C. L. CRUMLEY

# Program and Abstracts

## Society for American Archaeology

FORTIETH ANNUAL MEETING

Dallas, Texas

8, 9, 10 May 1975

Ann Tippett
4th Ab.

**Fortieth Annual Meeting**
**SOCIETY FOR AMERICAN ARCHAEOLOGY**

*Program Chairman*: S. Alan Skinner

*Program Committee*: Thomas R. Hester, Robert D. Hyatt, Harry J. Shafer

---

## OFFICERS
## OF THE SOCIETY FOR AMERICAN ARCHAEOLOGY

*President*: Charles R. McGimsey III

*President-elect*: Stuart Struever

*Secretary*: Richard E. W. Adams

*Treasurer*: Fred Wendorf

*Editor*: Frank Hole

*Executive Committee Members:* George L. Cowgill *and* George C. Frison (*to 1975*)
Richard I Ford *and* Patty Jo Watson (*to 1976*)

## GENERAL INFORMATION

**Abstracts** Abstracts of papers presented at this meeting are included in the Program. Additional copies are available for $1.50 per copy at the Membership Services Desk in the lobby, or may be ordered prepaid from the Society, 1703 New Hampshire Avenue, NW, Washington, DC 20009.

**Advance Registration** Members who pre-registered by April 15 should claim their badges and Programs at the ADVANCE REGISTRATION DESK in the lobby.

**Business Meeting** The Society's annual business meeting will be held at 5 p.m. on Friday in the Grand Ballroom.

**Convention Office** Members of the Program Committee will be available in the Seville Room. Any problems or special requests during the meeting should be reported to the committee office.

**Exhibits** Publisher's exhibits will be on display in the Emerald Room from 4 p.m. to 9 p.m. Wednesday, 11 a.m. to 7 p.m. Thursday and Friday, and 9 a.m. to noon on Saturday.

**Lounge** The Terrace Room has been set aside as an informal meeting place from 4 p.m. to midnight Wednesday, and from 8 a.m. to midnight Thursday through Saturday.

**Luncheons** Tickets for Table Talk, which will be held on Friday at noon to 2 p.m. in the North Rose Room, may be purchased at the Advance Registration Desk.

**Membership Services and Publications** A desk will be maintained in the registration area in the lobby from 4 p.m. to 9 p.m. on Wednesday, 8 a.m. to 4 p.m. Thursday and Friday, and 8 a.m. to noon on Saturday for those who wish to purchase publications or enroll in the Society.

**Message Center** A self-service message center will be located in the lobby. This center should NOT be used for messages pertaining to the placement service.

**New Member Reception** A reception for new members and for those attending their first meeting, hosted by officers of the Society, will take place on Friday at 7:30 p.m. in the Florentine Room.

**Open House** An open reception (cash bar) to which everyone is invited will be held on Thursday from 5 p.m. to 6:30 p.m. in the Rose Room.

**Placement Service** For those who wish to register positions open or wanted, a placement service will be conducted in the Windsor Room from 4 p.m. to 9 p.m. on Wednesday, and 10 a.m. to 5 p.m. Thursday through Saturday. Message forms will be provided and assigned box numbers must be used for the placement service message center, which is available only to those who register with the service.

**Registration** A registration desk will be located directly across from the hotel's front desk in the lobby from 4 p.m. to 9 p.m. on Wednesday, 8 a.m. to 4 p.m. on Thursday and Friday, and 8 a.m. to noon on Saturday. Registration, which includes a copy of the Program and Abstracts, is required for attendance at all sessions.

**Restaurants and Lounges** Heidelberg Restaurant (street level): breakfast, lunch, dinner, 7 a.m. to 10 p.m.
Kings Club Lounge (lobby floor): lunch, 11 a.m. to 8 p.m.
Kings Club (6th floor): lunch, dinner, 11 a.m. to 1 p.m.

**Symposia and Session Chairmen** Please maintain the established schedule scrupulously. Note the use of the blackboard for listing speakers; do not collapse sessions if a scheduled speaker fails to appear.

## MEETING ROOM DIRECTORY

| | |
|---|---|
| Civic Room I | 9th Floor |
| Civic Room II | 9th Floor |
| Civic Room III | 9th Floor |
| Director's Room | 6th Floor |
| Emerald Room | 6th Floor |
| Florentine Room | 6th Floor |
| French Room | Lobby Floor |
| Grand Ballroom | Lobby Floor |
| Regency Room | Lobby Floor |
| Rose Room | 15th Floor |
| North Rose Room | 15th Floor |
| Seville Room | 6th Floor |
| Terrace Room | 6th Floor |
| Venetian Room | 6th Floor |
| Windsor Room | 6th Floor |



# PROGRAM

## THURSDAY MORNING, MAY 8

(1) Symposium: MATTERS AFFECTING STATE ARCHAEOLOGISTS
Grand Ballroom
Organizer and Chairperson: James J. Hester

9:00 Marshall McKusick, Introduction: The Changing Role of the State Archaeologist
9:30 Relationships of the State Archaeologist . . .
Ray Lyons, With Amateur Archaeologists
Robert L. Stephenson, With Professional Archaeologists
Ward F. Weakly and Lloyd Pierson, With State and Federal Agencies
Discussants: Adrian Anderson, Louis Wall
10:00 Implementation of the Moss-Bennett Act
Discussants: Lawrence E. Aten, William G. Haag
10:30 Innovative New Programs
James J. Hester, Archaeology and the Colorado Land Use Bill
Hannah Huse, Colorado's Cooperative Survey Project No. 1
Ronald A. Thomas, Delaware's Development Project Watchdog Survey
Discussant: David Madsen
11:00 Current Problems
George Zeimens, Wyoming's Problems in the Energy Crisis
William Mayer-Oakes, Coordination Within the Archaeological Profession
Discussant: Francis A. Riddell

(2) Symposium: ADAPTATION TO COASTAL RESOURCES
Civic Room III
Organizers and Chairpersons: Stephen L. Cumbaa and Rochelle Marrinan
Participants:

8:30 Kathleen Mary Byrd, Prehistoric Caribbean Fishing: A Zooarchaeological Analysis
8:50 Stephen L. Cumbaa, Coastal Resource Utilization and Cross-Cultural Dietary Change in the Spanish Colonial Period
9:10 Cailup B. Curren, Prehistoric Occupation of the Mobile Delta and Mobile Bay Area of Alabama
9:30 Tim A. Kohler, Subsistence and Settlement at the Garden Patch Site, Florida
9:50 Olga F. Linares, Different Uses of Marine Resources on the Pacific and Atlantic Coasts of Western Panama
10:10 Rochelle A. Marrinan, Coastal Adaptation in the Late Archaic
10:30 Charles Nelson, Barbara Luedtke, and David Braun, Coastal Adaptations in Boston Harbor
10:50 John S. Otto, From Caviar to Cats: A Comparison of Planter, Overseer, and Slave Diets from Cannon's Point Plantation (1794-1861), St. Simon's Island, Georgia
11:10 Stuart D. Scott, Human Paleo-Ecology in the Marismas: A Marginal Mesoamerican Culture
11:30 David R. Yesner, Maritime Hunter-Gatherers: Demographic and Paleo-demographic Models
11:50 Robert N. Zeitlin, Environment and Cultural Adaptation on the Southern Isthmus of Tehuantepec: The Preclassic Period
12:10 Judith Francis Zeitlin, Environment and Cultural Adaptation on the Southern Isthmus of Tehuantepec: The Classic and Postclassic Periods

(3) Symposium: RECENT EMPHASES IN LITHIC ANALYSIS
Regency Room
Organizer and Chairperson: Karen E. Stothert
Participants:

8:30 Errett Callahan, Flake Removal Sequence and Cultural Inference
8:45 Nancy Randall and Errett Callahan, Biface Thinning Flakes: Key Factors in Analyzing Platform Angles
9:00 Paul Brockington and Anta Montet-White, Mass Distribution and Shape Variation in Artifact Assemblages
9:15 Aileen F. Button and L. Lewis Johnson, Debitage Analysis: Archaeological and Experimental
9:30 Joel Gunn and William Korth, Knapper Variance: Physical and Psychological Dimensions of Variability in Flint Working
9:45 Clay A. Singer and Jonathon E. Ericson, Quarry Analysis
10:00 Barbara Luedtke, Lithic Materials and Social Boundaries
10:15 Paul Katz and Susanna Katz, A Lithic Analysis of the Settlement Pattern in the Lower Tule Canyon, Briscoe County, Texas
10:30 Karen E. Stothert, Continuities in the Early Lithic Tradition of Northwestern South America

10:45 Carl Phagan and Robert K. Vierra, Associational Patterning in Lithic Assemblages and Subsistence-Related Behavioral Strategies: A Peruvian Example
11:00 Barbara A. Purdy, Thermoluminescence Dating: Application of the Technique to Heat-Altered Florida Cherts
11:15 Jerry R. Galm
11:30 Henry T. Irwin and Guy R. Muto
11:45 Discussants: John Witthoft, William J. Mayer-Oakes, Cynthia Irwin-Williams, Guy R. Muto

(4) Symposium: CONFIRMATION IN ARCHAEOLOGY
French Room
Organizer and Chairperson: Joseph L. Chartkoff
Participants:
8:30 Merrilee Salmon, Philosophy of Archaeological Confirmation
8:50 H. David Tuggle, Return to Fundamentals in Methodological Issues
9:10 A. E. Rogge, Processual Archaeology and the Philosophy of Science: Three Problems
9:30 Dwight Read and Steven A. LeBlanc, Hypothesis Testing and the Deduction of General Laws
9:50 Michael B. Schiffer, Four Laws in Archaeology
10:10 J. Jefferson Reid, Behavioral Archaeology: Four Strategies
10:30 John M. Fritz, A Reactionary Speaks Out on Validation in Archaeology
10:50 Joseph L. Chartkoff, Great Questions and Opaque Hypotheses: Testing Inadequate Alternate Explanations for Agricultural Origins
11:10 Robert K. Evans, Craft Specialization in the Chalcolithic of Southeastern Europe: Tests of Hypotheses
Discussants: Patty Jo Watson, William Longacre, W. James Judge

(5) Symposium: MODELS AND GREAT BASIN PREHISTORY
Civic Room I
Organizer and Chairperson: Don D. Fowler
Participants:
9:00 Don D. Fowler, Models of Great Basin Prehistory: An Overview
9:20 James A. Goss, Linguistic Tools for the Great Basin Prehistorian
9:40 Peter J. Mehringer, Jr.
10:00 Catherine S. Fowler, Ethnographic Analogy and Great Basin Prehistory
10:20 Sheilagh Brooks and Richard H. Brooks, Physical Anthropology/Demography and Archaeology
10:40 David L. Weide and Margaret L. Weide, Time, Space, and Intensity in Great Basin Paleoecological Models
Discussants: David H. Thomas, C. Melvin Aikens, Stephen C. Jett, Peter J. Mehringer, Jr., George Armelagos

(6) General Session: GREAT BASIN
Civic Room I
Chairperson: C. Garth Sampson
Participants:
11:15 C. Garth Sampson, Lakeshore Adaptation at the Nightfire Island Site, Lower Klamath Lake
11:35 Joanne M. Mack, A Report on Ceramics from the Klamath River
11:45 Jesse D. Jennings, Archaeology of Sudden Shelter
11:55 Norman M. Whalen, Archaeological Survey in Southeastern Imperial County, California

(7) Symposium: REVIEWING MISSISSIPPIAN DEVELOPMENT
Civic Room II
Organizer and Chairperson: Stephen Williams
Participants:
9:00-12:00 Lewis H. Larson and Bruce Smith, Ecological Systems
Christopher Peebles and James Brown, Societal Variables
James B. Griffin and Stephen Williams, Chronology
Robert Hall and James Price, Process

## THURSDAY AFTERNOON, MAY 8

Noon LUNCHEON OF PAST PRESIDENTS
Directors Room
Charles R. McGimsey, Host

Noon LUNCHEON: MEETING OF THE AMERICAN SOCIETY FOR CONSERVATION ARCHAEOLOGY (ASCA)
William J. Mayer-Oakes (President)



(8) Symposium: RECENT RESEARCH ON THE EUROPEAN PALEOLITHIC
Regency Room
Organizer and Chairperson: Harvey M. Bricker
Participants:
1:30 Bruce G. Gladfelter, John J. Wymer, and Ronald Singer, The Contexts of the Clactonian at Clacton and Acheulian Industries at Hoxne, England
1:50 C. Garth Sampson, Late Acheulian Research at Caddington, England
2:10 Leslie G. Freeman, Cueva Morin and the Paleolithic of Northern Spain
2:30 Harvey M. Bricker, Les Tambourets: An Open-Air Chatelperronian Site in Southwestern France
2:50 Alison S. Brooks, Formal Analysis of Aurignacian Stone Tools in Southwest France
3:10 Michael B. Collins, Lithic Technology at the Abri Pataud and Laugerie-Haute, France
3:30 R. Berle Clay, The Significance of Attribute Variation: A View from the Proto-Magdalenian
3:50 Major C. R. McCollough, The Noaillian, Perigordian, and Gravettian Populations of the Western Pyrenean "Funnel" and Cantabrian Spain
4:10 James R. Sackett, Solvieux
4:30 Anta Montet-White, The Eastern Gravettian: A Case Study

(9) Symposium: ARCHAEOLOGICAL RESEARCH AND CULTURAL RESOURCE MANAGEMENT
Grand Ballroom
Organizers and Chairpersons: Don P. Morris and James T. Rock
Participants:
1:30 R. Gwinn Vivian, Student Training in Cultural Resource Management
1:45 Mark Grady, Archaeological Survey and the Future of Cultural Resource Management
2:00 Albert C. Goodyear, Contract Archaeology Within the Highway Context: An Example from South Carolina
2:15 W. James Judge, Archaeological Sampling and Cultural Resources Management
2:30 Veletta Canouts, Management Strategies for Effective Research
2:45 Alan Sullivan, Archaeological Resource Management and Client Information Demands: Efficiency Estimates Involving the SELGEM System
3:00 Michael B. Schiffer and John H. House, The Cache River Archaeological Project: An Experiment in Contract Archaeology
3:15 James T. Rock, The Canyon del Muerto Study
3:30 William Doelle, Maximizing Scarce Resources: A Quantitative Strategy for Interpreting Non-Site Archaeological Manifestations
3:45 John H. House and Michael B. Schiffer, The Cache River Archaeological Project: Substantive Results
4:00 Don P. Morris, The Study of Perishable Materials: Costs and Benefits
4:15 Frank J. Broilo and Charles A. Reher, Research and Mitigation Considerations in the Regional Contract Survey

(10) Symposium: IDEATIONAL DIMENSION IN ARCHAEOLOGY
Civic Room I
Organizers and Chairpersons: Robert L. Hall and Alice B. Kehoe
Participants:
2:00 Alice Kehoe, Introduction
2:15 Jon Muller, Paleopsychology Old and New
2:30 Mary LeCron Foster, Symbolic Sets
2:45 Robert L. Hall, Structure and Continuity in Prehistory
3:00 John G. Douglas, Late Woodland Ceremonialism in the Woodfordian Northeast
3:15 Alan L. Kolata, The Ghost in the Machine
3:30 Peter T. Furst, In Search of Meaning in Precolumbian Art
3:45 Margaret Ann Hardin, Social, Stylistic, and Technological Factors Underlying Ungrammaticality in Ifugao Lime Tubes
4:00 Michael B. Stanislawski, Ask the One Who Made It: Hopi-Tewa Ethnoarchaeology
4:15 Charles A. Bishop, The Ojibwa Collective-Atomistic Argument Re-Examined: Economic Models Applied to Historical and Archaeological Data
4:30 Arthur J. Ray, Jr., The Spatial Structure of the Early Fur Trade of Central and Western Canada: Some Implications for Archaeological Research

(11) Symposium: TECHNIQUES AND METHODOLOGY IN ZOOARCHAEOLOGY
Civic Room III
Organizers and Chairpersons: Frederick Hill and Eileen Johnson
Participants:
2:00 Eileen Johnson, A Review of the Developing Methodology in Zooarchaeology
2:25 Dan Witter, Theoretical Directions for Archaeozoology
2:50 Bonnie L. Whatley, The Study of Animal Bones Within Their Cultural Context
3:15 Stanley J. Olsen, What Bison Is That?
3:40 Richard W. Casteel, Comparison of Column and Whole Unit Samples for Recovering Fish Remains

4:05 Paul Parmalee
4:30 Frederick C. Hill, Ecological and Cultural Interpretations of Archaeological Sites Based on Analysis of Freshwater Mussels

(12, 13) Symposium: FIRST CONFERENCE ON MESOAMERICAN ETHNOHISTORY: CODICES AND MANUSCRIPTS
Civic Room II
Organizer and Chairperson: Nancy P. Troike
Participants:
1:30 Donald D. Brand, Some Persistent Myths in the Ethnohistory of Western Mexico: Mesoamerican Ethnohistory—Codices and Manuscripts
2:00 Doris Heyden, Water and Fire Symbols in Mexican Manuscripts
2:30 Barbro Dahlgren-Jordan, Creation Myths in the Codices
3:00 Jill Mascaro, The Use of "Xipe" as a Personal Name in Mixtec Genealogical Manuscripts
3:30 Emily Rabin, Calendrical Names in the Mixtec Historical Manuscripts
4:00 Nancy P. Troike, The Meanings of Gestures in the Mixtec Codices
4:30 Jacinto Quirarte, Definition of Space in Maya Painting
5:00 Robert M. Carmack, New Quichean Chronicles from Highland Guatemala

7:30 Joaquin Galarza, European Heraldry and Native Manuscripts
8:00 Wigberto Jimenez Moreno, The World Directions and Their Gods in Mesoamerican Codices
8:30 Ellen Taylor Baird, European Elements in Book IX of the Codex Florentino
9:00 Carmen Aguilera, Speech Scrolls in the Florentine Codex
9:30 Elizabeth Hill Boone, Two Painting Styles in the Codex Magliabechiano
10:00 Jacqueline de Durand-Forest, The Affiliation of the Codex Ixtlilxochitl

(14) General Session: METHODOLOGICAL APPROACHES
French Room
Chairperson: Donald A. Graybill
Participants:
1:30 James D. Bellis, Time Controlled Surface Pickup on the Mound House Site in the Lower Illinois River Valley
1:40 Donald A. Graybill, Reality and Comparability in the Use of Cartographic-Hydrologic Variables in Archaeological Research
2:00 Kenneth C. Carstens, Surface Archaeology of Mammoth Cave National Park, Kentucky
2:20 Leon L. Leeds, Landform Analysis at the Rich Woods Site: Controlling the Effects of Land Leveling
2:40 John Weymouth, Three Seasons of Magnetic Surveying on Central Plains Sites
3:00 Louis A. Madden, Defining Subgroups in a Cemetery Population: A Multivariate Analysis of Burial Patterns
3:10 Alfred E. Johnson, Pattern Recognition in a Gravettian Site in Yugoslavia
3:20 Margaret L. Weide, Research Design in Northeastern Prehistory
3:30 Louis James Tartaglia, Subsistence Strategies in Southern California Prehistory
3:40 Crawford H. Blackman, Jr., The Macroscopic Approach to the Identification of Chert Sources
4:00 John B. Van Allsburg and Denise E. King, Shape Analysis: A New Approach to Archaeological Data
4:10 James McW. Kellers, Microscopic Study of Peruvian Textiles
4:20 Henry G. Wylie, Quantification of Projectile Point Typologies: The Mean-Modal Method
4:30 Mark E. Harlan and Jeffrey Neff, Data Management in Archaeology: Considerations of Operationalization

4:30-5:30 RAP SESSION: THE STATUS OF WOMEN AND MINORITIES IN ARCHAEOLOGY
Grand Ballroom
Moderator: Marion White

## THURSDAY EVENING, MAY 8

5:00-6:00 FILMS ON LITHIC TECHNOLOGY
French Room
Producer: Errett Callahan
Lithic Technology, Part I: Percussion Biface Replication
Lithic Technology, Part II: Quarrying

5:00-6:30 OPEN HOUSE
Rose Room

6:00-7:00 RECEPTION FOR CONTRIBUTORS TO "LITHICOLOGY AND PREHISTORIC ANTHROPOLOGY"
Florentine Room
Chairperson: Ruthann Knudson



(15) REGISTRATION OF PROFESSIONAL ARCHAEOLOGISTS
Grand Ballroom
8:30-10:30 Chairperson: Raymond H. Thompson
Participants: Edward B. Jelks, James Judge, Charles R. McGimsey, Stuart Struever, Fred Wendorf

## FRIDAY MORNING, MAY 9

(16) Symposium: PREHISTORIC ADAPTATIONS IN THE CHIHUAHUAN DESERT—PART I
French Room
Organizer: Harry J. Shafer
Chairperson: James M. Adovasio
Participants:
8:50 Introduction
9:00 Gary F. Fry, Human Coprolites from Frightful Cave
9:20 Vaughn M. Bryant, Jr., Pollen Analysis of Prehistoric Human Coprolites from Frightful Cave, Coahuila, Mexico
9:40 James M. Adovasio, The Evolution of Basketry Manufacture in Northern Mexico and Trans-Pecos Texas
10:00 Discussion
10:40 Jeremiah F. Epstein, Adaptation as Viewed from Northeastern Mexico
11:00 Lorraine H. Greene, Indian Populations in Southwestern Coahuila, Mexico, During Historic Times
11:20 Richard S. MacNeish, Archaeological Sequence in Caves in Southwestern Tamaulipas
11:40 Discussion

