF NATIVE AMERICANS IN THE DEVELOPMENT OF THE INTERAGENCY ARCHEOLOGICAL SERVICES' "POLICY FOR THE DISPOSITION OF HUMAN REMAINS" This paper documents the development of the Interagency Archeological Services burial policies through: (1) a generalized discussion of the various ways Native Americans view human skeletal remains and their disturbance, (2) the classes of information available from human interments, (3) various examples of burial policy, (4) comments on that policy (both professional and Native American), (5) a discussion of the revised Interagency Archeological Services' burial policy in terms of requirements and constraints, and (6) the role of Public Law 95-341 in the burial policy formulation. (45)

Weakly, Ward F. (Water and Power Resources Service) THE WATER AND POWER RESOURCES SERVICE AND ARCHEOLOGY IN THE 1980s The Water and Power Resources Service, by its assumption of that title to replace the name Bureau of Reclamation, specifically had recognized the importance of its role in energy development and production in the future. A number of studies and new programs are anticipated by the agency concerning developments in hydroelectric power, wind energy, and the provision of water to other energy developments. One of the major anticipated results of those studies will be a reduction of new impacts on other cultural resources especially historic engineering structures as modifications are made to increase their efficiency. (44)

Weakly, Ward (see Madden, Lou) (31)

Webster, Gary S. (Penn State) OPTIMAL HUNTING IN THE TEHUACAN VALLEY: A NON-EQUILIBRIUM APPROACH TO THE STUDY OF ECONOMIC CHANGE Optimal foraging models offer an alternative approach to the study of temporal changes in the resource exploitation strategies of prehistoric communities. This paper examines the evolution of hunting patterns in the Tehuacan Valley from an optimal foraging perspective. Temporal variations in prey selection, seasonality of hunting, and prey capture and preparation methods suggest a history of increasing intensification of animal exploitation by the valley hunters in response to a generally declining animal resource base and growing demands. These conclusions are discussed with reference to Flannery's (1968) systems model of agricultural origins in Mesoamerica. (34)

Weigand, Phil C. (SUNY-Stony Brook) THE EXTENT OF THE TEUCHITLAN TRADITION The core area of the Teuchitlan tradition was the highland and barranca zones of northwest and north Jalisco and east Nayarit. Its roots were in the more generalized Formative cultures of Jalisco, Nayarit, and possibly Colima, which were characterized by complex shaft tombs. By the Late Formative, the differential development of the Teuchitlan-Etztatlan-Tequila region is evident. By the Middle Classic, ca. A.D. 400-700, a remarkable population implosion had concentrated most settlements into six large habitation zones. One zone, at Teuchitlan, exhibits primitive urban characteristics. The entire area was totally reorganized during the early Postclassic. The

Teuchitlan tradition's territorial extent, settlement pattern, and exotic circular architecture, at various stages of development, are discussed. (41)

Weindrich, Bruce (see Bass, T. A.) (57)

Weiss, M. (see Beidleman, D. Katharine) (57)

Weymouth, John (see Huggins, Rob) (31)

Wheeler, R. (see Beidleman, D. Katharine) (57)

Whitcotton, Stephen R. (Southern Illinois-Carbondale) BASKETMAKER II SITES ON BLACK MESA, ARIZONA Since 1977, one of the major emphases of the Black Mesa Archaeological Project, located on Black Mesa in northeastern Arizona, has been an increased understanding of Basketmaker II sites. Although typically found in rockshelter proveniences in the Anasazi area, on Black Mesa these sites occur in the open. Characteristics of open Basketmaker II sites will be discussed. Results of multivariate tests that may indicate subsistence/settlement patterns will be presented. Basketmaker II manifestations on Black Mesa will be compared to others in the Anasazi area. (54)

Whitlam, Robert G. (Washington) TOWARDS A COMPARATIVE UNDERSTANDING OF SETTLEMENT-SUBSISTENCE STRATEGIES IN COASTAL ENVIRONMENTS: PRELIMINARY SYSTEMATICS AND APPLICATION The recent focus of coastal research had emphasized the comparative study of settlement-subsistence strategies in coastal environments. While coastal archaeologists are rapidly moving towards a global orientation, the basic analytical units are still predominately defined on the basis of local stylistic criteria hindering broad scale comparative research and synthesis. A solution to this problem involves the creation of analytical units independent of but applicable to local data sets. A paradigmatic classification of settlement-subsistence system types is developed and its application to the archaeological record is discussed. (50)