(17) Symposium: ARCHAEOLOGY AND ENVIRONMENT AT DIRTY SHAME ROCKSHELTER, SOUTHEAST OREGON
Civic Room I
Organizer and Chairperson: C. Melvin Aikens
Participants:
9:00 David L. Cole, Dirth Shame Rockshelter, Malheur County, Oregon: Excavation and Cultural Features
9:20 Laurence R. Kittleman, Geology of Dirty Shame Rockshelter
9:40 Donald K. Grayson, Paleoenvironmental Implications of the Vertebrae Fauna from the Dirty Shame Rockshelter
10:00 H. J. Hall, Paleoscatology at Dirty Shame Rockshelter
10:20 J. M. Adovasio, R. Andrews, and R. Carlisle, Perishable Industries from Dirty Shame Rockshelter
10:40 Richard C. Hanes, Lithic Typology and Distributions
11:00 Rick Minor, C. Melvin Aikens, and Robert Stuckenrath, Cultural Phases and C-14 Chronology of Dirty Shame Rockshelter

(18) Symposium: ARCHAEOECONOMICS—PART I: GOALS, THEORIES, AND MODELS
Civic Room III
Organizer and Chairperson: J. E. Ericson
Participants:
8:30 Jonathon E. Ericson, Modeling Egalitarian Exchange Systems
8:50 Cynthia Irwin-Williams, Explaining the Movement of Material Culture Objects in Prehistory
9:10 George Dalton, Aboriginal Economies in Stateless Societies: Interaction Spheres
9:30 Timothy K. Earle, Redistribution: What Goes Up Stays There
→ 9:50 Jane Pires-Ferreira, Early to Middle Formative Mesoamerica: The Reorganization of Prehistoric Exchange Networks
→ 10:10 Colin Renfrew, Models of Trade and Spatial Distribution: Some Questions
→ 10:30 Arthur A. Saxe, Adaptive Radiation of State Society: A Predatory Model
10:50 P. L. Gall, Economic and Mortuary Practices
11:10 Fred T. Plog, III, Models of Economic Exchange
11:30 Norman Hammond, The Maya Jade Trade: Source Locations and Analyses and Artifact Attributions

(19) Symposium: DYNAMICS OF CULTURAL RESOURCE MANAGEMENT
Regency Room
Organizers and Chairpersons: Ray T. Matheny and Dale L. Berge
Participants:
8:30 Ray T. Matheny and Dale L. Berge, Problems Pertaining to Cultural Resource Management
8:50 Roy W. Reaves III, Cultural Resource Laws and Policies: Background and History
9:10 Charles M. McKinney, Cultural Resource Planning in Federal Projects and Land Management Activities
9:30 Jack R. Rudy, Discussion of Cultural Resources for Purposes of the National Environmental Policy Act and the National Historic Preservation Act

9:50 Lawrence E. Aten, Coordination of Federal Data Recovery Activities
10:10 Roy Verner, Problems in Resource Management
10:30 Ken M. Neuschwander, Voice from Private Industry
10:50 Hester A. Davis, The Public and Cultural Resource Legislation: Reaction and Responsibility
Discussants: William D. Lipe, Raymond H. Thompson, Dale L. Berge, Evan I. DeBloois, Thomas King

(20) General Session: AMERICAN SOUTHWEST
Grand Ballroom
Chairperson: Robert D. Cunningham
Participants:
9:00 Annetta Cheek, Historic Records and the Study of Acculturation: A Case Study
9:10 Rex E. Gerald, Drought-Correlated Changes in Two Prehistoric Pueblo Communities in Southeastern Arizona
9:30 Stephen A. LeBlanc, Excavations on the Mimbres River, New Mexico
9:40 J. Ned Woodall, A Possible Ceremonial Precinct in Valencia County, New Mexico
9:50 Charles H. Miksicek, A Preliminary Analysis of Carbonized Maize from the El Morro Valley
10:00 Patty Jo Watson, Aspects of Zuni Prehistory: The Cibola Archaeological Research Project
10:20 J. James Trott and Claudia Chang, A Study of Seasonality in the Rough Rock Area, Arizona
10:30 Barrie M. Thornton, Utility Ceramics Analysis: Approaching Behavior and Organization
10:40 Jerome I. Schaefer, Pottery Recycling and Use-Life Extension at Antelope House: A Behavioral Chain Analysis
10:50 E. Pierre Morenon, Chacoan Roads and Adaptation: How a Prehistoric Population Can Define and Control Its Social and Natural Environment
11:00 David A. Breternitz, The Mesa Verde: Culture and/or Area?
11:10 Jonathan E. Reyman, A New Map of Sun Temple, Mesa Verde National Park
11:30 Dan Brooks, Prehistoric Soil and Water Control in the American Southwest: A Case Study
11:40 John A. Ware and Robert C. Euler, An Early Basketmaker II Complex on Black Mesa, Northeastern Arizona

(21) Symposium: ADVANCES IN ARCHAEOMETRY AND ARCHAEOCHROMETRICS
Civic Room II
Organizer and Chairperson: R. E. Taylor
Participants:
9:00 May Saltzman, Identification of Natural Dyes of Precolumbian Peruvian Textiles
9:20 Irving Friedman, Obsidian Hydration Dating: Experimental Rates
9:40 R. E. Taylor, Dating Chipped Lithic Materials by Flourine Diffusion Profiles
10:00 Bryant Bannister and William J. Robinson, Advances in Tree-Ring Dating in Archaeology
10:20 Jeffrey L. Bada and Pat Helfman, Further Evidence of the Antiquity of Man in North America Deduced Using Aspartic Acid Racemization Reaction
10:40 Jonathon E. Ericson and Rainer Berger, New Results in Obsidian Hydration Dating Research
11:00 Edgar P. Hare, Amino Acid Dating of Bones, Shells, and Teeth
11:20 Rainer Berger, Advances in Radiocarbon Dating

## FRIDAY AFTERNOON, MAY 9

Noon-2:00 TABLE TALK
North Rose Room
Informal luncheon with table hosts Cynthia Irwin-Williams, R. Bruce McMillan, Charles Redman, and Stuart Struever. Attendance by subscription only. Inquire at ADVANCE REGISTRATION DESK IN LOBBY AREA.

(22) Symposium: PREHISTORIC ADAPTATIONS IN THE CHIHUAHUAN DESERT—PART II
French Room
Organizer and Chairperson: Harry J. Shafer
Participants:
2:00 Charles C. Di Peso, Prehistoric Casas Grandes Hydraulic Controls of the Casas Grandes Valley
2:20 Thomas R. Hester, Late Prehistoric Cultural Patterns Along the Lower Rio Grande, Texas
2:40 David S. Dibble, The Infierno Phase: Evidence for a Late Prehistoric Occupation in the Northeastern Chihuahuan Desert Margins
3:00 Discussion



3:30 Glenna Williams-Dean, Technological Study of Archaic Sandals from the Lower Pecos Region of Texas
3:50 Harry J. Shafer, Art and Territoriality in the Lower Pecos Archaic
4:10 Gary L. Moore, Scheduled Hunting and Gathering in the Trans-Pecos
4:30 Discussion and Concluding Statement

(23) Symposium: INFORMATION THEORY: MODELS AND MEASUREMENT OF ARCHAEOLOGICAL SYSTEMS
Regency Room
Organizers: Frederick J. Gorman, Nan A. Rothschild, and Joseph A. Tainter
Chairperson: James A. Brown
Participants:
2:00 Nan A. Rothschild and Thomas J. Riley, Information About Information Theory in Archaeology
2:20 John S. Justeson, A Preliminary to Process in Information-Theoretic Approaches
2:40 Henry Wright, Information, Control, and Political Hierarchy
3:00 Frederick J. Gorman, The Role of Information Theory in Expanding Archaeological Inquiry
3:20 Joseph A. Tainter, The Measurement of Organization in Prehistoric Social Systems
Discussants: James A. Brown, Christopher S. Peebles

(24, 25) Symposium: APPROACHES TO FAUNAL ANALYSIS IN THE MIDDLE EAST—PART I
Civic Room III
Organizers: Richard Meadow and Melinda Zeder
Chairperson: Melinda Zeder
2:00 Øystein LaBianca, Logistical Aspects of Faunal Analysis in Palestine
2:20 Princilla Turnbull, Field Techniques for Salvaging Bone on Prehistoric Sites in the Middle East
2:40 Richard H. Meadow, Faunal Samples and Excavation in the Middle East
3:00 Hans-Peter Uerpmann, The Use of Old Collections in Modern Faunal Analysis
3:20 John McArdle, Richard Redding, and Melinda Zeder, Applications of Numerical Coding and Computer Analysis to Problems of Zooarchaeology
3:40 Barbara Lawrence, Analysis of Unidentifiable Bone from Cayonu: An Early Village Farming Community
4:00 Melinda Zeder, The Use of Osteologic Micro-Structure and Chemical Composition in the Determination of Wild and Domestic Caprines
4:20 Howard M. Hecker, Domestication Reconsidered: Its Implications for Faunal Analysis
4:40 Discussants: Charles Reed, Joachim Boessneck

Symposium: APPROACHES TO FAUNAL ANALYSIS IN THE MIDDLE EAST—PART II
Civic Room III
Chairperson: Richard Meadow
8:00 Pierre Ducos, The Use of Statistical Methods in the Analysis of Faunal Material from the Middle East
8:20 Sebastian Payne, Kill-Off Patterns and Man-Animal Relationships in Sheep and Goats: Collection and Interpretation of Data
8:40 Hind Sadek-Kooros, Aging of Mountain Sheep: Criteria of Tooth-Wear as Compared with Tooth Wear on Iron Age Sheep
9:00 Julliet Clutton-Brock, A Zoologist's Approach to Prehistory in the Middle East
9:20 Richard W. Redding, Ecology of Tatera indica (Indian gerbil) and Meriones crassus (Sundevall's jird) on the Susiana Plain, Southwestern Iran, with Application to the Monitoring of Past Environments
9:40 Bruno Compagoni, The Wild Fauna at Shar-i Sokhta: Evidence for Natural Environment in an Urban Site
10:00 Sandor Bokonyi, Cultural and Environmental Differences in Faunal Samples from Five Early Neolithic Sites in Southwest Asia
10:20 Discussants: Charles Reed, Joachim Boessneck

(26) Symposium: WILDERNESS AND CULTURAL VALUES
Civic Room II
Organizer and Chairperson: Dee F. Green
Participants:
1:30 Dee F. Green, Wilderness and Cultural Values: Introduction
1:50 John Young, Cultural Resource Preservation: Federal Responsibilities in Wilderness Areas
2:10 William D. Lipe, Archaeological Conservation and the Wilderness
2:30 William A. Worf, Cultural Values in the Wilderness: The Wilderness Perspective
2:50 James E. Ayres, Cultural Values in the Wilderness: The Cultural Perspective
3:10 Steven Hackenberger, A Wildlife Conservation Model for Archaeological Conservation
3:30 Discussants: Gordon Sanford, Steven LeBlanc

(27) General Session: THEORY/PALEOECOLOGY
Grand Ballroom
Chairperson: John E. Keller
Participants:

1:30 Robert K. Hitchcock, Bryan A. Marozas, and James I. Ebert, Analogy and the Archaeology of Hunters and Gatherers
1:40 James I. Ebert and Robert K. Hitchcock, Claude Levi-Strauss and the Archaeology of Prehistoric Structures
1:50 Vernon G. Baker, Vinyl-Topped Automobiles and Archaeology: Research Directions for the Amateur and Academian
2:10 A. E. Rogge, Processual Archaeology and the Philosophy of Science: Three Problems
2:20 Jack Betram, The Laws of Mammalian Species Diversity: Implications for Paleoecology, Subsistence Theory, Comparative Anthropology, and the Overkill Hypothesis
2:40 Paul R. Fish, Replication Studies: The Implications for the Statistical Analysis of Artifacts
2:50 William E. Reynolds and Marvin D. Jeter, An Evaluation of Surface Sampling Intensities and Designs
3:00 Gordon Bronitsky, Trade in the United States Southwest: A Consideration of Models
3:20 Richard L. Zurel, Seasonality of Unmanaged Food Resources in the Great Lakes Region: A Look at the Cultural and Ecological Niche of Marginal Agriculture
3:40 Lathel F. Duffield, Modern Bison in the Eastern United States
3:50 Kurt House, Toward Progress in Faunal Analysis: Applications in Texas
4:00 John E. Keller, Paleoecological Conditions and Subsistence Potential at the George C. Davis Site
4:20 Frederick Matthew Wiseman and Edward S. Deevey, The Earliest Maya
4:40 B. Miles Gilbert, Zooarchaeology of the Toltecs at Tula, Hidalgo

(28) General Session: CIRCUM-PACIFIC ARCHAEOLOGY
Civic Room I
Chairperson: Alan H. Simmons
Participants:

1:15 Janet L. Friedman, Aboriginal Wood Use on the Northwest Coast: Evidence from the Ozette Site, Washington
1:25 Alan H. Simmons, Buy the Spirit But Don't Take the Bone: A Case Study of Archaeological Ethics
1:45 Robert E. Ackerman, Contract Archaeology and Archaeological Research: The North Tongass National Forest, Southeast Alaska
1:55 Donald E. Dumond, Recent Research in the Naknek Region, Southwestern Alaska
2:05 Winfield Henn, Current Research in the Ugashik River Drainage, Alaska Peninsula
2:15 Douglas W. Veltre, Archaeological Survey of Atka Island, Aleutian Islands, Alaska: 1974
2:25 Jason W. Smith, The Northeast Asian-Northwest American Microblade Tradition (Nanamt): A Synopsis
2:45 Janet O. Frost, Prehistory in American Samoa
2:55 Richard B. Stamps, Was There Slash and Burn Agriculture in Central Taiwan at 9000 B.C.?
3:05 Paul Rosendahl, Contract Archaeology in Hawaii

(29) General Session: MORTUARY PRACTICES
Civic Room I
Chairperson: Elton R. Prewitt
Participants:

3:30 Lynne Goldstein, Spatial Organization in Mortuary Analysis: Mississippian Cemetery Examples
3:40 Elton R. Prewitt, Post-Archaic Mortuary Practices at the Loeve-Fox Site
3:50 Gloria Edynak, Determining Life-Styles from Human Skeletal Materials: A Medieval Yugoslav Example

## FRIDAY EVENING, MAY 9

5:30-7:30 SOCIETY FOR AMERICAN ARCHAEOLOGY ANNUAL BUSINESS MEETING
Grand Ballroom
Charles R. McGimsey, III, President

7:30-8:30 RECEPTION FOR NEW MEMBERS
Florentine Room
Present and past officers of the Society greet new members and members attending their first annual meeting.

OPEN HOUSE: Institute for the Study of Earth and Man, Southern Methodist University



(30) SESSION: FUTURE EMPLOYMENT IN ARCHAEOLOGY
Grand Ballroom
Chairpersons: T. Patrick Culbert and William D. Lipe

8:30-10:30 Participants: Charles R. McGimsey (President SAA), Richard E. W. Adams (Secretary SAA), Ann Early, Donald Miller, Douglas H. Scovill, W. Raymond Wood

(31) Symposium: EXPANSION OF THE INCA STATE: A PERSPECTIVE FROM ARCHAEOLOGY AND ETHNOHISTORY
Civic Room II
Organizers and Chairpersons: Tom D. Dillehay and Craig Morris
Participants:

7:30 Bernardo Berdichewsky, The Inca Conquest of the Picunche of Central Chile, and the Corresponding Modifications of their Mode of Production
7:50 Geoffrey W. Conrad, Chiquitoy Viejo: An Inca Administrative Center in the Chicama Valley, Peru
8:10 Tom D. Dillehay, Upstairs Looking Down: A Geographic Perspective of Inca Activity in the Chillon Valley, Peru
8:30 Craig Morris, Infrastructure of the Inca Expansion in the Central Highlands
8:50 John V. Murra, The Conquest and Annexation of Qollasuyu by the Inka State
9:10 Patricia Netherly, The Management of Late Andean Irrigation Systems
9:30 Pat H. Stein, The Inca's Hospitality: Food Processing and Distribution at Huanuco Viejo

## SATURDAY MORNING, MAY 10

(32) COPA: THE BRITISH APPROACH: RESCUE
Florentine Room
Organizer and Chairperson: Hester A. Davis
Participants:

9:00-12:00 Henry F. Cleere, Director, Council of British Archaeology
P. J. Fowler, Honorary Secretary, Council of British Archaeology
A. D. Saunders, Chief Inspector of Ancient Monuments and Historic Buildings
T. G. Hassall, Director, Oxfordshire Archaeological Unit
Topics: RESCUE archaeology, standards, County Archaeological Units, training, professional, public service archaeology

(33, 34) Symposium: EARLY MAN IN THE NEW WORLD: A VIEW AS WE APPROACH THE SEMI-CENTENNIAL OF THE FIRST PALEO-INDIAN DISCOVERY AT FOLSOM, NEW MEXICO
Regency Room
Organizer and Chairperson: George A. Agogino
Participants:

9:00 Richard Shutler, Jr., and Duane C. Anderson, The Cherokee Sewer Site—A Bison Kill Site in Northwestern Iowa
9:25 Jack T. Hughes, The Rex Rodgers Bison Kill
9:50 Wesley R. Hurt, The Edge-Trimmed Tool Tradition
10:15 Thomas F. Kehoe, The Paleo-Indian Bison Drive: Feasibility Studies
10:40 Joe Ben Wheat, Artifact Life History Research—or Typology Revisited
11:05 Charles Johnson, Recent Development at the Lubbock Lake Site, West Texas

1:30 George Frison, The Colby Site: A Mammoth Procurement Site in Northern Wyoming
1:55 Donald W. Dragoo, Early Lithic Cultures of Eastern North America
2:20 C. Vance Haynes, L. D. Agenbroad, and Emil W. Haury, New Data From the Lehner Clovis Site
2:45 Charles Hoffman, Jr., and Sandra L. Rayl, A Paleo-Indian Kill Site in North Florida
3:10 Frank C. Hibben, Paleo-Indians in the Albuquerque Area
3:35 R. Stuckenrath, J. M. Adovasio, J. D. Gunn, and J. Donahue, Excavations at Meadowcraft Rockshelter (36WH297), 1973-1974: A Progress Report
4:00 C. Melvin Aikens, Early Occupation West of the Rockies: An Overview
4:25 Robert L. Stephenson, A Haunting Shadow in the Southeast

(35) Symposium: QUANTITATIVE ANALYSIS OF INTRASITE SPATIAL DISTRIBUTIONS—PART I
French Room
Organizers: G. A. Clark and Glen T. Hanson
Chairperson: Robert Whallon
Participants:

9:00 Richard Ciolek-Torrello and Susan Ciolek-Torello, Reconstruction of Activities by Formal and Spatial Analysis
9:30 Glen D. DeGarmo, Distribution of Activities at Coyote Creek, Site 01
10:00 Robert E. Gasser and Frank E. Bayham, The Flores Site: A Spatial/Functional Analysis

10:30 Break
10:45 Harold Hietala and C. Reid Ferring, Pattern Recognition Analyses at an Israeli Upper Paleolithic Site
11:15 Leslie Lavine-Lischka, An Approach to Lithic Analysis for Deriving Cultural Inferences
11:45 Discussion

(36) Symposium: RECENT ARCHAEOLOGICAL WORK IN AFRICA AND THE NEAR EAST
Civic Room II
Organizers: Fred Wendorf and Anthony E. Marks
Chairperson: Fred Wendorf
Participants:
8:30 J. W. K. Harris, The Karari Industry: A Preliminary Report of a new Lower Pleistocene Industry, from Recent Investigations Carried Out at East Lake Rudolf, Kenya (1972-74)
9:00 J. Desmond Clark, Recent Archaeological Studies in Eastern Ethiopia
9:30 Fred Wendorf, An Aterian Kill Site in the Egyptian Sahara
10:00 Anthony E. Marks, Upper Paleolithic Sites and Chronology in the Central Negev, Israel
10:30 H. B. Schroeder, Early Holocene Occupation in the Anti-Lebanon Mountains
11:00 Charles L. Redman, Culture Change and the Introduction of Agriculture
11:30 Frank Hole, Perspectives on Pastoralism in Prehistory

(37) Symposium: REGIONAL SURVEYS IN THE SOUTHWEST: RESULTS AND PROBLEMS
Grand Ballroom
Organizers: W. D. Lipe and R. G. Matson
Chairperson: Dee Green
Participants:
8:30 Jeffrey S. Dean, Alexander J. Lindsay, Jr., and William J. Robinson, The Long House Valley Project
8:50 Robert C. Euler, The Black Mesa Archaeological Project
9:10 W. D. Lipe, R. G. Matson, and Paul Sneed, The Cedar Mesa Project
9:30 Evan I. DeBloois, A Summary of the First Four Years of the Elk Ridge Archaeological Project, Southeastern Utah
9:50 Jack E. Smith and David A. Breternitz, Archaeological Sites on Public Lands, Southwestern Colorado
10:10 Charles A. Reher, Settlement and Subsistence Along the Lower Chaco River: Operationalizing Research Hypotheses for the Regional Survey
10:30 Patty Jo Watson, Charles L. Redman, and Stephen A. LeBlanc, The Cibola Archaeological Research Project: An Integrated Survey and Excavation Strategy for Intra-Regional Interaction Information
10:50 Fred T. Plog III, The Chevelon Archaeological Research Project
11:10 George J. Gumerman, The Central Arizona Ecotone Project
Discussants: Cynthia Irwin-Williams, W. James Judge, Michael B. Schiffer

(38) Symposium: UNDERWATER ARCHAEOLOGY
Civic Room III
Organizer: J. Barto Arnold III
Chairpersons: J. Barto Arnold III and Carl J. Clausen
Participants:
9:00 Stephen J. Gluckman, Underwater Archaeology Since Goggin
9:20 Carl J. Clausen and H. K. Brooks, The Climatic and Environmental Implications of the Florida Warm Mineral Springs Early Man Site
9:40 J. Barto Arnold III, New Marine Magnetometer Survey Technology for Underwater Archaeological Applications
10:00 Reynold J. Ruppe, Archaeological Site Survey on the Continental Shelf
10:20 Calvin R. Cummings, Summary of National Park Service Underwater Archaeological Activities
10:40 W. A. Cockrell, Implications of Submerged Archaeological Sites on Florida's Continental Shelf
11:00 Gordon P. Watts, Jr., Oceanographic Tools and Techniques in Underwater Archaeology: The Search for the Monitor
11:20 George R. Fischer, Legal Aspects of Underwater Archaeology
11:40 Joel L. Shiner, Early Man and the Continental Shelf

(39) General Session: SOUTH AMERICAN AND CARIBBEAN
Civic Room I
Chairperson: James S. Kus
Participants:
8:30 W. H. Sears, A Synthesis of Bahamas Prehistory Based on Recent Surveys and Excavations
8:40 Duncan Pring, The Corazal Project: Excavations in Northern Belize, 1975
8:50 Raymond Sidrys, A Second Round Structure from Northern Belize
9:00 Frederick W. Lange, Preliminary Research in the Nosara Valley, Costa Rica



9:10 Richard W. Magnus, Present Archaeological Research in Chontales, Nicaragua: Its Implications for the Prehistory of Lower Central America
9:20 K. O. Bruhns, Zapatera Island, Nicaragua: New Data on Ancient Settlements
9:30 Erika Wagner, Re-evaluation of the Western Venezuelan Dabajuroid Tradition
9:40 David L. Browman, Contributions of Chiripa in the Development of the Tiwanaku Empire
10:00 Kathy Schreiber, Jincamoqo: Another "Great Enclosure" from Middle Horizon Peru
10:10 Joseph G. Lischka, Periodic Catastrophism on the Peruvian Coast
10:30 Patricia Knobloch, Research Project: Huarpa Ceramic Analysis
10:40 Mark Druss, Chiuchiu Complex: Phase Sequence

(40) General Session: PLAINS ARCHAEOLOGY
Civic Room I
Chairperson: Robert D. Hyatt
Participants:
11:00 Rain Vehik, Preliminary Results of Archaeological Investigations in South-Central North Dakota
11:10 Susan Vehik, An Assessment of the Ancestral Relations of the Great Bend Aspect
11:30 Frank W. Eddy and Ric Windmiller, Two Forks: An Archaeological Study of Settlements and Land Use in the Colorado Foothills
11:50 Kelley C. Duncan, Lithic Assemblages and Prehistoric Resources in Central Oklahoma
12:00 Robert F. Maslowski, The Chronological Position of the Frank M. Setzler Collection in Trans-Pecos Prehistory

## SATURDAY AFTERNOON, MAY 10

(41) Symposium: QUANTITATIVE ANALYSIS OF INTRASITE SPATIAL DISTRIBUTION—PART II
French Room
Organizers: G. A. Clark and Glen T. Hanson
Chairperson: Robert Whallon
Participants:
1:30 T. Douglas Price, Inter-Site Comparison Using Measures of Spatial Patterning
2:00 Glen T. Hanson, Shared-Tools or Shared Area: An Alternative Approach to the Analysis of Spatial Associations
2:30 G. A. Clark, Spatial Association at Liencres: An Early Holocene Open Site on the Santander Coast, North Central Spain
3:00 Break
3:15 William E. Reynolds, Boundary Definition in Nearest Neighbor Analysis: An Analysis of the Connie Site
3:45 Martin R. Rose, A Spatial Approach to Point Pattern Distribution Correlations
4:15 Robert K. Vierra, Spatial Analysis and Data Reduction Strategies
4:45 Discussion

(42) Symposium: NEW WORLD LITHIC ANALYSIS: REGIONAL EVALUATIONS
Grand Ballroom
Organizers and Chairpersons: Alice N. Benfer and Ruthann Knudson
Participants:
1:00 John L. Fagan, The Plateau and Northwest Coast
1:20 James P. Green, The Great Basin and California
1:40 Richard Chapman, The Southwest
2:00 Ruthann Knudson, The North American Plains
2:20 Dena F. Dincauze, Lithic Analysis in the Northeast
2:40 Break
3:00 Jason M. Fenwick and Michael B. Collins, Southeastern United States and Texas
3:20 Alice Benfer, Northern Mesoamerica
3:40 Payson D. Sheets, Southern Mesoamerica
3:00 L. Lewis Johnson, South America
Discussants: Ralph M. Rowlett, Arthur Jelinek, Charles M. Nelson

(43) General Session: MESOAMERICAN ARCHAEOLOGY
Civic Room II
Chairperson: Charles R. Wicke
Participants:
1:30 Charles Dickson Trombold, Prehistoric Road Systems on the Northern Mesoamerican Frontier: An Application of Locational and Network Analysis to the Area Around La Quemada, Zacatecas, Mexico
1:40 Jay K. Johnson, Micropatterns in the Settlement of the Intermediate Plains, Chiapas, Mexico
1:50 Charles D. Cheek, Jade, Stone Monuments, and the Olmec
2:00 James G. Baker, The Introductory Glyph—Olmec and Maya
2:10 Anatole Pohorilenko, The Use of Iconography and the Question of Olmec Deities
2:20 Irwin Rovner, The Cyclical Rise and Fall of Maya Lithic Trade Spheres

2:40 Wilma E. Wetterstrom, A Nutritional Analysis of the Tehuacan Food Remains
2:50 Patricia Anawalt, Differential Use of Aztec Military Garments: A Textual Analysis
3:10 Dudley M. Varner, Settlement Processes in the Etla Arm, Valley of Oaxaca, Mexico
3:20 Stephan A. Kowalewski, Economic Reformation and the Collapse of Monte Alban
3:30 John W. Fox, Protohistoric Highland Maya Acropolis Sites
3:40 James M. Hewitt, A Reappraisal of the Development of Village Farming in Early Formative Mesoamerica
3:50 Nicholas M. Hellmuth, Precolumbian Ball Game of the Guatemala Maya
4:10 Kenneth L. Brown, The Valley of Guatemala: A Highland Port-of-Trade
4:30 Robert E. Greengo, Prehistoric Architecture in Northeastern Guerrero
4:40 Peter D. Harrison, Intensive Agriculture in Southern Quintana Roo, Mexico: Some New Lines of Evidence and Implications for Maya Prehistory
4:50 John M. Andreson and Raymond Sidrys, Obsidian Sources in the Maya Area

(44) General Session: SCIENCE IN ARCHAEOLOGY
Civic Room III
Chairperson: Dee Ann Story
Participants:
1:30 John A. Hanson, George J. Gumerman, and Carol S. Weed, Archaeology at a Distance: Applications of NASA's Skylab Imagery
1:50 James W. Stoutamire, Trend Surface Analysis as Applied to Surface Survey Data from Tula, Mexico
2:00 D. W. Von Endt, E. P. Hare, D. J. Ortner, and A. I. Stix, Amino Acid Isomerization Rates and Their Use in Dating Archaeological Bone
2:10 Ronald L. Wallace, An Archaeological, Ethnohistoric, and Biochemical Investigation of the Central Georgia Coast, A.D. 1500-1650
2:20 Helene R. Dunbar, Chemical and Metallographic Analysis of Selected Copper Artifacts from the Engelbert Site
2:30 Dee Ann Story and S. Valastro, Jr., Radiocarbon Dating and the George C. Davis Site
2:40 S. Valastro, Jr., and Robert L. Folk, C-14 Mortar Dating at Stobi, Yugoslavia: A New Technique
2:50 David J. Ives, Heat Treatment Experiments: Fact or Fiction?
3:00 Juan Carlos Nemaric, The Role of Taxonomy in Archaeology
3:20 Paul Ossa, A Typological Analysis of Chamfered Pieces
3:30 Robin Torrence, The Source for Aegean Obsidian Trade: Sta Nychia Quarry and Workshop
3:40 Frank, J. Findlow, Jonathon E. Ericson, and Suzanne P. De Atley, A New Obsidian Hydration Rate for Certain Obsidians in the American Southwest
4:00 Judith A. Rasson, Trace Element Analysis of Obsidian from Neolithic Yugoslavia
4:10 Chris Squire and Michael W. Spence, Micro-Analysis of Obsidian End Scrapers from Jalisco, Mexico
4:30 Robert L. DuBois, Recent Developments in the Archaeomagnetic Dating Program

(45) General Session: EASTERN UNITED STATES
Civic Room I
Chairperson: Tom Ryan
Participants:
1:30 Jefferson Chapman, Bifurcate Base Projectile Points: A Culture Horizon Marker in Eastern North America?
1:40 Brent W. Smith, Prehistoric Settlement Patterns of the Young's Bayou Drainage: Natchitoches Parish, Louisiana
2:00 C. Roger Nance, Excavations at Durant Bend: Middle Woodland to Protohistoric Archaeology in Central Alabama
2:10 Patricia J. O'Brien, Cahokia Tract 15B—The Social Functions of Nine Architectural Phases
2:30 Ann I. Otteson, Prehistoric Exchange Systems in the Eastern United States
2:40 J. M. Heilman, Ceramics and Spatial Patterning at the Incinerator Site—(33MY57)
2:50 C. Orrin Shane III and Michael Barber, Analysis of the Vertebrate Fauna From the Incinerator Site and Its Implications for Fort Ancient Settlement Patterning
3:00 Louise M. Robbins, The Investigation of Infanticide in an Ohio Fort Ancient Site: A Demonstration of Archaeologist/Physical Anthropologist Field Synergy
3:20 N'omi Greber, Indications of Social Organization Derived from Ohio Hopewell Mounds
3:30 Frank Schambach, The Anatomy of a Fourteenth Century Caddoan Ceremonial Center in Southwest Arkansas
3:40 David J. Hally and Wyman W. Trotti, The Settlement Plan of the King Site, An Early Historic Indian Town in Northwest Georgia
4:00 Gary W. Hennen, A Paleo-Ecological Locational Analysis of the Lower Scioto Region of Ohio Part I: Demographic Analysis



## ABSTRACTS OF ORGANIZED SYMPOSIA

(2) ADAPTATION TO COASTAL RESOURCES. The resources of marine environments have been used by man from early prehistoric times to the present day. While the coast is recognized as a hospitable environment, the dynamics of the adaptation to the coast and the sea have been only minimally investigated by archaeologists. Our present understanding of adjustment to coastal resources is the result of integrated archaeological and biological efforts. This symposium seeks to examine space and time perspectives of man's use of flora and fauna in the coastal ecotone.

(3) RECENT EMPHASES IN LITHIC ANALYSIS. Recent emphases in lithic analysis include diverse and highly technical methods and approaches, all of which could not be summarized in one symposium. The participants do, however, represent a variety of innovative approaches. Each paper describes a method for the analysis of lithic artifacts or materials, and each focuses on the usefulness of that approach in either establishing chronology, distinguishing peoples, describing processes of change, reconstructing prehistoric manufacturing, utilization or exchange systems, or recognizing individual knappers.

(4) CONFIRMATION IN ARCHAEOLOGY. Confidence in the validity or falseness of propositions is one meaning of knowledge. Knowledge is gained through the testing of propositions. This symposium explores methods and techniques of archaeological confirmation and the philosophical bases on which testing rests.

(5) MODELS AND GREAT BASIN PREHISTORY. This symposium reviews and evaluates the interrelationships between archaeology and models and methods of disciplines contributory to archaeology in the Great Basin. The central question for discussion is, What are the problems of "fit" and congruence between archaeological models and methods and linguistic, paleoecological, ethnographic, and physical anthropological/demographic models and methods? Are specialists in the several fields talking to or past each other?

(8) RECENT RESEARCH ON THE EUROPEAN PALEOLITHIC. Members of the symposium, most of whom are archaeologists based at North American universities, will report on recent field research undertaken by them and others. The research concerns various aspects of the Paleolithic (Lower, Middle, and Upper) as determined from sites primarily but not exclusively in western Europe. The communications will emphasize the kind of research undertaken and the results obtained to date. Where relevant, the relationship of the "foreign" research to that being undertaken by national archaeologists in the countries concerned will be considered.

(9) ARCHAEOLOGICAL RESEARCH AND CULTURAL RESOURCE MANAGEMENT. The symposium examines a variety of approaches for gaining the maximum benefit from contract research for both the scientific community and cultural resources management. Emphasis is placed upon training competent researchers, employing viable research strategies, maximizing returns on the studied materials, and gives concrete examples of studies that have considered both management requirements and scientific research interests.

(10) IDEATIONAL DIMENSION IN ARCHAEOLOGY. Archaeology has tended to be dominated by interpretations formed in a materialist framework. Those aspects of past societies that are most closely and directly related to cognitive schemata have consequently tended to be slighted. This symposium explores what may be termed the ideational dimensions of human behavior in reference to archaeology, including cognitive archaeology, structuralism, symbolic systems, and ethnographic models. The ideational dimension, added to the more standard methodologies, brings archaeology closer to the core of anthropological theory.

(11) TECHNIQUES AND METHODOLOGY IN ZOOARCHAEOLOGY. The field of zooarchaeology is rapidly developing within the discipline of archaeology. As such, there is a definite need for more of an agreement on the use of techniques and methodologies which have been used in zooarchaeology along with recognition of the limitations of each. Studies of both vertebrates and invertebrates within an archaeological context can contribute significantly to the understanding of a prehistoric culture. The symposium will deal in general with the types of research and possible interpretations in zooarchaeological work.

(12, 13) FIRST CONFERENCE ON MESOAMERICAN ETHNOHISTORY: CODICES AND MANUSCRIPTS. This symposium is regionally, topically, and temporally focused upon the documentary sources for the high culture area of native Mexico and Guatemala prior to the Spanish Conquest. Within this complex region the geographical coverage of the symposium is broad, and includes central Mexico, Oaxaca, western Mexico, and the Maya and

Guatemala zone. The participants have been chosen to insure coverage of important topics and to reflect different points of view. Their papers will illustrate the range and variety of information that may be obtained from both pre-Conquest and post-Hispanic documentary materials, as well as show how these sources may be integrated with one another and with other data to reveal new aspects of ancient Mesoamerican culture.

(16, 22) PREHISTORIC ADAPTATIONS IN THE CHIHUAHUAN DESERT. The Chihuahuan Desert covers a large area of south-central North America and evidences a long post-glacial occupation by peoples having largely extractive technologies. Archaeological and, when available, ethnobotanical data from Frightful Cave in Coahuila, sites in Tamaulipas, Nuevo Leon, Chihuahua, southern and southwest Texas are synthesized. Basic problems which can be used to frame future research are outlined and together, emphasize the archaeological resource potential of the Chihuahuan Desert for the study of hunter-gatherer and horticultural adaptations to arid and semi-arid lands.

(17) ARCHAEOLOGY AND ENVIRONMENT AT DIRTY SHAME ROCKSHELTER, SOUTHEAST OREGON. Dirty Shame Rockshelter, in the Owyhee Uplands on the northeastern edge of the Grant Basin, was occupied from before 9500 B.P. down to historic times. The symposium reports the results of environmental and cultural studies based on data from the shelter, and tentatively defines a sequence of cultural/environmental change and stability spanning Holocene time in the region.

(18) ARCHAEOECONOMICS—PART I: GOALS, THEORIES, AND MODELS. Archaeologists are increasingly involved in economic anthropological research where they benefit from a data set reflecting long term, repeated socio-economic interactions, both on a regional and local scale. In recent years the use of sophisticated techniques to establish the origin of raw materials and artifacts from archaeological sites have permitted the delineation of prehistoric trade relationships. However, the identification of processes affecting the stability and change of prehistoric economic systems remain a vexing problem. This symposium will explore the potential directions of archaeological research on economic systems by defining new theories and models commensurate with archaeological data.

(19) DYNAMICS OF CULTURAL RESOURCE MANAGEMENT. The newness of conservation archaeology has caused a revolution of ideas among professionals and government stewards alike that has led into reactions not yet well thought out. Government agencies have not firmed up interpretations of public laws and executive orders but are attempting to do so. The profession does not know what is specifically required to fulfill environmental impact statements. We must recognize limits of trained man power, availability of funds, ideals for research, facilities, requirements of industry, and economic factors. It is imperative that clear guidelines be formulated involving agency requirements, the issuing of permits, quality of work, and long range conservation goals.

(21) ADVANCES IN ARCHAEOMETRY AND ARCHAEOCHRONOMETRICS. This symposium reports on advances and developments of new analytical and dating methods and new approaches and results from existing methods. Papers include reports from different groups working in amino acid and obsidian hydration dating as well as a progress report on the fluorine diffusion dating of chipped lithic materials.

(23) INFORMATION THEORY: MODELS AND MEASUREMENT OF ARCHAEOLOGICAL SYSTEMS. Information theory, developed in the fields of communciation theory, cybernetics and mathematical statistics, has recently proven useful in the quantitative analysis of archaeological data. Several such applications are explored in this symposium, ranging from questions of coding theory to quantitative tests of cultural laws and measurement of organization in social systems. The data bases considered, which include ceramics, stone tool assemblages, and mortuary patterns, indicate the diversity of contributions which information theory can make to the quantitative analysis of archaeological systems.

(24, 25) APPROACHES TO FAUNAL ANALYSIS IN THE MIDDLE EAST. The purpose of this symposium is to serve as a forum for discussion of different approaches to faunal analysis as dictated by differing sites, their problems, and the orientation of both excavator and analyst. Participants will be individuals presently engaged in the analysis of faunal materials from Middle Eastern sites. Emphasis will be placed on methods and approaches and not on the results of investigations. It is hoped that the inclusion of both zoologists and archaeologists trained in bone analysis will serve to promote a productive discussion of present concerns and of future directions for research.

(26) WILDERNESS AND CULTURAL VALUES. Wilderness legislation and current studies to increase the number of acres of Wilderness land both have implications for the management of cultural resources (both historic and prehistoric) within Wilderness areas. This symposium explores the conflicts with and benefits to our cultural resources as a result of Wilderness legislation and management practices.

(31) EXPANSION OF THE INCA STATE: A PERSPECTIVE FROM ARCHAEOLOGY AND ETHNOHISTORY. Several recent archaeological and ethnohistorical studies have focused on socio-political and economic expansion of the Inca state into coastal and



highland areas of the Central Andes. The theme of expansion provides the basis for arguments of relevance to substantive aspects of state development; for example, changing functions of the political system, economic participation of subjugated territories, population movement, resource use, and urbanization. Toward that end, the participants of this symposium present papers containing different kinds of data gathered from different parts of the Central Andes. In general, the aim of this symposium is to contribute to the broad framework in which we can organize our knowledge for the formulation of hypotheses regarding the development and spread of the Inca state.

(33, 34) EARLY MAN IN THE NEW WORLD: A VIEW AS WE APPROACH THE SEMI-CENTENNIAL OF THE FIRST PALEO-INDIAN DISCOVERY AT FOLSOM, NEW MEXICO. The program is designed to bring to light information on new sites in the Paleo-Indian field, as well as new developments related to old sites. Regional summaries and discussion of aspects of lithic technology are also included.

(35, 41) QUANTITATIVE ANALYSIS OF INTRASITE SPATIAL DISTRIBUTIONS. The symposium deals with quantitative approaches to the analysis of spatial distributions on an intrasite level. Given increased but diffuse interest in statistical manipulation of spatial data, the session will draw together scholars with shared interests and hopefully will facilitate exchange of ideas. On the theoretical level, the symposium should provide answers to questions which turn on the behavioral correlates of spatial associations. On the methodological level, it should provide a forum in which individuals can discuss the various analytical techniques currently in use (e.g., nearest neighbor analysis, dimensional analysis of variance).

(36) RECENT ARCHAEOLOGICAL WORK IN AFRICA AND THE NEAR EAST. Preliminary reports are presented of recent fieldwork undertaken in the Near East and Africa. Emphasis is on Paleolithic studies, including local dating and specific site investigations.

(37) REGIONAL SURVEYS IN THE SOUTHWEST: RESULTS AND PROBLEMS. A number of regional survey projects in the Southwest have been underway for several years. Previous symposia have caught many of these projects in early stages, and have emphasized research design, research prospects, and preliminary results. The time is right for taking stock of these projects at the mature stage of development they have now reached. Emphases will be on substantive results and evaluations of the advantages and problems found to date in the various research designs. Formal and informal discussions will provide opportunities for comparsion of archaeological and methodological results.

(38) UNDERWATER ARCHAEOLOGY. The current status of underwater archaeology is explored. Recent projects are discussed as well as developments in methodology. Topics include survey, excavation and interpretation of drowned prehistoric sites and shipwreck sites.

(42) NEW WORLD LITHIC ANALYSIS: REGIONAL EVALUATIONS. The last decade has seen a continuing increase and focus on lithic studies in the New World. Although much of lithic analysis is still concerned with using traditionally derived typologies of selected classes of artifacts for creating regional chronologies, many new and exciting analytical approaches and techniques are also being utilized to answer different kinds of questions. This symposium evaluates lithic analysis in the New World for the last decade, focusing on (1) the problems and questions being studied by lithic experts in each region; (2) the methods and techniques used for analysis in each region—and what has succeeded and what has failed; and (3) an evaluation of the present and future contribution of specialized lithic studies to the archaeology of each region.