Widmer, Randolph J. (Penn State) SOCIO-POLITICAL IMPLICATIONS OF A TROPICAL SEDENTARY ESTUARINE ADAPTATION: A SOUTHWEST FLORIDA EXAMPLE The 16th-century Calusa of southwest Florida is characterized as being a large, sedentary, complex chiefdom. This is accomplished with a hunting and gathering economy utilizing highly productive and continuously available tropical coastal resources. A hierarchical political system is seen as a necessary mechanism to minimize risk factors and even out differential productivity characteristic of this environment. The political centers of this adaptation correlate with two areas of extremely high productivity. A large, sedentary population cannot be supported in this environment without this level of sociopolitical development. (50)

Wilkie, Duncan C. (Southeast Missouri State) DIACHRONIC CHANGES IN SETTLEMENT PATTERNS: NEAREST NEIGHBOR ANALYSIS A portion of the Cuyahoga River Valley that drains into Lake Erie is used to examine the changes in spatial distribution from Early Woodland (500 B.C.-A.D. 200) into the Whittlesey (A.D. 1250-1650) cultural period. Data on 175 sites with 183 identified cultural components were collected between 1976 and 1978. The function of each component was established by using burials, earthen structures, ceramics and other occupational variables. Each cultural period was computed for nearest neighbor values, and from this analysis spatial distribution varied not only between major cultural periods, but also between sites with different functions within a settlement pattern of a period. (36)

Willey, Gordon R. (Harvard), R. J. Sharer (Pennsylvania), R. Viel (Proyecto Arqueológico Copan), A. Demarest (Harvard), R. Leventhal (Harvard), E. Schortman (Pennsylvania) A STUDY OF CERAMIC INTERACTION IN THE SOUTHEASTERN MAYA PERIPHERY The paper discusses the results of two conferences held to compare the ceramic data from a series of sites located in the southeast Maya area (Copan, Quirigua, Chalchuapa and Santa Leticia). The studies were based upon side by side comparisons of typological and form classes from these sites, supplemented by compositional paste analyses. The temporal and spatial patterning revealed are seen to reflect economic and sociopolitical interaction within this area. Shifts in this patterning appear to reflect changes in political and economic networks and are seen to be consistent with other reconstructions of prehistoric development in the southeast Maya area. (39)

Williams, Lorraine E. and Shirley S. Albright (New Jersey State Museum) LITHIC UTILIZATION IN THE MIDDLE WOODLAND OCCUPATION OF THE ABBOTT FARM SITE Lithologic analyses (color, grain size, grain fusion, and inclusions) applied to the temporally diagnostic lithic artifacts (largely projectile points and knives) from the third humus stratum, lowland section, of the Abbott



Farm Site results in preliminary differentiation of gross petrography. Further distinctions among detrital and chemical argillites, their hornfelsed equivalents and hornfelsed shales and mudstones can be arrived at through X-ray diffraction, a form of mineralogical analysis. Correlation of resulting identifications of rock type with archaeological typological and functional classifications provide information concerning lithic utilization by prehistoric populations occupying the Abbott Farm Site area during the Middle Woodland times. (48)

Williams, Lorraine E. (see Albright, Shirley S.) (43)

Windes, Thomas C. (National Park Service) ARCHAEOMAGNETIC DATING: LESSONS FROM CHACO CANYON, NEW MEXICO Recently, there has been an increased interest in and use of archaeomagnetic dating in the Southwest. The method has tremendous potential not offered by other dating methods, but unfortunately few archaeologists understand its potential or limitations. Archaeologists have rushed to secure their own samples, with some lamentable results. Lack of sampling experience, poor equipment, and lack of communication between archaeologists and the labs have led to problems that threaten refinement of the technique. The causes of some of the more critical problems are pointed out and reasons for the relatively good success of archeomagnetic dating in Chaco Canyon are discussed. (11)

Wing, Elizabeth S. (Florida State Museum) ANIMAL USE AS ONE ASPECT OF EARLY COASTAL ADAPTATION Three sites from the coasts of northern Peru (PV22-12/U7 and PV7-19) and southern Ecuador (OGSE 80) have associated faunal remains that provide information on animal use between 10,000 and 5000 B.P. These data indicate that both terrestrial and marine resources were used, presumably for food, and that one animal—the fox *Dusicyon sechurae*—had other cultural significance. This evidence of early animal use is compared with similar data from later sites of the same area. (15)