**RECORDING SESSIONS**

Persons wishing to record scholarly sessions or portions of sessions should follow normal scholarly convention and obtain the permission of the person being recorded and of the chairman of the session at which recording is to be done. There should be no publication of such recorded material without following established procedures regarding permission and citation.

## ABSTRACTS OF PAPERS

Ackerman, Robert E. (Washington S) CONTRACT ARCHAEOLOGY AND ARCHAEOLOGICAL RESEARCH: THE NORTH TONGASS NATIONAL FOREST, SOUTHEAST ALSAKA. During the latter part of the 1974 field season, an archaeological survey of proposed timber harvesting areas on Chichagof and Baranof Islands (northern Alexander Archipelago) was conducted for the U.S. Forest Service. As part of a multiple-use planning team, the author, as an archaeologist, was asked to play the roles of resource management planner, educator, and ethnographer-politician, in addition to the familiar role of research investigator. These new role relationships are briefly explored in terms of a developing program of archaeological research studies in Southeastern Alaska. The report concludes with a discussion of the prehistoric and historic cultural relationships of the northern sector of the Alexander Archipelago. Data from the 1974 survey and the 1971 and 1973 research studies in the Icy Strait region are utilized and interpreted in the light of previously reported and new geomorphological and site chronological information.(28)

Adovasio, James M. (Pittsburgh) THE EVOLUTION OF BASKETRY MANUFACTURE IN NORTHERN MEXICO AND TRANS-PECOS TEXAS. Systematic, attribute oriented, comparative analyses of virtually all of the extant basketry collections from Northern Mexico and Trans-Pecos Texas permit the delineation of detailed developmental sequences of basketry manufacture in both areas. These 9000+ year sequences are presented and compared in terms of origins, technical affinities, and principal developmental trends.(16)

Adovasio, James M., R. Andrews, and R. Carlisle (Pittsburgh) PERISHABLE INDUSTRIES FROM DIRTY SHAME ROCKSHELTER. The manufacture of basketry, sandals, and cordage at Dirty Shame Rockshelter is discussed in terms of process and product. The evolution of these industries throughout the occupational sequence is detailed and compared to developmental sequences elsewhere in the Northern Great Basin. Utilizing the Dirty Shame perishable data in conjunction with data from other sites in the region, a general developmental sequence for all of the industries in question is generated for the entire Northern Great Basin.(17)

Adovasio, J. M. (see Stuckenrath, R.)(33, 34)

Agenbroad, L. D. (see Haynes, C. Vance)(33, 34)

Aguilera, Carmen (Consejo de Historia, INAH, Mexico) SPEECH SCROLLS IN THE FLORENTINE CODEX. The so-called "speech scrolls" appear in prehispanic codices and murals at least since Classic times, to denote basically two human actions: speech and singing and/or poetry. In Colonial times the functions and shapes of "speech scrolls" change in a way similar to some types of speech indicated in comic books. This phenomenon can be exemplified by the examination of "speech scrolls" in the Florentine Codex. Here the designs of the "speech scrolls" vary widely, in some cases because of the function, in others because of the style of the artist.(12, 13)

Aikens, C. Melvin (Oregon) EARLY OCCUPATION WEST OF THE ROCKIES: AN OVERVIEW. A review of the early and putatively early finds in western North America (excluding the Southwest) shows that no credible geologic, radiometric, or typologic support exists to adequately demonstrate human occupance of the region prior to the time of the fluted point horizon. Surface finds of fluted points have now become sufficiently numerous throughout the western United States that the presence there of a Llano-like Paleo-Indian horizon can no longer be reasonably doubted, though its precise character remains unclear. A lithic complex characterized by large modified lanceolate/foliate point forms (San Dieguito, Windust, Milliken), widespread in the western Intermontane region by at least 10,000 years ago, is hypothesized as derivative from a western fluted point horizon; an analogy is drawn with the Llano-Plano transition on the Great Plains.(33, 34)

Aikens, C. Melvin (see Minor, Rick)(17)

Allsburg, John B. Van, and Denise E. King (Michigan S) SHAPE ANALYSIS: A NEW APPROACH TO ARCHAEOLOGICAL DATA. Shape discrimination analysis, a quantitative technique developed by geologists, expresses the shape of an object in terms of harmonics. The computer program approximates the shape of the object through comparison of the real shape with a Fourier series. We will apply this technique to a collection of scrapers from the Finch site in California. The purpose of this research is to: (1) determine if shape analysis solves a basic problem of attribute measurement; (2) compare taxonomies that exclude quantitative measures with a taxonomy that includes shape; and (3) to evaluate this technique of analysis.(14)

Anawalt, Patricia (UCLA) DIFFERENTIAL USE OF AZTEC MILITARY GARMENTS: A TEXTUAL ANALYSIS. In the course of research on pan-Mesoamerican costume patterns



three classes of Aztec military garments could be distinguished: the warrior costume, tlahuiztli; the quilted armor, ichcahuipilli; and the tunic worn over the ichcahuipilli, ehuatl. It is the purpose of this paper to present a descriptive and functional analysis of these three types of military garb, drawing data from relevant codices and sixteenth century documents. The attempt is made to ascertain the social or situational context which determined the class of costume utilized, as well as the rank and status of the wearer.(43)

Anderson, Duane C. (see Shutler, Richard, Jr.)(33, 34)

Andreson, John M. (Illinois) and Raymond Sidrys (UCLA) OBSIDIAN SOURCES IN THE MAYA AREA. Our purpose is to standardize the existing data on the eleven obsidian sources in the Maya area. New data are also presented from a month-long survey during January 1974. The size and location of outcrops are emphasized, although quarry artifacts, hydration dates, and chemical characterization are also discussed.(43)

Andrews, R. (see Adovasio, J. M.) (17)

Arnold, J. Barto III (Texas Antiquities Committee) NEW MARINE MAGNETOMETER SURVEY TECHNOLOGY FOR UNDERWATER ARCHAEOLOGICAL APPLICATIONS. Instrumentation including proton magnetometer, radio positioning, and calculator-plotter-data recorder system was assembled for an inventory of the shipwreck site resources off a 25 mile segment of the south Texas coast. Hardware and software interfaces were developed for this instrumentation system as well as software programs for the vessel track plotter, calculating and recording Universal Transverse Mercator Grid coordinates for the position of each magnetometer reading and a rough plot for field analysis of data. Other programs were written for transfering data from cassettes to one inch magnetic tape, editing and finally the production of computer drawn contour maps of the magnetic data for final analysis. This marine magnetometer survey system was successfully utilized in locating numerous sites for further investigation through test excavations.(38)

Aten, Lawrence E. (Natl Park Service) COORDINATION OF FEDERAL DATA RECOVERY ACTIVITIES. Cultural resources include archaeological, architectural, and historic objects, structures, sites, and districts. To illustrate the federal government's policy with regard to these resources, four related papers are presented. The first deals with the foundation of laws upon which these procedures rest. The second discusses the resource management procedures that have evolved in response to these laws. To further illustrate the law-policy relationship, the third paper deals exclusively with the National Environmental Policy Act, and the development and synthesis of cultural resource data which must be prepared in compliance with it. The fourth paper summarizes the integrated federal approach to historic preservation and resource conservation.(19)

Ayres, James E. (Arizona) CULTURAL VALUES IN THE WILDERNESS: THE CULTURAL PERSPECTIVE. Most Wilderness areas contain cultural resources with both prehistoric and historic values. Because of the unique character and special status of the Wilderness areas, they create special problems and concerns for the resources located within them. An assessment of current legislation, activities, attitudes and events surrounding archaeological and historic sites in Wilderness areas are the subject of this discussion.(26)

Bada, Jeffrey L., and Pat Helfman (California-San Diego) FURTHER EVIDENCE OF THE ANTIQUITY OF MAN IN NORTH AMERICA DEDUCED USING ASPARTIC ACID RACEMIZATION REACTION. Recently published aspartic acid racemization ages for several California Paleo-Indians have suggested that man was present in North America at least 50,000 years B.P. Because of the important implications of these dates, we have carried out further analysis on various parts of one of the skeletons (Del Mar Man) in order to test the reproducibility of the earlier results. The results show that all bones from the skeleton yield the same D/L aspartic acid ratios, e.g., 0.50. Also, we have analyzed several other California Paleo-Indian skeletons and have found additional examples of fossil hominids which have ages of 50,000 years or more. We believe these results provide additional evidence that man was present in the New World earlier than originally thought.(21)

Baird, Ellen Taylor (New Mexico) EUROPEAN ELEMENTS IN BOOK IX OF THE CODEX FLORENTINO. Bernardino de Sahagun's encyclopedic work, the "Historia general de las cosas de Nueva Espana," has often been used by scholars for the information it contains on pre-conquest Mexico. However, the last complete version of the manuscript, the "Codex Florentino," was completed approximately 60 years after the conquest. Although the subject matter of the manuscript is predominantly pre-Columbian, the influence of the Spaniards is evident in the numerous European elements of style and form that appear in the illustrations. This paper analyzes the European pictorial elements in Book IX of the codex with particular emphasis on their significance, sources, and possible authorship.(12, 13)

Baker, James G. (Dallas, Texas) THE INTRODUCTORY GLYPH—OLMEC AND MAYA. A careful study of this hieroglyph reveals much about culture change in the proto-classic period. In the Maya lowlands (Tikal) early introductory glyphs are identical in form and function with the one recently found in the Olmec area on Stela C at Tres Zapotes, Veracruz, Mexico. Changes in the glyph as it was used on early highland Maya monuments

indicate Olmec influence was weaker there than in the lowlands. The glyphic evidence argues for direct cultural transfer from the Olmec area up the Usamacinta River to the Peten. The irregularities in highland glyphic texts rule out the highlands as the route for Olmec culture to diffuse to the lowland Maya. What we find in the highlands is influence from the Olmec, not the direct movement of Olmec peoples as we have in the lowlands.(43)

Baker, Vernon G. (Brown) VINYL-TOPPED AUTOMOBILES AND ARCHAEOLOGY: RESEARCH DIRECTIONS FOR THE AMATEUR AND ACADEMIAN. A study of vinyl tops on General Motors Corporation automobiles is presented to further emphasize the need for above-ground archaeology. Also, the study of current material culture is suggested as a possible means of enhancing communication between amateur and academic archaeologists. (27)

Bannister, Bryant, and William J. Robinson (Arizona) ADVANCES IN TREE-RING DATING IN ARCHAEOLOGY. In recent years the applications of tree-ring dating have greatly expanded in geographic coverage and in scope. The rapid growth of European dendrochronological efforts has resulted in the establishment of absolute tree-ring chronologies and the dating of historical and archaeological structures across northern Europe from Ireland to western Russia. Development of long floating tree-ring chronologies in Europe and the Near East gives promise of significant future advances. In North America, particularly in the American Southwest, tree-ring controls have also been extended in time and space and special attention has been focused on the development of new concepts and techniques for archaeological interpretation. Broader applications of dendrochronological data include recalibration of the radiocarbon time scale and reconstruction of paleoclimatic conditions.(21)

Barber, Michael (see Shane, Orrin C. III)(45)

Bayham, Frank E. (see Gasser, Robert E.)(35)

Bellis, James D. (Notre Dame) TIME CONTROLLED SURFACE PICKUP ON THE MOUND HOUSE SITE IN THE LOWER ILLINOIS RIVER VALLEY. In recent years, a number of efforts have been made to bring better controls to surface survey methodology. The efforts have dealt with spatial controls as well as various efforts to control the sample taken from these spatial units. At the Mound House site in the Illinois River Valley an experiment was conducted with time-controlled surface pickups. It was demonstrated that in terms of the percentages of classes of raw materials present on the surface, the first 30 minutes' pick-up was as accurate an indicator as a total surface pick-up which could take up to four hours.(14)

Benfer, Alice (Missouri-Columbia) NORTHERN MESOAMERICA. Lithic studies in Northern Mesoamerica have, until recently, been few, and generally based on unexcavated or poorly provenienced data. The few published studies are morphological descriptions and/or typologies based on tool morphology. These typologies were generally constructed for forming regional chronologies or to be used as chronological markers. Recent research has been focused in the Central Basin and surrounding areas and has been on excavated materials of good provenience, ranging in time from Early Classic to Post Conquest. With the advent of C-14, obsidian hydration dating, and better excavation controls, interests have shifted away from chronologies and toward other kinds of questions. Whole assemblage analysis to produce models of prismatic blade and core production; microwear studies of tools to determine function; assemblage description in terms of technological and functional rather than morphological attributes; the use of trace analysis to determine source areas and trade routes; and the study of craft specialization in obsidian industries are among the new approaches in lithic studies that are discussed, along with the traditional approaches.(42)

Berdichewsky, Bernardo (Texas, Austin) THE INCA CONQUEST OF THE PICUNCHE OF CENTRAL CHILE, AND THE CORRESPONDING MODIFICATIONS OF THEIR MODE OF PRODUCTION. The intention of this paper is to analyze the Mode of Production of the Picunche Indians of Central Chile (or Northern Araucanians), before the Inca Conquest, and how it was transformed by that event. When the Spaniards arrived in this region, the Picunche had been transformed in a short time, from one Tribal Economic-Social Formation to another of a Chiefdom. The presentation uses the archaeological and ethnohistorical data available for that area and period.(31)

Berge, Dale L. (see Matheny, Ray T.)(19)

Berger, Rainer (UCLA) ADVANCES IN RADIOCARBON DATING. Experience with collagen radiocarbon dates has shown that reliable dates can be obtained using the appropriate chemical purification techniques. This is based on a comparison of collagen and charcoal-based radiocarbon dates from different environments and age ranges. Moreover, radiocarbon dates compare favorably with amino acid racemization dates which can be used for calibration purposes if independent temperature measurements are available. Conversely, radiocarbon measurements can be employed to calibrate amino acid racemization dates. Bones have also been dated using the carbon dioxide located within the apatite structure. A number of magnetic intensity measurements have shown that the secular variations during



the last 50,000 years are not in excess of the variations during the last 10,000 years although there may have occurred a major magnetic excursion during the early part of the third decamillennium.(21)

Berger, Rainer (see Ericson, Jonathon E.)(21)

Betram, Jack (New Mexico) THE LAWS OF MAMMALIAN SPECIES DIVERSITY: IMPLICATIONS FOR PALEOECOLOGY, SUBSISTENCE THEORY, COMPARATIVE ANTHROPOLOGY, AND THE OVERKILL HYPOTHESIS. Empirical regularities in the distribution of mammalian species numbers, density, and biomass, when coupled with biogeographical theory, can be used as estimating equations for the evaluation of paleoclimatic variables. Predictions are made concerning past distributions of diversity; these predictions are tested using paleontological data. The empirical regularities so determined have surprising implications for the overkill hypothesis, as well as for the dynamics of human subsistence strategies under changing population pressure. Data from the late Pleistocene in the American Southwest, the African Vilafranchian, and from ethnographically known hunters and gatherers, are considered.(27)

Bishop, Charles A. (SUNY Oswego) THE OJIBWA COLLECTIVE-ATOMISTIC ARGUMENT RE-EXAMINED: ECONOMIC MODELS APPLIED TO HISTORICAL AND ARCHAEOLOGICAL DATA. The collective versus atomistic argument for the Ojibwa and other northeastern Algonkians has persisted for several decades without adequate resolution. Although the supporters of aboriginal collectivism have utilized ethnohistorical evidence to support their view, conceptual bi-polarization has distorted interpretation. A more accurate analysis involves the use of more refined models for evaluating both the early historical evidence and the prehistoric materials via a direct-historical-analogy model, avoiding over-generalization of the intricacies of economics and the way this is reflected in social organization. Modes of production, exchange, and ownership are here examined in terms of the range of possibilities between the extremes. While the collectivists tend to be "generally" correct, there are a number of areas in which the term collectivism is a misleading conceptualization. The analysis resulted in a more elegant and accurate description of the late prehistoric Ojibwa socio-economic system.(10)

Blackman, Crawford H., Jr. (Mississippi S) THE MACROSCOPIC APPROACH TO THE IDENTIFICATION OF CHERT SOURCES. It is proposed that the use of macroscopic lithologic traits is a practical and acceptable alternative to the use of some recent, more sophisticated techniques of lithic source identification, if the macroscopic method of classification is applied within the framework of a known geological context and of explicit assumptions about the nature of human cultural behavior.(14)

Bokonyi, Sandor (Archaeological Inst of the Hungarian Academy of Sciences, Budapest) CULTURAL AND ENVIRONMENTAL DIFFERENCES IN THE FAUNAL SAMPLES FROM FIVE EARLY NEOLITHIC SITES IN SOUTHWEST ASIA. The paper compares the animal bone samples of five sites—Umm Dabaghiyah, Tell es-Sawwan, Choga Mami in Iraq, Labweh in Lebanon, and Sarab in Iran—from the sixth millennium B.C. Each site represents a different environmental type. The animal bone samples of these sites can be divided into two sharply different types. In the first type (Umm Dabaghiyah) the domestic ratio is very low (just above 10%), in the second one it is very high (73% to 89%). In all of the sites the caprovines are the most important domestic species (54% to 97.5% of all domestic animals). Also, domestic pig and dog bones occur in each site, though they are very rare. On the other hand, bones of domestic cattle are probably not present in Sarab. The composition of the wild fauna depends completely on the environment of the sites. While in Umm Dabaghiyah no forest animals can be found (on the other hand, the onager, this typical step species, represents 66% to 70% of the wild animals), in the fauna of Labweh, Tell es-Sawwan, and Choga Mami there occur some forest elements, first of all the fallow deer, and a whole series of forest species (red deer, roe deer, wild swine, leopard, wild cat, brown bear, badger, beaver) represent a considerable ratio besides the step animals in Sarab.(24, 25)

Boone, Elizabeth Hill (Texas-Austin) TWO PAINTING STYLES IN THE CODEX MAGLIABECHIANO. The Codex Magliabechiano is a sixteenth century pictorial manuscript from Central Mexico and is assumed to be a copy of a now lost pictorial prototype. Although the derivative nature of the paintings in the Codex Magliabechiano precludes great irregularities in composition and iconography, two separate painting styles are apparent in the manuscript. One style appears to be especially close to the indigenous Indian tradition of graphic representation, while the other incorporates European pictorial elements. These two painting styles are defined and analysed in terms of line, color, form, proportion, and composition and their relative occurrence in the Codex Magliabechiano are discussed.(12, 13)

Brand, Donald D. (Texas-Austin) SOME PERSISTENT MYTHS IN THE ETHNOHISTORY OF WESTERN MEXICO: MESOAMERICAN ETHNOHISTORY—CODICES AND MANUSCRIPTS. Western Mexico, i.e., the northwestern portion of Mesoamerica, has had more than its share of erroneous concepts concerning the history of its peoples just prior to the Spanish conquest. Among the most persistent "myths" in the ethnohistory of Western Mexico are the following three. Despite little evidence in favor and considerable evidence against, it is still popular to claim that the Mexican ("Aztec") state extended to the

southwest as far as Zacatula and the mouth of the Rio Balsas. A sequence of local historians during the last hundred years have developed a fictitious political geography of the Nayarit-Jalisco-Colima region on the basis of an invented Chimalhuacan Confederacy. A blind reliance on a seventeenth century Spanish Franciscan chronicler has resulted in a general acceptance of the only origin and migration legend from the region, as provided by Pantecatl through Tello. Apparently the origin and persistence of such errors in Western Mexico can be attributed chiefly to the fact that Western Mexico was conquered by the Spaniards from a base in the Nahuatlan Valley of Mexico-Puebla region with a resultant Nahuatlan bias, and because all of the records of the conquest and early contact period were housed outside of Western Mexico.(12, 13)

Braun, David (see Nelson, Charles)(2)

Breternitz, David A. (Colorado) THE MESA VERDE: CULTURE AND/OR AREA? The available citable literature on that portion of the San Juan Anasazi designated as the Mesa Verde emphasizes investigations within the confines of Mesa Verde National Park. Recent and current research permit us to reevaluate the Mesa Verde and to look at population dynamics and environmental/climatic factors involved with Mesa Verde cultural evolution. Conclusions reached include: that the Mesa Verde Proper lies on the eastern margin of the Mesa Verde Culture "area"; it was initially occupied later than surrounding "lowlands"; and, also, later than adjacent localities which show more contact with the Chaco and Kayenta Anasazi. The results of recent excavations, inventories of surface manifestations, and ancillary studies is utilized to emphasize these propositions, as well as to comment on the problem of abandonment of the entire Mesa Verde region.(20)

Breternitz, David A. (see Smith, Jack E.)(37)

Bricker, Harvey M. (Tulane) LES TAMBOURETS: AN OPEN-AIR CHATELPERRONIAN SITE IN SOUTHWESTERN FRANCE. Preliminary archaeological and geological investigations at Les Tambourets (Couladere, Haute-Garonne) documented the presence of a rich Chatelperronian occupation level that had been known previously from surface collections. Results of sedimentological analyses by Henri Laville are summarized. A small series of stone tools is described, and preliminary observations are made about their lateral distribution patterns on the living floor.(8)

Brockington, Paul, and Anta Montet-White (Kansas) MASS DISTRIBUTION AND SHAPE VARIATION IN ARTIFACT ASSEMBLAGES. A Comp-U-Grid Graphic Digitizer System is used to record sets of metrical attributes describing (1) the shape and symmetry of the artifacts, and (2) the distribution of mass on either side of an artifact's long axis. The hardware is most effective in calculating perimeter and surface areas of the whole artifact as well as the surface area of portions of the artifact. Analysis of test samples from several assemblages are presented. In a final section, the paper discusses the significance of the above mentioned attributes for the study of lithic technology.(3)

Broilo, Frank J., and Charles A. Reher (New Mexico) RESEARCH AND MITIGATION CONSIDERATIONS IN THE REGIONAL CONTRACT SURVEY. Archaeological investigations conducted under the auspices of federal and state legislation regulating cultural resources should be implemented efficiently and in a manner congruent with contemporary professional research standards. Several recent articles (King 1971; Gumerman 1973; Lipe 1974) have focused on the difficulty of integrating theoretical, problem-oriented research designs with contract obligations, yet have emphasized the necessity of doing so if we are to collect data amenable to current explanatory concerns and successfully fulfill contract and legislative requirements. It is suggested that an inventory survey based upon an explicitly-defined, theoretical, interdisciplinary research design should culminate in an efficient and economical mitigation program. The systematic collection of comprehensive cultural and environmental data during survey should provide a data base which permits sampling strategies to be employed in succeeding mitigating action. These considerations for regional or sub-regional surveying methodology were recently operationalized for the Coal Gasification Project Survey, a contract survey of approximately 70 square miles in northwestern New Mexico which yielded over 700 sites. Hypotheses on the nature of Paleo-Indian, Archaic, Anasazi, and Navajo settlement-subsistence systems were generated and tested. The resultant explanatory devices allow relatively precise predictions of site locations and site densities, and provided the basic understanding of archaeological manifestations necessary for an elegant mitigation design.(9)

Bronitsky, Gordon (Arizona) TRADE IN THE UNITED STATES SOUTHWEST: A CONSIDERATION OF MODELS. A major trend in recent archaeological thinking has been the development of the concept of culture as the primary means of human environmental adaptation. The numerous mentions of artifacts and materials recovered from archaeological sites which originated at great distances from the site, as well as the extensive trade networks known to have linked historic local communities with each other and regions as distant as California and New Mexico, suggests that Southwestern populations in the United States may have employed trade as one mechanism to cope with environmental stress. This paper examines the use and non-use of the trade concept in the archaeological literature dealing with sedentary agriculturalists in the Southwest. A model of trade based on concepts derived from ecology and anthropology will then be proposed and tentatively compared to existing data.(27)



Brooks, Alison S. (George Washington) FORMAL ANALYSIS OF AURIGNACIAN STONE TOOLS IN SOUTHWEST FRANCE. Excavations by Movius at the Abri Pataud revealed a complex series of Aurignacian levels. Attribute analysis of the stone tools, together with those from other Aurignacian sites in Southwest France, suggests greater variability both within major tool classes and between assemblages than was recognized in the classic evolutionary framework. The new evidence implies that this standard sequence is based on mixed collections and that unilineal evolutionary schemes of this type are not applicable to the Aurignacian. Attribute analysis is now being used by other Western European archaeologists to explore formal, functional, stylistic, and technological variability in Aurignacian artifacts.(8)

Brooks, Dan (Arizona) PREHISTORIC SOIL AND WATER CONTROL IN THE AMERICAN SOUTHWEST: A CASE STUDY. Detailed studies of prehistoric soil and water control techniques in the American Southwest are few in number. A system of 32 check dams on Horse Flats, a high plateau in Southeastern Utah, allowed the intensive investigation of one such technique. Palynological, climatological, edaphic, and cultural data were gathered through test trenching, intensive survey, and mapping. The hypothesized agricultural function of the check dams was supported through the presence of Zea mays pollen and a suitable macro- and micro-environment. Stratigraphic evidence suggested the natural accumulation rather than the human transport of check dam soil. Palynological analysis of the check dam fill provided an environmental reconstruction indicating a warmer and drier period. The time span represented by the fill was determined to be between A.D. 1000 and A.D. 1300. Ten late Pueblo (Anasazi) sites were shown to be spatially and temporally related to the system.(20)

Brooks, H. K. (see Carl J. Clausen)(38)

Brooks, Sheilagh, and Richard H. Brooks (Nevada) PHYSICAL ANTHROPOLOGY/DEMOGRAPHY AND ARCHAEOLOGY. The usual model utilized to delineate archaeologically recovered skeletal populations is based on a physical stereotype derived from a series of anthropometric indices or measurements. This model has been criticized by osteologists, as well as archaeologists, since stereotypes do not allow for range of variability and the anthropometric indices and measurements have little possibility of genetic interpretation. It is proposed to introduce into Great Basin skeletal analysis a new model based on the frequency of occurrence of a series of cranial and post-cranial discrete morphological traits. These traits have been demonstrated to differentiate successfully archaeological skeletal series in other geographical areas. A major consideration in their use is their potential for a relatively simple genetic control, implying the possibility of such demographic interpretations as inbreeding, population movements, and contacts among prehistoric peoples of the Great Basin.(5)

Brooks, Richard H. (see Brooks, Sheilagh)(5)

Browman, David L. (Washington) CONTRIBUTIONS OF CHIRIPA IN THE DEVELOPMENT OF THE TIWANAKU EMPIRE. The Bolivian site of Chiripa, on the edge of Lake Titicaca, is important in understanding the development of the Tiwanaku Empire. At a time contemporaneous with the Early Horizon of Peru, Chiripa begins exhibiting structural and conceptual features found at the Tiwanaku capital some 1000 years later. Part of Tiwanaku theology is rooted in themes found at Chiripa. The economic underpinning of the Tiwanaku empire, the control of regional and long-distance trade, by means of long distance llama trade caravans, may be developed as early as the Chiripa occupation in the area.(39)

Brown, James (see Peebles, Christopher)(7)

Brown, Kenneth L. (Pennsylvania S) THE VALLEY OF GUATEMALA: A HIGHLAND PORT-OF-TRADE. The paper discusses both the conquest model, in which Teotihuacan controlled the Valley of Guatemala during the Middle Classic, and the port-of-trade model, in which Teotihuacan was one participant in long distance trading activities. Recent data from other sites in the Valley demonstrate: (1) heavy influence from the Mayan area to the north of San Antonio Frutal, and (2) a combination of northern Maya and Teotihuacan traits in the architecture and artifacts at Solano. The conquest model is not capable of explaining this data. The port-of-trade model predicts these findings with a high degree of accuracy.(43)

Bruhns, K. O. (San Francisco S) ZAPATERA ISLAND, NICARAGUA: NEW DATA ON ANCIENT SETTLEMENTS. A brief site survey in August 1974 on Zapatera Island, Nicaragua, revealed a new large village site with what seem to be ceremonial structures and a large cemetery associated. The long known site of Punto Zapote was revisited and, due to its having been very recently cleared of jungle, was sketch mapped. It was seen to be much larger than had been suspected, with residential areas in addition to the already known "ceremonial" structures.(39)

Bryant, Vaughn M., Jr. (Texas A&M) POLLEN ANALYSIS OF PREHISTORIC HUMAN COPROLITES FROM FRIGHTFUL CAVE, COAHUILA, MEXICO. This report relates to information derived from the pollen analysis of 47 human coprolite specimens recovered during the excavation of Frightful Cave located in the state of Coahuila, Mexico. The age of

the coprolites range from 7500 B.C.-A.D. 300 and are grouped into three major categories based upon their provenience in the site. The data from these 47 human coprolites are used to: (1) reconstruct prehistoric diet patterns, (2) predict specific periods of site occupancy, and (3) distinguish between economic and background pollen types. In addition, the coprolitic data are used for making limited generalizations concerning possible vegetational changes in the Frightful Cave area during the past 9500 years.(16)

Button, Aileen F., and L. Lewis Johnson (Vassar) DEBITAGE ANALYSIS: ARCHAEOLOGICAL AND EXPERIMENTAL. In trying to understand the manufacturing trajectory which Aguas Verdes knappers from Northern Chile followed in making points, it was discovered that there was a strong positive correlation between a number of flake attribute states. From analyzing the archaeological collection it was impossible to decide whether these were due to technological constraints or to individual knapping patterns. Therefore, we have made duplicates of the Aguas Verdes tools out of obsidian and the tuff used by the Aguas Verdes knappers in order to produce similar debitage. Our analysis of this debitage, produced by two workmen, indicates the reasons for attribute clustering in this industry.(3)

Byrd, Kathleen Mary (Florida State Museum) PREHISTORIC CARIBBEAN FISHING: A ZOOARCHAEOLOGICAL ANALYSIS. Prehistoric Caribbean inhabitants had a wide range of marine fish resources available for exploitation. Based on archaeologically recovered faunal remains, however, not all these resources were equally utilized. Some faunal assemblages show an abundance of one particular species or type of fish but a complete lack of another kind. Since most species are restricted to a particular habitat and possess various feeding habits and other behavioral traits, not all fishes are equally susceptible to a specific fishing technique. As a result, different methods are employed to obtain different species. The fish remains from several prehistoric sites are examined to postulate existing fishing techniques from species' habitats and behavioral patterns.(2)

Callahan, Errett (Virginia Commonwealth) FLAKE REMOVAL SEQUENCE AND CULTURAL INFERENCE. An intensive study of several Solutrean laurel leaf points from the famous Volgu cache at Saone-et-Loire, France, reveals a unique and diagnostic approach to the final stage of percussion biface reduction. A systematic reduction approach was found to be present in varying degrees in the following categories: direction of flake sequence, flake removal sequence per edge, per half, per face, per margin, and around the cross-section. All conceivable variables of each of these categories were classified, coded, and keyed to the archaeological units. In addition, a consistency scale was devised to determine the degree of adherence to the hypothetical norm. Replicative experiments were performed to test the feasibility of the apparent reduction system, and to determine the possibility of making a true replica of a Solutrean laurel leaf using known direct percussion knapping procedures. The results of the analysis and replicative experiments were used to create a model for separating imitation or approximation from replication and for inferring true cultural affinity for any finished biface specimen with its supposed tradition.(3)

Callahan, Errett (see Randall, Nancy)(3)

Canouts, Veletta (Arizona State Museum) MANAGEMENT STRATEGIES FOR EFFECTIVE RESEARCH. The picture of salvage archaeologists struggling frantically to rescue one last artifact as water laps at their feet is no longer appropriate. Effective operationalism of archaeological theories, methods, and techniques, an issue generally ignored in the discipline, is changing the picture within cultural resources management. This paper discusses several management strategies that maximize research returns through a more efficient use of time. These strategies related to three broad management principles: (1) each stage of research should be a refinement of the preceding stage; (2) research continuity should insure that the project is independent of a single researcher's commitment; and (3) research should be utilized as a cumulative base upon which subsequent research projects can build. Examples from the author's experience in project direction illustrate these principles.(9)

Carlisle, R. (see Adovasio, J. M.)(17)

Carmack, Robert M. (SUNY Albany) NEW QUICHEAN CHRONICLES FROM HIGHLAND GUATEMALA. A report is presented on the recent discovery of several sixteenth century chronicles written in the Quiche language. Included among these documents was the original of the "Title of the Lords of Totonicapan." The methods by which the documents were found, and their relationship to present-day social setting in highland Guatemala are described. Each document is discussed in terms of its specific contents, its relations with other known chronicles, and its significance for Quichean studies. Finally, the corpus as a whole is discussed in terms of its significance for Mesoamerican studies as a whole. As part of the talk, the several pictorials found in the documents are illustrated and discussed.(12, 13)

Carstens, Kenneth C. (Washington) SURFACE ARCHAEOLOGY OF MAMMOTH CAVE NATIONAL PARK, KENTUCKY. This paper includes an account of archaeological fieldwork and analyses carried out during the past two academic years (1973-75). The work described is closely related to earlier and continuing investigations of prehistoric cave miners and horticulturists in Mammoth Cave National Park, and complements and supplements those investigations by focusing on the surface archaeology of the cave area.(14)



Casteel, Richard W. (USGS) COMPARISON OF COLUMN AND WHOLE UNIT SAMPLES FOR RECOVERING FISH REMAINS. Comparisons were made between fish faunas recovered from entire excavation units and sorted in the field by the excavators and fish faunas from column samples recovered from the same units and examined in the laboratory with aid of microscopic examination. The results indicated that the smaller column samples provided adequate control for defining the number of species utilized and often surpassed the whole unit analyses by showing the presence of smaller individuals or species not recovered from the larger units. Microscopic examination of small samples appeared to provide a much needed addition to the commonly utilized methods of sampling for archaeological fish faunas.(11)

Chang, Claudia (see Trott, J. James)(20)

Chapman, Jefferson (North Carolina) BIFURCATE BASE PROJECTILE POINTS: A CULTURE HORIZON MARKER IN EASTERN NORTH AMERICA? Using as comparative base data the St. Albans site in West Virginia and the recent material from the Rose Island site in Tennessee, the distribution, temporal placement, and associations of bifurcate base projectile points in eastern North America are examined. Hypotheses concerning the point type as a horizon marker or as a specialized tool type correlated with certain activities are presented.(45)

Chapman, Richard (New Mexico) THE SOUTHWEST. The present state of stone tool analysis within the American Southwest is best characterized as a "shot-gun" approach to a variety of specific problems concerning human technological behavior. Overt concern with ideational determinants of tool manufacture, as reflected in reconstruction of "cultural-historical" sequences, has served until recently as a primary problem orientation. Within the last decade questions of tool function have been asked with increasing frequency. Analytical methodologies in this regard have generally focused upon assemblages as units of analysis, with emphasis being placed upon microscopic examination of wear patterns, and their covariation with tool morphology. Specific problems approached through this assemblage analysis include isolation of differential tool use activities both within site locations, and between site locations within regions. Non-ideational questions of tool manufacture are being approached through both tool and debitage analysis. Productive ongoing research is being directed toward isolation of changes in reduction strategy imposed by distance of site location of tool use from material source location, and evolutionary changes in subsistence strategy of human populations within a region. Definition of material source locations within the Southwest is being attempted at present largely through observational criteria, although neutron activation has been employed successfully with respect to obsidian materials. Major needs critical to further research in prehistoric technological behavior include an effective structure of communication among lithic specialists, and a theory of human technological behavior.(42)

Chartkoff, Joseph L. (Michigan S) GREAT QUESTIONS AND OPAQUE HYPOTHESES: TESTING INADEQUATE ALTERNATE EXPLANATIONS FOR AGRICULTURAL ORIGINS. There is often an inverse relationship between the scope of a question and the precision of possible answers, yet the pursuit of significant gains in knowledge draws attention to the most general questions. Explaining the origins of agriculture is such a problem. This study focuses on the question of why there was an adoption of food production technology in the Near East around 8000 B.C. It considers a number of possibly adequate and not-so-adequate proffered explanations and discusses how some tests of the alternate hypotheses were conducted. It views gain in knowledge as changes in the degrees of confidence with which any given proposed explanation is regarded as true or false. It argues that confidence levels can be changed even allowing for inadequacies in both hypotheses and test data.(4)

Cheek, Annetta (Tulsa) HISTORIC RECORDS AND THE STUDY OF ACCULTURATION: A CASE STUDY. The site of Quiburi (Arizona EF:8:1) was excavated by DiPeso (1953) and was interpreted by him as the location of two historic Sobaipuri (Piman) villages and a Spanish presidio, dating A.D. 1692-98, A.D. 1704-62, and A.D. 1772-89, respectively. Other authorities have questioned this interpretation. DiPeso's report of the assemblages is compared to historic information in an attempt to identify the nature of the site and to elucidate the course of acculturation of aboriginal populations by European peoples.(20)

Cheek, Charles D. (Tulsa) JADE, STONE MONUMENTS, AND THE OLMEC. Observations on the distribution of the known contexts of Olmec jades indicates that with a very few possible exceptions all such jades occur in a post 900 B.C., or Middle Formative, context. This is approximately the same time that there was a shift in emphasis away from monumental sculpture in the Olmec area. It is suggested that the shift from monumental sculpture to the use of jade objects and green stone pavements is essentially a substitution of one ceremonial medium for another.(43)

Ciolek-Torrello, Richard, and Susan Ciolek-Torello (Arizona) RECONSTRUCTION OF ACTIVITIES BY FORMAL AND SPATIAL ANALYSES. Artifacts from habitation rooms at Grasshopper, a fourteenth century pueblo community in East-Central Arizona, are analyzed in terms of formal characteristics and spatial associations. A Selgem computer storage system is employed to retrieve data for analysis by a variety of techniques. The

archaeological context of this community contains a wealth of artifacts in direct association with occupational surfaces. This situation provides a unique opportunity for the use of formal and spatial analytic techniques in the reconstruction of prehistoric activities.(35)

Ciolek-Torrello, Susan (see Ciolek-Torello, Richard)(35)

Clark, G. A. (Arizona S) SPATIAL ASSOCIATION AT LIENCRES: AN EARLY HOLOCENE OPEN SITE ON THE SANTANDER COAST, NORTH CENTRAL SPAIN. With the aid of a computer, an nth order nearest neighbor analysis is performed on classes of lithic data from Liencres, an open site on the Spanish coast. Significance of the degree of clustering measured by the statistic is assessed using the standard normal variable. Hanson's (1974) modification of Whallon's (1974) method for determining spatial association of artifact types is then employed to define use areas within the site. The so-called "shared-tool" method is thought to provide a better measure of the association among objects than the "shared area" approach originally advocated by Whallon. Use areas so defined are subsequently compared statistically using contingency table analyses. A multiple, stepwise discriminant analysis evaluates the adequacy of criteria used in group formation.(41)

Clark, J. Desmond (California-Berkeley) RECENT ARCHAEOLOGICAL STUDIES IN EASTERN ETHIOPIA. During the 1974 winter season work was carried out at the south end of the Afar Rift and base of the Southeast Plateau. In the west (Garibaldi crater and Lake Basaka areas) an important series of loams and vertisols was found containing a sequence of "Middle Stone Age" working floors, overlain by surfaces with a developing sequence of assemblages in the East African blade tool tradition. At Lake Basaka occupation sites with three successive stages of this blade tradition were found associated with former high lake levels, the earliest dating to ca 11500 B.P.; burials and fauna were associated with the second of these stages and a stone bowl with the third. Aladi Springs near Afdem yielded a late "Middle Stone Age" stratified beneath a small blade assemblage dated to ca 11000 B.P. Porc Epic Cave, Dire Dawa, was revisited and re-excavated yielding a "Middle Stone Age" contained within breccia sealed by a massive stalagmite curtain. The results of the 1975 season on the Southeast Plateau are also reported briefly and comparisons made with the sequence in the Rift.(36)

Clausen, Carl J. (Texas Historical Comm) and H. K. Brooks (Florida) THE CLIMATIC AND ENVIRONMENTAL IMPLICATIONS OF THE FLORIDA WARM MINERAL SPRINGS EARLY MAN SITE. Underwater investigations at Warm Mineral Springs in coastal Sarasota County, Florida, carried out intermittently from 1959 to early 1972, have provided evidence of the presence of man in that area approximately 10,000 years ago. A sample of wood from a level of stratified sediment on a ledge in the Spring in which a human vertebra was discovered, provided a radiocarbon date of 8310 B.C. (10260±190 B.P., Gak-3998). Wood samples from the next two superior 10 cm levels of the test also returned dates in excess of 10,000 radiocarbon years old. These dates are supported by three dates on charcoal samples from the same zone secured independently by Brooks. A second human bone, a fragmentary ilium was recovered a few centimeters outside the test in sediments of similar age. These specimens, those of a child approximately six years of age, may prove to be the earliest, closely dated, human remains so far discovered in North America. Of importance far surpassing the early man find at this spring is the detailed record of environmental conditions for this period preserved in these sediments through apparently unique circumstances of water chemistry and spring morphology. Ten thousand year old leaves, budding twigs, nuts, pine cones, pollen, and even algal spores, as well as invertebrate and vertebrate remains, the latter especially well represented, ranging from fish and amphibian to man, are present in the lower zone of the sediment in astonishing profusion and condition. Preservation of these organic materials is primarily attributable to the general absence of dissolved oxygen in the conate water filling the spring and the now constant year round water temperature of approximately 30.5°C in the upper portions of the spring. A preliminary analysis of the evidence amassed during this research indicates that somewhat cooler and drier, perhaps on occasion arid, conditions than exist at present in this area prevailed during this early period. Physical and geochemical evidence bearing on the local climatic condition and possible implications for climatic variation over the southern half of the North American continent during this period are discussed.(38)

Clay, R. Berle (Tulane) THE SIGNIFICANCE OF ATTRIBUTE VARIATION: A VIEW FROM THE PROTO-MAGDALENIAN. The significance of attribute variation in classes of lithic tools from the Proto-Magdalenian, the Perigordian VI, the Magdalenian II, and the Magdalenian III is considered; the sites dealt with are the Abri Pataud and Laugerie-Haute. Attribute analysis is compared with traditional analyses of variation based on tool-type frequencies. The advantages of an attribute approach are stressed.(8)

Cleere, Henry F.(32)

Clutton-Brock, Juliet (British Museum) A ZOOLOGIST'S APPROACH TO PREHISTORY IN THE MIDDLE EAST. Certain straightforward zoological questions are posed for the mammalogist who undertakes to work on the animal remains from an archaeological site. In unravelling and analyzing the results of this work the zoologist is tempted, and indeed expected, to broaden his subject and to speculate on the socio-economics of the human



population whose food remains he is investigating. The modern archaeologist expects the animal bone report to include comments on site-catchment analysis, slaughter patterns, the relative amount of meat provided by different groups of livestock, and the old, thorny problem of the minimum number of individual animals represented. The question is asked, and it is hoped that discussion will follow, on whether the zoologist can really provide valid answers to these topics or whether it might not be more rewarding to concentrate on restricted zoological problems. In the Middle East, for example, the correct identification of sheep and goat bones and specific determinations of the remains of gazelle and equids are not often attempted. To tackle these basic problems could be most rewarding for the implications that may be deduced on the past distributions of wild species, on biotope changes and the effects of hunting by man, and on the micro-evolution of the species concerned.(24, 25)