Winn, Shan M. (Southern Mississippi) and Daniel Shimabuku (St. Mary's) RESPONSES TO DETERIORATING AGRICULTURAL CONDITIONS AT BROTTA SCALORIA, SOUTHEASTERN ITALY, DURING THE NEOLITHIC Adjustment in the subsistence base of the farming population at Scaloria cave is indicated by a shift to hunting, shown by tools and an increased reliance on wild animals. A developing agricultural crisis may be inferred: discoveries in more inaccessible passages suggest a water cult, related to climatic conditions and water shortage; mass burials provide skeletal evidence of disease and cannibalism; abandonment of the settlement is correlated with widespread desertion of sites throughout the region. (30)

Wise, Cara L. (Catholic) CHANGING COLONIAL SETTLEMENT PATTERNS IN DELAWARE'S COASTAL PLAIN The completion of comprehensive archaeological surveys in two areas of Delaware's Coastal Plain have made possible the development of an ecological or landscape-based model for early historic ritual settlement. Data on standing structures provides evidence of a shift in farmstead settlement patterns in the period 1720-1740, which is also associated with the development of the milling industry and the rise of towns. This change in settlement patterns can be related to changes in agricultural economy. (61)

Wiseman, Frederick M. (Louisiana State) POLLEN ANALYSIS OF RAISED FIELDS AT PULLTROUSER SWAMP, BELIZE Sediment samples from raised field structures and associated canals have yielded pollen of both cultivars and natural riparian and upland species, although many samples are sterile due to biotic and chemical degradation. Pollen of *Zea Mays* has been identified and cultivated cotton pollen may have been found also. Other recovered pollen types suggest little significant change in the upland flora. Associated project data from mollusca and macro-flora studies will also be presented. (8)

Wolfman, Daniel (Arkansas Arch. Survey) ARCHAEOMAGNETIC DATING IN ARKANSAS AND THE BORDER AREAS OF ADJACENT STATES Recent archaeomagnetic research in Arkansas and the border areas of adjacent states indicates that the configuration of the polar curve for the approximate time period A.D. 1200-1500 in this area is quite similar, but not identical, to the contemporaneous Southwest curve. Limited data suggest that the similarity existed in some earlier time periods as well. The archaeomagnetic dates thus far obtained from sites where ages were known by other methods for the most part agree remarkably well with the estimates made by the archaeologists who were in charge of the excavations. (42)

Wolync, Renata B. (Edinboro) TESTING CALDWELL'S "PRIMARY FOREST EFFICIENCY" CONCEPT USING FEATURE DATA FROM THE KOSTER SITE Several aspects of Caldwell's "primary forest efficiency" concept were tested by analysis of the 1970-72 feature population from the Koster Site. The results support the assumptions that during the Archaic there was a progressive increase in overall cultural complexity, in increase in the variety and specialization of tools,

cyclical reuse of settlement space, some degree of sedentism, and an increase in population size. However, the feature data indicate that certain of these characteristics occurred at Koster at least 1,000 years earlier and some at least 3,000 years earlier than predicted by Caldwell. (23)

Wonderley, Anthony (Cornell) POSTCLASSIC NACO, HONDURAS Naco is known to Mesoamericanists as one of the major trade centers destroyed by the Spanish conquistadors. Archaeologic work at that site suggests a rapid transition from village to trade community. Naco's commercial prominence is associated with the initiation of a transisthmian trade corridor across Honduras and the arrival of several foreign groups of Mexican derivation. The research documents a substantial movement of goods, peoples, and ideas in the southern periphery of Protohistoric Mesoamerica. (39)

Woodall, J. Ned (Interagency Archaeological Services/Wake Forest) and Jane G. Evans (Interagency Archaeological Services/Washington) ANOTHER CRISIS IN NORTH AMERICAN ARCHAEOLOGY Problems relating to the curation and storage of archaeological materials collected in the course of federally sponsored data-recovery projects will be discussed. An intensification of the problem is anticipated from programs to mitigate the adverse effect of increased surface mining, a result of current energy policy. Brief discussions of present repository conditions and of the development of the repository/curation crisis will be followed by a discussion of proposed solutions. Much of this discussion will be based upon the results of the IAS sponsored pilot study on the curation and management of archaeological collections. IAS views of these proposals will also be discussed. (44)