Cockrell, W. A. (Florida Bureau of Historic Sites & Properties) IMPLICATIONS OF SUBMERGED ARCHAEOLOGICAL SITES ON FLORIDA'S CONTINENTAL SHELF. Research on submerged prehistoric archaeological sites is discussed, focusing on nature and quality of data recovered, and potential for future data recovery, as well as some revised conceptualizations which can be formulated for testing.(38)

Cole, David L. (Oregon) DIRTY SHAME ROCKSHELTER, MALHEUR COUNTY, OREGON: EXCAVATION AND CULTURAL FEATURES. Dirty Shame Rockshelter, located in the southeastern corner of Oregon, was excavated by a University of Oregon field crew in 1973. The site was chosen for excavation because of its potential for revealing an upland riverine adaptation in an area occupied by Great Basin peoples. Excellent state of preservation and expectations of evidence of long, reasonably continuous occupation were considerations in the research proposal that won National Science Foundation support. The site was excavated, as possible, according to stratigraphic divisions. Three sedimentary divisions were: Stratum 1, an accumulation of very dry occupational debris dating from after 4000 B.C. and somewhat obfuscated by underground burning and subsequent settling; Stratum 2, a deposit of ash and silts, not as dusty as Stratum 1, and with diminished preservation, dating between 5800 B.C. and 4000 B.C.; Stratum 3, silts and water laid deposits holding mostly non-perishable artifacts, having C-14 dates of 6955 B.C. and 7550 B.C. Stratigraphic divisions within Stratum 1 were based upon cultural features including a thatched hut dating from around A.D. 200, and earlier layers with quantities of sandals, textiles and other artifacts and cultural debris. Divisions within Strata 2 and 3 were based primarily upon arbitrary excavation units.(17)

Collins, Michael B. (Kentucky) LITHIC TECHNOLOGY AT THE ABRI PATAUD AND LAUGERIE-HAUTE, FRANCE. Technological attributes of Solutrean stone implements and debitage samples, recovered by Smith and Bordes from Laugerie-Haute (Ouest), were examined. Analogy with experimentally derived correlates between knapping behavior and artifact attributes permitted interpretation of Solutrean flaking technology. Behaviors concerning material acquisition, initial reduction, primary trimming, secondary trimming, refurbishing, and disposal are described for each Solutrean period. Preliminary examination of debitage from Pataud: 3, 4, and 5 (Perigordian VI, Noaillian, and Perigordian IV, respectively) provides evidence of contrasting technological strategies applied to the same natural resource base of chippable stone. The adaptive significance of these strategies is appraised.(8)

Collins, Michael B. (see Fenwick, Jason M.)(42)

Compagoni, Bruno (Instituto Italiano per il Medio Ed Estremo Oriente) THE WILD FAUNA AT SHAR-I SOKHTA: EVIDENCE FOR NATURAL ENVIRONMENT IN AN URBAN SITE (24, 25)

Conrad, Geoffrey W. (Smithsonian) CHIQUITOY VIEJO: AN INCA ADMINISTRATIVE CENTER IN THE CHICAMA VALLEY, PERU. Archaeological investigations at Chiquitoy Viejo in the Chicama Valley revealed that the site is an Inca administrative center built along the coastal highway. The ruins are dominated by a large compound containing several different functional units. These units are described and interpreted. The compound as a whole is then interpreted as the seat of an important provincial functionary whose primary duties involved the supervision of commerce along the highway. Finally, the site's implications for the Inca administration of the North Coast are discussed.(31)

Cumbaa, Stephen L. (Florida) COASTAL RESOURCE UTILIZATION AND CROSS-CULTURAL DIETARY CHANGE IN THE SPANISH COLONIAL PERIOD. Through a combination of factors including historical accident, political and military design, communications, and failure to successfully exploit interior regions, the focus of the Spanish colonists in Florida and the Caribbean area was on the coastal areas for habitation as well as food gathering and production. Spanish soldiers and friars were not trained farmers and depended primarily on imported provisions, domestic animals originally brought from Spain, and on trade with native peoples for New World cultigens, wild game, fish, and shellfish. Aboriginal food habits and lifestyles changed as well, becoming most marked in mestizo households. Detailed dietary analysis gleaned from documents and archaeologically recovered materials enables comparison of energy flows between groups of differing social status in the Spanish Colonial period.(2)

Cummings, Calvin R. (Natl Park Service) SUMMARY OF NATIONAL PARK SERVICE UNDERWATER ARCHAEOLOGICAL ACTIVITIES. The National Park Service has been developing a comprehensive program for dealing with all phases of its underwater archaeological responsibilities. The Service is involved at several levels in dealing with submerged cultural resources, both in its own Park areas and in an advisory and review role with other agencies and institutions. This paper attempts to outline these different functions and illustrate the way in which the service is seeking to complement and align its resource management responsibilities with pure research objectives. It is shown how this overall approach to underwater archaeology will assume a problem-oriented direction and produce meaningful data in an anthropological sense rather than merely help document unique historical events. Finally, the paper presents examples of ways that underwater archaeology can play a part in "total anthropological" research designs for given park areas.(38)

Curren, Cailup B. (Alabama) PREHISTORIC OCCUPATION OF THE MOBILE DELTA AND MOBILE BAY AREA OF ALABAMA. Recent archaeological survey and excavation in Alabama has revealed intensive prehistoric harvesting of both Rangia cuneata (marsh clam) and Crassostrea virginia (oyster) over a widespread range in the Mobile Delta-Mobile Bay area. In this lowland delta and estuarine bay aboriginal occupants successfully lived from Archaic through Historic times.(2)

Dahlgren-Jordan, Barbara (INAH, Mexico) CREATION MYTHS IN THE CODICES. Several of the pre- and post-Hispanic codices that have survived offer documentation (illustrations) on subjects related to Mesoamerican cosmogony and cosmology. Some of these codices seem to have originated in different Mesoamerican subareas and might therefore present different local, tribal, or "national" historical and religious traditions or different priestly schools (e.g., dedicated to a specific deity). This paper is an attempt to correlate the illustrations to written sources in order to establish significative similarities and differences.(11, 12)

Dalton, George (Northwestern) ABORIGINAL ECONOMIES IN STATELESS SOCIETIES: INTERACTION SPHERES. The original formulations of potlatch and kula (by Boas and Malinowski) were either misleading or incomplete. Recent work, such as A. Strathern, "The Rope of Moka," and A. Rosman and P. Rubel, "Feasting with Mine Enemy," provides more convincing interpretations of the meaning and importance of "ceremonial exchanges," and allows one to show the connections between ceremonial exchanges and basic political and economic structures of those societies that had ceremonial exchanges. In all this, several distinctions are crucial: (1) the distinction between "aboriginal" or "Pre-colonial" societies and these societies after they became subject to American or European colonial control; (2) the distinction between "stateless" societies and those tribal kingdoms and peasant states that had central government; (3) it is also necessary to understand the distinction between "primitive valuables" (e.g., kula bracelets), "primitive money" (e.g., cowrie shells used in market place purchases), and "cash" (modern money such as dollars and francs). The important characteristics of aboriginal economies in stateless societies that lead to the formation of what Radcliffe-Brown called "relationships of alliance" with outside groups—which, in turn, create what Struever calls "interaction spheres"—are: (a) small groups (lineages, lineage clusters, sub-clans) of varying size and varying access to food and resources; (b) the vital roles—political, economic, social—of corporate descent groups; (c) leadership roles: big-men, lineage heads, sub-clan leaders; (d) primitive valuables; (e) feud, raid, revenge, death compensation, warfare with enemies, and dispute settlement among allies. There are four networks of relations of alliance. These are peaceful and special relationships between corporate descent groups (among whom non-lethal dispute settlement is the rule, and between whom material transactions and transfers of women in marriage constitute necessary parts of alliance). These networks or interaction spheres are: (1) warfare alliances, in raiding, feud, revenge, and peace-making; (2) marriage alliances and bridewealth; (3) ceremonial exchanges, such as kula and potlatch, which, aboriginally, were done only among allies; (4) ordinary external trade, usually by gift-exchange, occasionally by market exchange.(18)

Davis, Hester A. (Arkansas Archeological Survey) THE PUBLIC AND CULTURAL RESOURCE LEGISLATION: REACTION AND RESPONSIBILITY. By and large, the great American public is blissfully unaware of laws which affect or protect archaeological and historic resources, except for the possible exception of the 1906 Antiquities Act. They are somewhat more aware of specific preservation projects, particularly those that affect restoration of historic homes. Misinterpretation and/or misunderstanding has often resulted from uninformed interest. However, a large number of non-archaeologists and non-historians are interpreting the laws in light of their own needs and requirements—as with federal agencies—or to their own advantage—as with American Indians. More awareness by more people of the potential of the laws for use and abuse would considerably aid in preservation of information and resources. The reaction is generally uninformed; the responsibility is both ours and theirs.(19)

Dean, Jeffrey S. (Arizona), Alexander J. Lindsay, Jr. (Museum of Northern Arizona), and William J. Robinson (Arizona) THE LONG HOUSE VALLEY PROJECT. One objective of the Long House Valley Project, a joint undertaking of the Laboratory of Tree-Ring Research and the Museum of Northern Arizona, is an investigation of the responses of a local Kayenta Anasazi population to environmental changes that geological and dendroclimatological



studies show to have occurred between A.D. 1150 and A.D. 1300. Preliminary analyses of data gathered during an intensive survey of the valley indicate that significant population movements, major changes in settlement and site patterning, shifts in subsistence technology, and inferred changes in community organization coincided with the perceived environmental changes.(37)

De Atley, Suzanne, P. (see Findlow, Frank J.)(44)

DeBloois, Evan I. (U.S. Forest Service) A SUMMARY OF THE FIRST FOUR YEARS OF THE ELK RIDGE ARCHEOLOGICAL PROJECT, SOUTHEASTERN UTAH. The Elk Ridge Archeological Project was initiated by the U.S. Forest Service in 1971 and has now seen the completion of four seasons of fieldwork. Analysis of the large quantities of data collected is still in progress by both Forest Service archaeologists and archaeologists working under contract. Intensive ground surveys have been conducted during the summers of 1971, 1972, 1973, and 1974. In addition, a helicopter was used this season to survey several canyon systems and to support the excavation of a previously undisturbed Pueblo II site. To date, 2200 archaeological sites have been located and reported. A summary of the project and some of the results are presented.(37)

Deevey, Edward S. (see Wiseman, Frederick Matthew)(27)

DeGarmo, Glen D. (UCLA) DISTRIBUTION OF ACTIVITIES AT COYOTE CREEK, SITE 01. Identification and evaluation of behaviorally meaningful partitions in intra-settlement distributions of artifacts require at least two prerequisites: (1) identification of the probable former use of artifacts entering into the analysis, and (2) formulation of at least general models for the expected distributional partitions. The results of distributional analyses in which the above two prerequisites were satisfied are described. The archaeological data used in the analyses were excavated from a P-III Pueblo located in the Upper Little Colorado region of Arizona.(35)

Dibble, David S. (Texas-Austin) THE INFIERNO PHASE: EVIDENCE FOR A LATE PREHISTORIC OCCUPATION IN THE NORTHEASTERN CHIHUAHUAN DESERT MARGINS. Direct archaeological evidence of late prehistoric occupation in the lower Pecos-Devils River drainages (roughly coterminous with the present northeastern Chihuahuan Desert margin) has been limited. Most of the data available from the region are interpreted as indicating general continuity in adaptive patterning throughout middle-to-late prehistoric occupations. Recently, however, an extensive site in the lower Pecos valley has been investigated and is hypothesized to reflect a late prehistoric occupation in the region by hunting groups of significant size; further, a hypothesis regarding a late period intrusion into the area by Athabascan speakers is presented on the basis of the new archaeological evidence.(22)

Dillehay, Tom D. (Texas-Austin) UPSTAIRS LOOKING DOWN: A GEOGRAPHIC PERSPECTIVE OF INCA ACTIVITY IN THE CHILLON VALLEY, PERU. Recent investigations in the coastal and lower sierra zones of the Chillon Valley have led to a different theoretical approach to understanding the nature of Inca political and economic control of the central coast. Extensive fieldwork has shown that the region was settled unevenly by the Inca; a more intensive state occupation of the lower sierra zone is indicated. The supposition is therefore advanced that state control of the valley was managed from a geographic-political locus in this highland area. Speculation on the nature of the relationship between major sites in the valley is presented within the context of the benefits of such a locus and its apparent influence on the proximate coastal zone.(31)

Dincauze, Dean F. (Massachusetts) LITHIC ANALYSIS IN THE NORTHEAST. Application of lithic analytical techniques has been sporadic in the Northeast, with consequently uneven results. Within the area there has been no standardization of methods or aims, so that results of even the best studies have lacked comparability. Historical and functional reasons for this situation will be briefly examined. Lithic analytical techniques have been applied to problems of culture-unit definition, artifact recognition, and within-site activity descriptions. Attention has been devoted to raw material distribution patterns; there is growing interest in such studies as new techniques appear capable of dealing with the extraordinary diversity of lithic materials in the area. Results to date, major areal problems, and future directions of research activity in the area will be summarized.(42)

Di Peso, Charles C. (Amerind Fdn) PREHISTORIC CASAS GRANDES HYDRAULIC CONTROLS OF THE CASAS GRANDES VALLEY. In the mid-eleventh century, the people of the Casas Grandes Valley of northwest Chihuahua, Mexico, implanted a semi-complex hydraulic system which involved the control of the entire Casas Grandes upland dendritic pattern. This engineering feat permitted the expansion and ultimate exploitation of the indigenous population and its territory by the technologically advanced Mesoamerican puchteca (traders).(22)

Doelle, William (Arizona State Museum) MAXIMIZING SCARCE RESOURCES: A QUANTITATIVE STRATEGY FOR INTERPRETING NON-SITE ARCHAEOLOGICAL MANIFESTATIONS. This paper discusses a practical, quantitative method for carrying out archaeological investigations in areas where artifactual evidence of past human behavior is

not of sufficient density to merit designation as a site. This approach is especially appropriate in dealing with problems relating to past subsistence strategies. It emphasizes collection of quantitative data on vegetation and other environmental variables, while it also assures near 100% recovery of artifactual materials within the area sampled. Discussion focuses on results from a contract project from the Hohokam area of Arizona.(9)

Donahue, J. (see Stuckenrath, R.)(33, 34)

Douglas, John G. (BLM) LATE WOODLAND CEREMONIALISM IN THE WOODFORDIAN NORTHEAST. Symbolism and ritual behavior from the ethnohistorical literature of northeastern North America are examined for their relationship to the physical archaeology of the Late Woodland Collins complex in east-central Illinois. Life and death and the theme of continuity of life are discussed with special attention to cedar, sun, and sun-referenced directional symbolism. Attention is called to the apparently deep cultural roots of the symbolic behavior manifested in a late prehistoric horizon not usually associated in the mind with ceremonialism.(10)

Dragoo, Donald W. (Carnegie Museum) EARLY LITHIC CULTURES OF EASTERN NORTH AMERICA. Research in Eastern North America during the past 20 years has produced a wealth of information on early cultural complexes present in the New World during and after the last Glacial period. The evidence is so extensive that there can be little doubt that the East was a major center of early occupation and subsequent cultural elaboration. The presence of complexes containing a variety of pebble and core tools similar to those of upper Paleolithic manifestations of the Old World indicates the presence of man prior to 30,000 years ago. Conventional Paleo-Indian culture as represented by the Clovis fluted point hunters is present in great quantities at many sites representing the full range of development in time and typology. If the quantity of the remains may be taken as a reliable indicator of population size, the largest concentration of man in the New World prior to 10,000 years ago occurred in the East. From the late Early Lithic complexes of the East there developed several regional traditions adapted to various environmental situations in the Archaic period following the final retreat of the continental ice sheet.(33, 34)

Druss, Mark (Virginia Commonwealth) CHIUCHIU COMPLEX: PHASE SEQUENCE. A 23-phase sequence, based on 8 radiocarbon dates, 21 stratified components, and a 43 feature occurrence seriation, is presented for the Preceramic Chiuchiu complex, ca. 2700-1600 B.C., northern Chile. Elements of the seriation include projection point and boring tool attributes, the latter being sensitive indicators of temporal change. Attributes rather than types were used to avoid the inherent theoretical problems of typing and to maximize the information potential of the collections. The sequence attempts micro-chronological control for the 88 components of the complex. This order of precision is deemed necessary for studies of the settlement and subsistence systems of hunter-gatherers.(39)

DuBois, Robert L. (Oklahoma) RECENT DEVELOPMENTS IN THE ARCHAEOMAGNETIC DATING PROGRAM. Archaeomagnetism uses magnetic measurements made on specimens collected from kilns, hearths, fired floors, and walls from archaeological features as a basis for dating. Eight specimens, each consisting of a 3 cm cylinder of baked clay material encased in an oriented plaster cube, constitute a single sample for age determination. Since the method was developed for the Southwestern United States some ten years ago, the techniques of collecting and processing the samples have undergone a series of modifications. The scope of the present archaeomagnetic program, including the present procedures used in obtaining and processing the samples as well as the criteria used in developing a polar data representational curve for a new region, is discussed. The present results from the Southwest suggest that dates can be obtained for most sites with a precision of from ±10 years to ±30 years at the 95% confidence level. As the magnetic field of the earth is not a simple dipole field, the location of the north virtual geomagnetic pole varies according to the position on the surface of the earth from which data are collected. This feature of the geomagnetic field suggests that separate archaeomagnetic polar data curves will have to be constructed for each major region studied. The length of laboratory time for the development of archaeomagnetic master curves depends on several factors: (1) obtaining numerous archaeomagnetic samples for the delineation of the polar curve; (2) obtaining a series of samples that are firmly cross-dated by other absolute chronological methods, and thereby providing calendrical points of reference along the curve; and (3) obtaining a number of samples from different localities within the region that can be used to cross-check internal consistency. For some regions, data from other areas may be extrapolated and helpful in establishing the general framework for the curves of a new region. The current state of development of the polar data representational curves for the Midcontinent, eastern United States, Mesoamerican and Peruvian areas is discussed. Some of the limitations of the archaeomagnetic dating technique also are discussed, including the effects of secular variation on the earth's magnetic field on the development of the polar data representational curve, as well as the effects of "lightning strikes" or other contaminations on the results obtained from samples. The current solutions to these problems are explained.(44)

Ducos, Pierre (Centre de Recherche d'Ecologie Humaine et de Prehistoire) THE USE OF STATISTICAL METHODS IN THE ANALYSIS OF FAUNAL MATERIAL FROM THE MIDDLE EAST Investigations of the fauna of the Middle East are made largely with the use



of statistical methods. The different working hypotheses, explicit and inexplicit, are discussed, in particular: (1) the non-pertinence of morphological characteristics in the determination of wild and domestic; (2) correlations between quantitative aspects of osteological collections and techniques used by man in the acquisition of animals; and (3) the envisioning of bone assemblages as statistical samples. These three hypotheses justify the utilization of statistical methods. The terms of the application of these methods are also discussed, more for the elaboration of the statistics (reasons for the non-utilization of the number of minimum individual statistic) than for their interpretation: determination of the role of chance or choice, the significant value of the two, the interdependence of the given statistics. Finally, it is discussed which of these methods do not claim to be applied rigidly to the study of collections, but more a point of view according to which the collection is approached. There follows a scientific method which it is necessary to constantly critique and perfect.(24, 25)

Duffield, Lathel F. (Kentucky) MODERN BISON IN THE EASTERN UNITED STATES. Modern bison ranged east of the Mississippi River at least two different times. The first was during the late Pleistocene and the second after A.D. 1550. The second arrival was characterized by a major and rapid range expansion that occurred within a 100 year period. This latest expansion may be related to the onset of the Neo-Boreal Climatic episode (A.D. 1550-1890).(27)

Dumond, Donald E. (Oregon) RECENT RESEARCH IN THE NAKNEK REGION, SOUTHWESTERN ALASKA. In 1973 and 1974 work was resumed by the University of Oregon in order to complete knowledge of the distribution of occupation in the Naknek drainage system. Results suggest that people of Arctic Small Tool tradition were substantially confined to the upper drainage; people of Norton tradition inhabited the upper and middle drainage areas; people of Thule tradition occupied the upper, middle, and lower drainage. Exploratory work at a site on the Bering Sea coast ten miles from the mouth of the Naknek River yielded evidence of a side-notched point complex apparently radiocarbon dated at about 3000 B.C., and an early blade complex securely radiocarbon dated to just after 6000 B.C.(28)

Dunbar, Helene R. (SUNY Binghamton) CHEMICAL AND METALLOGRAPHIC ANALYSIS OF SELECTED COPPER ARTIFACTS FROM THE ENGELBERT SITE. The Engelbert site was discovered in 1967 when a contractor began removing gravel from a knoll in the Susquehanna Valley near Nichols, New York, as part of the construction of the Route 17 Expressway. During two seasons of salvage excavations at this multi-component site, 175 burials and hundreds of pit features were located. Chemical and metallographic analyses of selected copper objects recovered during excavations confirm the presence of two classes of copper artifacts: archaic trade goods forged from native copper, and simple ornaments cut out and forged from early European trade copper that was originally smelted.(44)

Duncan, Kelley C. (Tulsa) LITHIC ASSEMBLAGES AND PREHISTORIC RESOURCES IN CENTRAL OKLAHOMA. The lithic assemblages collected during a survey of the Central Oklahoma Project area are examined. This survey was conducted during July and August 1974 by Archeological Research Associates for the Corps of Engineers. The study area consists of a 170 mile long right-of-way, of which one-third was surveyed. The relationships among tool assemblage types, defined by a classificatory model, and locational types with respect to prehistoric food resources are discussed. Also, brief studies concerning quarry sites and tool manufacturing techniques in Oklahoma are presented.(40)

Durand-Forest, Jacqueline de (Centre National de la Recherche Scientifique France) THE AFFILIATION OF THE CODEX IXTLILXOCHITL. A thorough comparison of the Codex Ixtlilxochitl (Illustrated Calendar) and the related manuscripts (Codex Tudela and Codex Magliabechiano) reveals that the Ixtlilxochitl manuscript is not a mere copy of the Magliabechiano, as has very often been repeated. As a matter of fact, sometimes it seems akin to the Tudela, but occasionally it is different from the other two and presents characteristics of its own. The results of my investigations corroborate Ander's hypothesis, given in the Introduction to the new edition of the Codex Magliabechiano (Graz 1970), for the existence of an older manuscript, from which the three others would derive.(12, 13)

Earle, Timothy K. (UCLA) REDISTRIBUTION: WHAT GOES UP STAYS THERE. This paper discusses the model of redistributional exchange as originally defined by Polanyi and as interpreted by later authors including Service, Sahlins, and Sanders. The main purpose is to show that redistributional networks function to support stratified social structure and not to integrate regionally specialized economic production. Ethnographic literature from the Pacific and Africa is examined. Potential implications for archaeological investigations of economic systems are discussed in detail.(18)

Ebert, James I., and Robert K. Hitchcock (New Mexico) CLAUDE LEVI-STRAUSS AND THE ARCHAEOLOGY OF PREHISTORIC STRUCTURES. Edmund Leach recently suggested that archaeologists are today occupied to their detriment with the pursuit of facile functional explanations, and that their salvation will be the eventual acceptance of a structuralist stance. Is this in fact the case, or have archaeologists been structuralists all along? The basic tenets and products of structuralism are critically compared with those of traditional and new archaeology; it is argued that mysticism and mentalism—which may be very useful to the contemporary ethnologist's purposes—have no place in a true science. (27)

Ebert, James I. (see Hitchcock, Robert K.)(27)

Eddy, Frank W., and Ric Windmiller (Colorado) TWO FORKS: AN ARCHAEOLOGICAL STUDY OF SETTLEMENTS AND LAND USE IN THE COLORADO FOOTHILLS. An archaeological survey of the proposed Two Forks Dam and Reservoir in the eastern foothills of the Colorado Rocky Mountains has revealed a settlement pattern of base camps and limited activity sites that span a period from Early Archaic to historic times. Two models are constructed to account for the nature of these prehistoric settlement and subsistence systems indicating that the location of particular types of sites and land use remained unchanged through time. The first model is based on ethnographic analogy developed from the ethnohistoric accounts of Ute occupation of the Colorado mountains and foothills, while the second model is derived from the plant and animal ecology of the foothills study district. Tests for the assumption of cultural stability through time include functional analyses of stone tool assemblages from each recorded site and comparison of site distributions by time periods and environmental setting.(40)

Edynak, Gloria (Boston) DETERMINING LIFE-STYLES FROM HUMAN SKELETAL MATERIALS: A MEDIEVAL YUGOSLAV EXAMPLE. By means of cluster analyses of functional wear and tear traits of the skeleton, individuals within a medieval Yugoslav pastoral society are clustered into groups which have distinctly different "life-style" patterns. These patterns differ especially between the sexes. The patterns are interpreted in functional anatomical terms and then correlated with the ethnographic data.(29)

Epstein, Jeremiah F. (Texas-Austin) ADAPTATION AS VIEWED FROM NORTHEASTERN MEXICO. Various concepts of adaptation are examined in order to see which is most appropriate for understanding the prehistory of northeastern Mexico. An effort is made to distinguish between environmental exploitation and ecological adaptation, and it is concluded that at this stage of our knowledge the former is most useful.(16)

Ericson, Jonathon E. (UCLA) MODELING EGALITARIAN EXCHANGE SYSTEMS. A set of hypotheses is developed to describe the systemic interrelationships among modes (production, distribution, consumption, etc.) and parameters (population growth, resource distribution, external competition, etc.) of egalitarian exchange systems. These hypotheses are evaluated in terms of the regional exchange systems, described for prehistoric California.(18)

Ericson, Jonathon E., and Rainer Berger (UCLA) NEW RESULTS IN OBSIDIAN HYDRATION DATING RESEARCH. This report will serve as an interim statement on obsidian hydration research underway since 1969 at UCLA. New results will be presented which increase our understanding of the different factors involved in the hydration process. As a result, more complex models are necessary to satisfy the available data. In particular, we examine the variables influencing the rate of hydration for specific obsidian sources and the fact that obsidians from different sources follow individual hydration rates.(21)

Ericson, Jonathon E. (see Findlow, Frank J.)(44)

Ericson, Jonathon E. (see Singer, Clay A.)(3)

Euler, Robert C. (Natl Park Service) THE BLACK MESA ARCHAEOLOGICAL PROJECT. The Black Mesa Archaeological Project, sponsored by Peabody Coal Company, has been conducting survey and excavation on the northern part of Black Mesa, on the Navajo and Hopi Indian Reservations in northern Arizona, each field season since 1967. This research has permitted the development of a conceptual phase system and temporal framework for the Black Mesa Anasazi from Basketmaker II, here dating perhaps as early as 630 B.C., into late Pueblo III, with a primary occupation culminating ca. A.D. 1100-1150. More importantly, with the assistance of geologists from the U.S. Geological Survey, paleo-environmental conditions have been reconstructed and environmental change has been correlated with the phase system and with changes in Anasazi settlement patterns and social organization. These aspects are discussed together with hypotheses regarding the rapid decline in population post-A.D. 1150 and the rise of Tsegi Phase (late Pueblo III) settlement patterns.(37)

Euler, Robert C. (see Ware, John A.)(20)

Evans, Robert K. (Catholic) CRAFT SPECIALIZATION IN THE CHALCOLITHIC OF SOUTHEASTERN EUROPE: TESTS OF HYPOTHESES. In a study of the Chalcolithic period of southeastern Europe, a series of hypotheses has been advanced to account for how and why craft specialization arose. Evans (1973) has already discussed how craft specialization can be demonstrated archaeologically and has presented the explanatory hypotheses. The purpose of this paper is to discuss how specific explanatory propositions can be validated granted the kinds of data available for testing. The basic procedures used by J. N. Hill to test descriptive propositions at Broken K. Pueblo have been followed in this case. Critical test implications were generated for each proposition and the predicted data were used to measure goodness-of-fit.(4)



Fagan, John L. (Corps of Engineers) THE PLATEAU AND NORTHWEST COAST. In the past lithic analysis in the Plateau and Northwest Coast has focused on projectile point typologies which have been used to develop local and regional chronologies. More recently, and through the influence of special schools and classes being offered in prehistoric technology and experimental archaeology, emphasis has been placed on experimentation as a means of studying human behavior as expressed through lithic remains. Included in these studies are such topics as stage analysis in the manufacture of stone tools, replication of specific tool types, wear pattern analysis, examination of quarries and workshops, experimentation with heat treatment, obsidian hydration research, spectographic analysis and trace element studies of raw materials, and studies of trade routes and distribution systems. These focuses of study, coupled with ethnographic information on tool production and use, should further our understanding of prehistoric human behavior in the Northwest.(42)

Fenwick, Jason M., and Michael B. Collins (Kentucky) SOUTHEASTERN UNITED STATES AND TEXAS. Lithic analyses in the southeastern U.S. are concerned primarily with four issues: (1) constructing typologies for describing and categorizing lithic collections; (2) identifying material source areas; (3) identifying heat treated specimens; and (4) inferring functions. Additionally, some students are concerned with various specific technological questions. In Texas, these same concerns prevail, although there seems to be more interest in certain technological questions and there are also attempts to infer reductive strategies.(42)

Ferring, C. Reid (see Hietala, Harold)(35)

Findlow, Frank J., Jonathon E. Ericson, and Suzanne P. De Atley (UCLA) A NEW OBSIDIAN HYDRATION RATE FOR CERTAIN OBSIDIANS IN THE AMERICAN SOUTHWEST. A new hydration rate is presented for the Government Mountain-Sitgreaves Peak obsidian source in Arizona. It is based on an analysis of hydration measurements from a series of independently dated obsidian artifacts from that source. Since obsidian obtained from Government Mountain-Sitgreaves Peak was widely traded in the prehistoric Southwest, the new hydration rate should provide archaeologists working in many parts of the Southwest with a reliable and inexpensive absolute dating technique.(44)

Fish, Paul R. (Museum of Northern Arizona) REPLICATION STUDIES: THE IMPLICATIONS FOR THE STATISTICAL ANALYSIS OF ARTIFACTS. Although considerable concern in the literature has surrounded the nature of archaeological classification, relatively little attention has been paid to the important problem of the quality of data in terms of replicability of observational units. The study presented in this paper involves an examination of discrepancy and error occurring at various levels in lithic and ceramic artifact classification. Standardized typologies, as well as qualitative and quantitative attributes, are considered. The results are discussed in terms of observer bias, influence of training, measurement error, and the implications for the statistical treatment of the data.(27)

Fischer, George R. (Natl Park Service) LEGAL ASPECTS OF UNDERWATER ARCHAEOLOGY. Archaeologists working underwater must deal with legislation, regulations and policies on both federal and state levels, which cover both shipwreck and drowned terrestrial sites. The status of submerged antiquities is governed by additional law and legal principles relating to maritime activities including factors concerning jurisdiction, property ownership, admiralty law, and other legal areas. It is therefore important for the archaeologist working underwater to be familiar with the legal situation relating to underwater sites. This paper outlines and summarizes the pertinent legal factors relating to the field.(38)

Folk, Robert L. (see Valastro, S., Jr.)(44)

Foster, Mary LeCron (California S-Hayward) SYMBOLIC SETS. Symbols may be defined and interpreted structurally on the basis of two kinds of spatial information: sequential and concurrent. The first is available to ethnography but not archaeology, the second to both disciplines. Worldwide distribution of symbolic sets with similar spatial characteristics and a deeply affective ritual function of assuring or restoring individual health or community wellbeing suggest the possibility that an archaeological knowledge of concurrency may permit implicational inferences about ritual sequencing and function.(10)

Fowler, Catherine S. (Nevada) ETHNOGRAPHIC ANALOGY AND GREAT BASIN PREHISTORY. Models of prehistoric Great Basin socio-cultural development have drawn heavily on ethnographic and ethnohistoric data, either directly or by implication, e.g. the Desert Culture and Lacustrine Adaptation models. Problems of using ethnographic/ethnohistoric analogs in the formulation of models of Great Basin prehistoric lifeways are reviewed and discussed.(5)

Fowler, Don D. (Desert Research Inst) MODELS OF GREAT BASIN PREHISTORY: AN OVERVIEW. Models of Great Basin Prehistory have been based on data and interpretations derived from archaeology, linguistics, ethnography, physical anthropology/demography, and paleoecological/climatic sources. A historical review of previous models is presented as background to topical papers on interdisciplinary interrelations to be presented in the symposium.(5)

Fowler, P. J.(32)

Fox, John W. (SUNY Albany) PROTOHISTORIC HIGHLAND MAYA ACROPOLIS SITES. A number of Protohistoric sites along the Rios Negro and Motagua in the Guatemalan highlands display architectural and settlement pattern features common to the northern Gulf lowlands (e.g., Mayapan, Chichen Itza). Archaeological correspondences are correlated with ethnohistoric references, which also point to the Gulf coast lowlands as a point of origin for the Protohistoric highland Maya rulers.(43)

Freeman, Leslie G. (Chicago) CUEVA MORIN AND THE PALEOLITHIC OF NORTHERN SPAIN. International excavations at Cueva Morin (Santander, Spain) were undertaken primarily (1) to evaluate the correlates of interassemblage and interfacies difference in the local Mousterian, (2) to define the regional transition from Middle to Upper Paleolithic industrial complexes, and (3) to permit definition of relationships between local Aurignacian and Perigordian variants. Nine Mousterian or probably Mousterian horizons were recovered, representing at least two major facies. One level contained a structure and chipped bone implements. The site yielded the first in situ Chatelperronian horizon in Spain, and a long archaic Aurignacian sequence with structures and burials topped by Solutrean, Magdalenian, and Azilian horizons.(8)

Friedman, Irving (U.S. Geological Survey) OBSIDIAN HYDRATION DATING: EXPERIMENTAL RATES. The rate of hydration in obsidians of different chemistry has been determined as function of temperature and chemical composition. Application of these experimental data to particular problems in obsidian hydration dating in archaeology is discussed.(21)

Friedman, Janet L. (Neah Bay Field Lab) ABORIGINAL WOOD USE ON THE NORTHWEST COAST: EVIDENCE FROM THE OZETTE SITE, WASHINGTON. At the Ozette Archaeological site on the northwestern Washington coast, more than 30,000 artifacts, most of which are made from wood, have been recovered from houses buried by a mudslide. Because of the remarkable preservation situation, artifacts of wood, generally considered the major technological component of Northwest Coast culture, can be studied in an archaeological context. The current study deals with the identification of the wood species utilized in the manufacture of specific categories of wooden artifacts by these aboriginal people. Evidence indicates that they selectively utilized a wide range of available woods, choosing the species with mechanical properties best suited to the needs posed by a particular type of artifact. They were well aware of the potential of their environment, and utilized it knowledgeably.(28)

Frison, George (Wyoming) THE COLBY SITE: A MAMMOTH PROCUREMENT SITE IN NORTHERN WYOMING. Although mammoth remains are widespread on the Northwestern Plains, actual kill sites are rare. The Colby site near Worland, Wyoming, is an unquestionable kill site that has produced three immature mammoths with projectile points that vaguely resemble Clovis and a bone date of 11,200±220 years B.P. Other faunal remains including Bison, Antilocapra, and Lepus have also appeared. Geological evidence suggests a much different topography than at the present time.(33, 34)

Fritz, John M. (California-Santa Cruz) A REACTIONARY SPEAKS OUT ON VALIDATION IN ARCHAEOLOGY. This paper takes a reactionary approach to arguments on the logic of validation in archaeology. Archaeologists borrow philosophical positions at their peril since they generally do not know anything substantive about what they are borrowing. Since we have hardly coped with problems of sampling error, proofs based on biased samples of data will hardly be compelling. Similarly, archaeologists ought to worry about producing some legitimate processual explanations before they become too exercised about rejecting them.(4)

Frost, Janet O. (Eastern New Mexico) PREHISTORY IN AMERICAN SAMOA. Recent archaeological investigations in American Samoa (Tutuila) have provided data on early settlements for West Polynesia. Excavations at an old village site produced a single C-14 date of 610 B.C. associated with unusual stone tools and a burial. This date is now the earliest for occupation in Samoa. Pottery, a common marker of West Polynesian early period, was not found. Two fortified ridge sites were also mapped and tested providing two dates to suggest a fortification period by A.D. 1140. Brief excavations were undertaken in two late period sites containing European material. A large complex of the enigmatic "star mounds" were studied.(28)

Fry, Gary F. (Youngstown) HUMAN COPROLITES FROM FRIGHTFUL CAVE. Thirty-two coprolites (fecal specimens) from Frightful Cave, Coahuila, Mexico (CM 68) have been analyzed for diet and parasites. Samples are divided into three stratigraphic/temporal units: 7000 B.C.-5000 B.C. (12 specimens); 5000 B.C.-2000 B.C. (10 specimens); 2000 B.C.-A.D. 300 (10 specimens). Adaptation to Broad Spectrum Resource Utilization is demonstrated by the eating of 37 varieties of seeds, 9 non-seed plant varieties, insects, reptiles, birds and eggs, and mammals including bones. Typical Desert Archaic food preparation techniques were practiced: parching and milling of small seeds, preparation of cacti by burning off spines; roasting of roots, tubers and cactus pads; preparation of bone meal or cakes by pounding or milling. Culture change is indicated by an expansion of the food base after 2000 B.C. A possible climatic trend from more mesic to more xeric conditions from bottom to top is also indicated. Microscopic search for parasites and ova was negative.(16)



Furst, Peter T. (SUNY Albany) IN SEARCH OF MEANING IN PRE-COLUMBIAN ART. The paper deals with results that might be obtained in analyzing various major themes in Pre-Columbian art—e.g., skeletonization, were jaguar, cruciforms, conch shells, toad, horns, left-right dichotomy, etc.—through the use of ethnographic and ethnohistoric data, even where no direct historical connection can be securely established between the archaeological material and the indigenous population now inhabiting the area where it was found. Also discussed is the current "cult of economic determinism" or materialist strategy in relation to prehispanic art.(10)

Galarza, Joaquin (Musee de l'Homme, Paris) EUROPEAN HERALDRY AND NATIVE MANUSCRIPTS(12, 13)

Gall, P. L., and Arthur A. Saxe (Ohio) ECONOMIC AND MORTUARY PRACTICES. Attempts to discover systemic relationships between socio-cultural behavior and mortuary behavior are often handicapped by the inadequacy of the ethnographic data. Ethnographers interested in social relations have tended to slight material artifacts and vice-versa. The Temuan, an agricultural group in Melasia, is currently undergoing detailed study. The relation between economics and mortuary practices, precolonial and contemporary, are explored.(18)

Gall, P. L. (see Saxe, Arthur A.)(18)

Galm, Jerry R. (Washington S)(3)

Gasser, Robert E. (Arizona S) and Frank E. Bayham (Arizona) THE FLORES SITE: A SPATIAL/FUNCTIONAL ANALYSIS. By collecting a large sherd and lithic scatter using one-meter diameters, functional interrelationships among artifact types can be determined and inferences made about past human behavior. Lithic tool distributions were analyzed statistically using a modified form of nearest neighbor analysis; differences among type distributions were tested for significance using chi-squared tests and Jacard's Coefficient. Data pertain to a probable Hohokam processing site near the Verde River, Maricopa County, south-central Arizona.(35)

Gerald, Rex E. (Texas-El Paso) DROUGHT-CORRELATED CHANGES IN TWO PREHISTORIC PUEBLO COMMUNITIES IN SOUTHEASTERN ARIZONA. Droughts lasting two or more years frequently lead to famine among horticulturalists of tribal level societies. Under the stress of decreasing nutrition, human behavior shifts from the normal altruistic patterns toward egocentric ones. As a result, several changes in the social system are predictable: Competition for food resources will reduce the friendly social contacts between communities; competition for food resources between households within the community will bring about a reduction in social interaction; household size will be reduced because of the premature deaths of the elderly and the young; stored foodstuffs will be conserved more diligently; wild foods will be utilized more intensively; and non-subsistence activities will be minimized. These changes were postulated and deduced hypotheses tested utilizing data from two small, sequentially occupied Salado sites in southeastern Arizona. The Davis Ranch site was colonized by a group of virilocally resident males and their families during a relatively moist period in the latter part of the thirteenth century. As the environment began to desiccate, the site was fortified with a perimeter wall and was later abandoned in favor of the nearby, more readily defended, Reeve Ruin location where the perimeter defensive wall was constructed before the protected dwellings were completed. If it is assumed that wall construction techniques furnish evidence of male activity patterns and that ceramic design element types relate to female behavior, it is possible to explain data recovered at Reeve Ruin by hypothesizing that the site was occupied by a lineage of males practicing avunculocal residence and intermarrying relatively regularly with two nearby communities in a pattern consistent with patrilateral cross-cousin marriage. Avunculocally resident lineage males would be well suited to the defense of field plots and food stores from neighboring groups made covetous in an environment of drought-reduced carrying capacity. Under different assumptions most of the Reeve Ruin data can also be explained by the assumption of endogamy and either matrilocal or patrilocal residence with bilateral cross-cousin marriage, but the low population density that usually accompanies this marriage practice is not indicated.(20)

Gilbert, B. Miles (Missouri) ZOOARCHAEOLOGY OF THE TOLTECS AT TULA, HIDALGO. Some aspects of Toltec animal procurement, use and protein diet are discussed as revealed from data collected by the University of Missouri-Columbia.(27)

Gladfelter, Bruce G. (Illinois), John J. Wymer, and Ronald Singer (Chicago) THE CONTEXTS OF THE CLACTONIAN AT CLACTON AND ACHEULIAN INDUSTRIES AT HOXNE, ENGLAND. Excavation of a Clactonian industry at the type locality near Clacton-on-Sea, Essex, has produced more than 1200 artifacts, more than half of which are underived. The geologic context and faunal assemblage indicate a riverine setting in an open woodland habitat; the pollen assemblage from the marl layer suggests a Hoxnian age (Hol) for the industry. At Hoxne, Suffolk, two stratigraphically distinct Acheulian industries, in part in situ, have been excavated in interglacial lake muds and in an overlying, largely fluviatile, Upper Sequence, with indications of climatic deterioration.(8)

Gluckman, Stephen J. (North Carolina Archives & History) UNDERWATER ARCHAEOLOGY SINCE GOGGIN. This paper attempts to assess the developments in North American underwater archaeology in the last decade. The baseline from which the assessment is drawn are the several professional publications on the topic which appeared in the late 1950s and early 1960s. The paper concludes with an evaluation of the present concerns of the people doing archaeology underwater.(38)