Wylie, M. Alison (SUNY-Binghamton) ANALOGICAL ARGUMENT IN ARCHAEOLOGY In connection with their commitment to a scientific methodology, New Archaeologists have severely criticized traditional research in which loose analogical interpretations of the data, accepted on conventionalist grounds, stand as the final conclusions of investigation. As a program has developed, an extreme position has been adopted whereby all analogical argument is, ideally, relegated to the prescientific context of discovery while the properly scientific arguments of explanation and confirmation are held to be deductively structured and empirically "validated." This paper argues that analogical inference figures centrally in scientific contexts. It will also show, that in acknowledging the role of analogy in explanation and confirmation, the field is not necessarily abandoned to uncontrolled speculation. A set of formal and empirical criteria will be described by which the strength, if not the validity, of analogical arguments may be (and, in practice, generally is) evaluated such that the use of analogy may be made to conform to the New Archaeology's demands for rigorous empirical control and testing. (16)

Yamate, Carol L. (Washington) MATHEMATICAL MODELS IN ARCHAEOLOGY: A CRITICAL LOOK AT SPETH'S MECHANICAL BASIS OF PERCUSSION FLAKING Mathematical modeling can play an important role in archaeological theory building. However much of the past use has been uncritical. Little attention has been paid to the goals and restrictions of the model, to concepts, to relationships among and manipulation of variables, or to dimensions. These problems are examined in light of Speth's mathematical model of spalling. It is shown that: (1) inappropriate uses of concepts, equations, and dimensions exist; and (2) important differences in the outcome of the application of Speth's model result when alternative solutions are presented. (37)

Zavaleta, Anthony N. (see Paull, Gene J.) (34)

Zeder, Melinda A. (Michigan) ANIMAL RESOURCE DISTRIBUTION AND URBAN DEVELOPMENT IN SOUTHERN IRAN Central to the problem of urbanism are developments involving specialization and coordination of economic relations. These developments include production, product movement and distribution. Faunal material from Tal-e Malyan is analyzed with the aim of examining early urban economic relations as manifested by changes in animal resource distribution. Three related topics are addressed: (1) theoretical concepts of urban economic relations as related to Near Eastern animal resource distribution, (2) methods by which faunal data may be used to monitor these systems, and (3) illustrative examples of results obtained from Malyan faunal analysis. (7)

Zeidler, James A. (Illinois) ETHNOARCHAEOLOGY OF AN ACHUAR DWELLING: SOME ARCHAEOLOGICAL IMPLICATIONS This paper presents the results of ethnoarchaeological research carried out among the Achuar, a Jivaroan-speaking group of eastern Ecuador. It examines domestic proxemics and the flow of material culture items within the large, multifamily, Achuar dwelling as a means of elucidating the nature of cultural "formation processes" responsible for the deposition of artifacts and other cultural material on archaeological house floors. Various implications of this research are then discussed with regard to the analysis and inter-

pretation of the spatial dispersion of cultural material on house floors from the Valdivia site of Real Alto (OGCh-12), in southwest coastal Ecuador. (61)

Zimmerman, L. J. (South Dakota) S. Archer (Colorado State) and L. L. Tieszen (Augustana) **ECOLOGICAL CHARACTERIZATION AS A FOUNDATION FOR PREDICTION OF PLAINS VILLAGE TRADITION SITE LOCATIONS IN CENTRAL SOUTH DAKOTA** Upland Plains village archaeological sites in Central South Dakota located by pedestrian survey were described in terms of physiography and vegetation. Randomly selected, nonarchaeological sites were similarly described and served to define the universe of sites available for habitation along the east bank of the Missouri River/Lake Francis Case Reservoir. Physiographic differences between actual and "simulated" archaeological sites suggested that several factors were important in predicting the location of upland archaeological sites. (36)

Zurel, Richard L. (Oakland) **WOODLAND AND HISTORIC ABORIGINAL PATTERNS IN SOUTHEASTERN MICHIGAN** Initial occupation is along the Detroit waterway ca. A.D. 500. Items of exotic material are associated. A shift to inland settlement occurs ca. A.D. 1000, as exotic materials decrease and evidence of warfare increases, including presence of regularly spaced fortified sites. Woodland occupation terminates ca. A.D. 1400-1500, and the area is not reoccupied until establishment of a trading post in 1701. It is suggested that during peak periods of native trade, populations concentrated along major ecological edges. Southeastern Michigan may have been abandoned at times when strategically and economically better placed populations cut out this area's "middleman" role. (23)