Goldstein, Lynne (Northwestern) SPATIAL ORGANIZATION IN MORTUARY ANALYSIS: MISSISSIPPIAN CEMETERY EXAMPLES. Examination of prehistoric social organization by means of mortuary site analysis has become extremely popular in the last few years. Most of these analyses dwell on the differential distribution of artifacts among burials, or other obvious indicators of social position. This study employs traditional indicators of social status, but focuses on the spatial organization of these indicators and of the burials themselves in mortuary sites. By examining spatial relationships among and between burials, the interrelation of individuals within the group can be more fully understood. Moss and Schild cemeteries, two Mississippian sites in the lower Illinois Valley, are used as examples.(29)

Goodyear, Albert C. (South Carolina) CONTRACT ARCHAEOLOGY WITHIN THE HIGHWAY CONTEXT: AN EXAMPLE FROM SOUTH CAROLINA. The general problem of contract archaeology making meaningful contributions to wider American archaeology in areas of method and theory are reviewed and the case of highway contract archaeology as approached in South Carolina is described. The need for written, explicit research designs are discussed particularly in light of "small-scale" contract areas. A consideration of contract archaeology within highway corridors is offered which treats the primary limitation, that of transect sampling which substantially nullifies a true regional analysis; additionally considered are the good points of problem-oriented highway work which include culture-ecological analysis, geographically extensive investigations, a de facto multi-stage research strategy, certain potential theoretical and methodological contributions, and its greatest strength that of intensive intra-site analysis. The need and functions of a general design for the highway program are discussed which will provide data comparability and reliability for long-range research strategies. The primary goal of the South Carolina highway research design, that of systematic exploration and reconstruction of extinct behaviors represented by highway intercepted sites, is reviewed. Sampling procedures and data types are considered in view of their relevancy to this primary theoretical goal. Several domains or targets for data recovery are offered which can be expected to aid in the achievement of behavioral reconstructions for a variety of "site-types" of all phases in prehistory of the state.(9)

Gorman, Frederick J. (Boston) THE ROLE OF INFORMATION THEORY IN EXPANDING ARCHAEOLOGICAL INQUIRY. The logical status of current information-theoretic analyses of prehistoric cultural systems having unknown (black box) organization is discussed. Two of the more apparent consequences which the theory of uncertainty and the identity preservation of information bits have for expanding research are examined. Does an uncertainty limit theorem exist which bounds articulation of information bearing elements of hypothesis, data collection and analysis in a research design? Does the stable identity of information permit construction of a relativity theorem to account for changing relations between permanent and temporary linear culture system behaviors in a chronology of archaeological cultures?(23)

Goss, James A. (Washington S) LINGUISTIC TOOLS FOR THE GREAT BASIN HISTORIAN. Synchronic and diachronic Great Basin linguistic models are surveyed and evaluated as tools for the prehistorian. Both linguists and archaeologists have often become so enamored of their data and methods that they have lost sight of each other and of their common ethnological objective. Both are ethnologists contributing toward a synchronic and diachronic theory of Great Basin culture.(5)

Grady, Mark (Arizona State Museum) ARCHAEOLOGICAL SURVEY AND THE FUTURE OF CULTURAL RESOURCE MANAGEMENT. Evaluation of current political and economic trends reinforces the position that effective procedures for implementation of contract archaeological research require input at the alternative planning stages of land modification projects. Faced with funding cut-backs, sponsors are becoming increasingly aware of the fact that resource management programs are more economical than salvage approaches. Archaeological management data provided during terrain alteration planning reduce the costly expense of mitigation. Most of these data are obtained through archaeological survey. Techniques for the maximization of survey information potential relating to research requirements and sponsor needs are considered.(9)

Graybill, Donald A. (Georgia) REALITY AND COMPARABILITY IN THE USE OF CARTOGRAPHIC-HYDROLOGIC VARIABLES IN ARCHAEOLOGICAL RESEARCH. The theoretical justification and utility of systems of stream ordering for comparative archaeological studies of cultural-environmental interaction is examined from several perspectives. Cartographic variability and problems with applying some hydrologic ordering systems leads to the consideration and development of new alternatives.(14)



Grayson, Donald K. (BLM) PALEOENVIRONMENTAL IMPLICATIONS OF THE VERTEBRATE FAUNA FROM THE DIRTY SHAME ROCKSHELTER. Approximately 3000 bones and bone fragments, representing some 25 species of mammals, birds, and fish, have been identified from the Dirty Shame Rockshelter to date. Of these identified elements, the great majority—over 95%—are mammalian, the bulk of these pertaining to two species, Sylvilagus nuttallii (Nuttall's Cottontail) and Marmota flaviventris (Yellow-bellied Marmot). The pattern of distribution of these remains across the six stratigraphic zones of Dirty Shame allows insight into the general nature of past environments in the immediate area of the site, and indicates that the upper Owyhee drainage during the middle Holocene could not have been particularly hot and dry. A review of published studies which provide information on Holocene climates in the northern Great Basin and adjacent areas indicates that no general sequence of Holocene climatic changes can as yet be confirmed for this large region, and that properly cross-verified climatic sequences for smaller areas within the northern Great Basin proper are lacking. A program of archaeological research which would provide such a sequence is suggested and briefly outlined.(17)

Greber, N'omi (Case Western Reserve) INDICATIONS OF SOCIAL ORGANIZATION DERIVED FROM OHIO HOPEWELL MOUNDS. Field data from classic Hopewell sites, largely mounds and earthworks of the central Ohio Valley are re-evaluated. A framework for viewing these data as representing a section of a total culture is given. Both metric and nonmetric variables based on the spatial distribution and other attributes of the individual burials are transformed to a system of rankings of individuals. Possible social organization which could result in such rankings are discussed. Suggested intersite relationships are discussed as well as relationships with other Middle Woodland Hopewell sites.(45)

Green, Dee F. (U.S. Forest Service) THE WILDERNESS AND CULTURAL VALUES: INTRODUCTION. In 1973 the Forest Service published a list of 12,289,000 acres in some 274 areas which are to be studied for possible Wilderness classification. Many of these areas contain important cultural resources as do already established Wilderness areas. This paper explores some of the implications of wilderness for cultural values and asks a number of questions which need resolving vis. the management of cultural values in Wilderness.(26)

Green, James P. (Washington S) THE GREAT BASIN AND CALIFORNIA. Great Basin lithic studies have developed in association with culture-historical reconstruction. Cultural chronologies based on projectile point typologies have traditionally overshadowed other avenues of lithic research. The emphasis on projectile points as fossiles directeurs has inhibited analysis and definition of related lithic assemblages. Analytical studies have been directed toward verifying formal types; however, the technological parameter has only recently been considered. Core and biface reduction systems together with manufacturing sequences are growing areas of investigation. Functional and wear pattern studies are few but are potential sources of much information. Elemental analysis of obsidian has produced data on source variation and sampling. Libraries of source areas and composition are aiding in the fingerprinting of site material. Research in this area is contributing to the elucidation of trade networks and regional settlement systems. Obsidian hydration studies linked with elemental analysis, and solid chronologies are becoming more productive. Lithic research is in its infancy in the Great Basin. Collections are present from many areas of the region which could serve as lithic corpora. Lithic technology is an important tool in understanding prehistoric cultural developments in the Great Basin.(42)

Greene, Lorraine H. (Northeast Louisiana) INDIAN POPULATIONS IN SOUTHWESTERN COAHUILA, MEXICO, DURING HISTORIC TIMES. William B. Griffen (1969) published a study of Spanish documents that describes the events and inhabitants in Southwestern Coahuila, Mexico from the late sixteenth through eighteenth centuries. Several archaeological reports concern the prehistory of the region, particularly Taylor (1966), Varner (1967), and Heartfield (1975). With these basic data and additional supporting materials, a model of Indian settlement and utilization of the Laguna Mayran and its environs is presented. This model is used to formulate hypotheses about Proto-historic times, define archaeological problems and formulate research objectives. Particular emphasis is placed on correlation of ethnographic and archaeological data and the nature and origin of historic aboriginal populations in Southwest Coahuila.(16)

Greengo, Robert E. (Washington) PREHISTORIC ARCHITECTURE IN NORTHEASTERN GUERRERO. Most of the recorded sites in the region of the upper Rio Tepecoacuilco have architectural remains which tend to be primarily located on low hills and uplands. Construction was largely of unhewn stone, both dry-laid and with adobe mortar. Dressed stone included squared blocks, cylindrical columns, and rather unique conical pieces. Painted lime plaster is evident in some floors and walls. Relationships of units within and between sites is discussed in terms of density and site plan as they vary through time. Although the Mesoamerican structure-plaza arrangement is well represented, rectangular, pyramidal substructures are infrequent and may have been quite late in the region.(43)

Griffin, James B., and Stephen Williams, CHRONOLOGY (7)

Gumerman, George J. (Southern Illinois-Carbondale) THE CENTRAL ARIZONA ECOTONE PROJECT. The four-year-long Central Arizona Ecotone Project has focused on the cultural and natural boundary situations in an area 20 miles north of Phoenix. The

Hohokam-like manifestations in the Lower Sonoram environmental zone of the test area and the Pueblo-like groups in the Upper Sonoram zone provide an understanding of the variety of adaptive strategies to the sets of natural and cultural systems. Emphasis is on the understanding of the cultural boundary mechanisms and the development and maintenance of sub-cultural systems.(37)

Gumerman, George J. (see Hanson, John A.)(44)

Gunn, J. D. (see Stuckenrath, R.)(33, 34)

Gunn, Joel, and William Korth (Pittsburgh) KNAPPER VARIANCE: PHYSICAL AND PSYCHOLOGICAL DIMENSIONS OF VARIABILITY IN FLINT WORKING. Previous experiments with a group of flint knappers have shown that individuals can be distinguished by their characteristic knapping idiosyncracies. The project described in this paper undertakes a refinement of idiosyncratic style analysis, namely the determination of how much variability can be expected if an individual is attempting to reproduce a given type of tool. Incorporated into the study is an explicit attempt to determine salient psychological-cognitive variables inherent in the knapping process, or in other words, the elements of idial style. This effort is informed by a quality control model suggested in previous papers which was to date untested.(3)

Hackenberger, Steven (Tulsa) A WILDLIFE CONSERVATION MODEL FOR ARCHAEOLOGICAL CONSERVATION. Archaeological research is based on a nonrenewable resource, one which is being very rapidly destroyed. Resource management programs which focus on the conservation of our archaeological resources must be developed. The programs and accomplishments of other conservation oriented groups may provide models for archaeological conservation. One wildlife conservation program in particular, "Acres for Wildlife," seems applicable. This paper examines "Acres for Wildlife" as one possible model upon which a program of resource management for archaeology might be based.(26)

Hall, H. J. (Chicago) PALEOSCATOLOGY AT DIRTY SHAME ROCKSHELTER. Some 15 human coprolites from the excavation of Dirty Shame Rockshelter in southeastern Oregon were analyzed for data pertaining to past diet and disease. Evidence to date suggests that the denizens of this site ate freshwater crayfish, a significant amount of meat (probably rabbit and other small game), as well as several varieties of seed. No evidence of parasitic disease has been demonstrated.(17)

Hall, Robert, and James Price, PROCESS (7)

Hall, Robert L. (Illinois-Chicago Circle) STRUCTURE AND CONTINUITY IN PREHISTORY. This paper examines cultural continuities through prehistory on two levels: (1) continuity of culture content which may be traced and often even seriated through a succession of genetically related forms or styles; and (2) continuities of a generative nature which express themselves through time or space in material remains not always relatable in form or style. Study of the latter continuities may reveal a structure in prehistory concealed by seemingly random variation of culture content.(10)

Hally, David J., and Wyman W. Trotti (Georgia) THE SETTLEMENT PLAN OF THE KING SITE, AN EARLY HISTORIC INDIAN TOWN IN NORTHWEST GEORGIA. Recent excavations at the King site in northwest Georgia have exposed approximately two-thirds of a four-and-a-half acre Indian town dating to the sixteenth or early seventeenth century. General site plan consists of a defensive ditch and palisade, an inner habitation zone, and a central plaza with associated public buildings. These major elements of the site plan are described and compared with ethnohistorical settlement data from the Southeast.(45)

Hammond, Norman (Cambridge) THE MAYA JADE TRADE: SOURCE LOCATIONS AND ANALYSES AND ARTIFACT ATTRIBUTIONS. This paper discusses the sort of processual problems which can be approached by studying the manufacturing and distribution patterns of an explicitly used luxury product, contrasted with obsidian and chert. The results of both X-ray fluorescence and neutron activation analyses of newly located jade sources and as yet unpublished Preclassic jade heads are discussed in terms of the internal chemical homogeneity and external physical distinctiveness of each jade source and analyzed artifact.(18)

Hanes, Richard C. (Oregon) LITHIC TYPOLOGY AND DISTRIBUTIONS. A description of the Dirty Shame chipped stone tool assemblage and results of the statistical analysis is presented. The chipped stone items include projectile points, blades, choppers, crude bifaces and unifaces, scrapers, utilized flakes, and drills. The analysis is designed to provide information for deriving the implications of this upland-adapted site for Great Basin prehistory. Three cumulative stages of analysis were followed: (1) identification of the tool assemblage based on the content of each stratigraphic zone; (2) establishment of quantitative relationships between the assemblages for determining significant trends in tool type usage; and (3) correlation of the Dirty Shame assemblage pattern to comparable Great Basin data representing lakeshore-adapted sites.(17)



Hanson, Glen T. (Arizona S) SHARED-TOOLS OR SHARED-AREA: AN ALTERNATIVE APPROACH TO THE ANALYSIS OF SPATIAL ASSOCIATIONS. In a recent paper Whallon (American Antiquity 39:14-35) has presented a method for the analysis of spatial association between artifact types which is based on the percentage of area shared by intersecting tool clusters. This method yields comparative values which are evaluated against all other pairs of tool types and from which spatial associations are discerned. This paper offers an alternative approach which statistically compares the number of tools which occur within intersecting tool clusters and those which occur outside of the intersection. This method measures association by incorporating Chi Square, Pearson's Contingency Coefficient, and Jacard's Coefficient of Similarity in the analysis of a resulting contingency table. An advantage of this method is that it measures the association between objects rather than the space associated with the objects. Both methods are utilized in the analysis of tool distributions at the Brand site, a Dalton campsite in northeast Arkansas. The results of this study suggest that the shared-tool method provides a more sensitive estimation of spatial association which may be applied in testing hypotheses concerned with spatial variability.(41)

Hanson, John A., George J. Gumerman, and Carol S. Weed (Southern Illinois-Carbondale) ARCHAEOLOGY AT A DISTANCE: APPLICATIONS OF NASA'S SKYLAB IMAGERY. Skylab imagery and high altitude photography were tested for solving some of the problems involving settlement archaeology in central Arizona. Geology, hydrology, and biology related interpretations of NASA supplied Skylab imagery define relationships between prehistoric land management systems, present vegetational communities, and hydrological networks. The value of ultra high altitude imagery interpretation to archaeological problem defining and solving is discussed.(44)

Hardin, Margaret Ann (Loyola) SOCIAL, STYLISTIC, AND TECHNOLOGICAL FACTORS UNDERLYING UNGRAMMATICALITY IN IFUGAO LIME TUBES. This paper is based upon a set of about 40 Ifugao lime tubes from the collections of the Field Museum of Natural History. Examination of the decorations on these containers showed that about 80% have incomplete or ill-formed decoration. Further, a large number show evidence of the work of more than one artisan. Consideration is given to the kinds of social and cultural factors that might be expected to produce this patterning. The roles of subtractive manufacture and logically subtractive design structures in enhancing this kind of patterning are considered. This case suggests new strategies for the inference of patterns in human behavior from stylistic variation in material culture.(10)

Hare, Edgar P. (Carnegie Inst) AMINO ACID DATING OF BONES, SHELLS, AND TEETH. The proteins in calcified materials are relatively easily hydrolyzed to smaller peptides in free amino acids. Even young specimens (approximately 100 years old) show significantly increased proportions of free amino acids when compared to fresh materials. An analysis of the amino acid composition and the extent of the racemization of the amino acids as well as a measurement of the extent of hydrolysis of the protein in fossil bones, shells, and teeth should make it possible to deduce the age, temperature history, and leaching history of most calcified fossil materials.(21)

Hare, E. P. (see Von Endt, D. W.)(44)

Harlan, Mark E. (New Mexico), and Jeffrey Neff (Arizona) DATA MANAGEMENT IN ARCHAEOLOGY: CONSIDERATIONS FOR OPERATIONALIZATION. This paper details the problems being encountered as a result of the need for increasingly detailed analysis of greater and greater amounts of archaeological data. The problems of both excavators and curators are considered. The system of data management designed to assist the investigators on the National Park Service's Antelope House Project is offered as an example of data management for an ongoing research project. The efforts at computerized data management by the Arizona State Museum provide an example from a curatorial setting. Emphasis is on practical solutions to ongoing problems.(14)

Harris, J. W. K. (California-Berkeley) THE KARARI INDUSTRY, A PRELIMINARY REPORT OF A NEW LOWER PLEISTOCENE INDUSTRY, FROM RECENT INVESTIGATIONS CARRIED OUT AT EAST LAKE RUDOLF, KENYA (1972-74). This paper is a preliminary report on survey and site excavations carried out in exposures of the Upper Member of the Koobi Fora Formation and in the Ileret Member (1.5 million years), East Lake Rudolf. The analysis and classification of lithic remains from a complex of 14 archaeological sites reveal distinctive features that do not readily conform to other known assemblages from archaeological sites in the Lower Pleistocene (Oldowan, Developed Oldowan, Early Acheulian). A series of heavy duty (core) scraper and light duty scraper specimens form a distinctive set within the tool category. Early Acheulian-like handaxes and cleavers have been recovered in small numbers on the surface during the course of the survey, but these forms are almost totally absent from the excavated sites. The strategy in the excavation program of the Karari sites has been to sample traces of hominid activities in known variable sedimentary localities. Geological and microstratigraphical studies demonstrate the archaeological sites were located in or near channels and in river floodplain contexts. One is able to discuss the evidence of the known distribution of sites and surface scatters of stone and bone specimens in relationship to the paleogeography in an attempt to discern patterns in hominid behavior.(36)

Harrison, Peter D. (Trent) INTENSIVE AGRICULTURE IN SOUTHERN QUINTANA ROO, MEXICO: SOME NEW LINES OF EVIDENCE AND IMPLICATIONS FOR MAYA PREHISTORY. Studies recently published by Siemens and Puleston on work with "ridged fields" in Belize and by Turner on terraces and "raised fields" in southeastern Campeche and adjacent portions of Quintana Roo have shown the growing awareness of evidence for agricultural intensification realized by the ancient Maya. A site survey conducted through the Royal Ontario Museum over the past three years in southern Quintana Roo has yielded additional evidence relevant to these studies. The large number of sites located by the survey are distributed in a pattern which shows close association with the littorals of modern-day "bajos," areas of poorly-drained ground which annually become seasonal swamps. Aerial photographs of these bajos clearly show a gridded pattern of differential vegetation which surely reflects the locations of raised fields in the bajos. The area covered by these patterns further indicates a scale of intensive agriculture previously unsuspected. A new model of Maya prehistory is generated on the basis of the implications arising from this information.(43)

Hassall, T. G.(32)

Haury, Emil W. (see Haynes, C. Vance)(33, 34)

Haynes, C. Vance (Arizona), L. D. Agenbroad (Chadron), and Emil W. Haury (Arizona) NEW DATA FROM THE LEHNER CLOVIS SITE. In light of the data gained from the Murray Springs Clovis site excavations of 1966-70, we returned to the Lehner Clovis site in 1974 to test for activity areas adjacent to the kill area excavated in 1954-55 by Haury and others. Buried butchering and roasting areas were found along the south bank of ancient Mammoth Kill Creek and contained scattered flake tools, edge sharpening and retouch flakes, and split bones of camel (Camelops sp.) as well as bison (Antiquus sp.). Bones of mammoths Nos. 10 and 11 occurred in the channel sands of the ancient creek, and bones of No. 12 occurred around a shallow roasting pit where charred and calcined bone fragments of bison, bear (Ursus Americus), and a small artiodactyl were concentrated. In addition, bones of a muskrat (Ondatra Zibethica), rabbit (Leporida), and garter snake (Thamnophis cyrtopsis) were found on the Clovis occupation floor. A new pre-Clovis age alluvial unit was recognized and mapped. Otherwise, the stratigraphic knowledge is the same as reported previously with the important exception that significant but scanty evidence was found within the "black mat" (Unit k of Antevs and $F_2$ of Haynes) of a post-Clovis Cochise-like occupation. Replicate radiocarbon dating suggest a slightly younger age for the Clovis occupation than heretofore determined.(33, 34)

Hecker, Howard M. (Columbia) DOMESTICATION RECONSIDERED: ITS IMPLICATIONS FOR FAUNAL ANALYSIS. As faunal analysts, we are frequently asked to ascertain whether or not a prehistoric population practiced animal domestication. With this objective in mind, I applied standard faunal analysis techniques to a collection of over 15,000 bones from Beidha, Jordan (7000-6500 B.C.). The results of my analysis were ambiguous, with evidence both for and against domestication depending on the various criteria and definitions used. In the course of trying to deal with such ambiguity, it became increasingly clear that the problem lay not with the data itself, but rather with the conceptualization of the problem. Hence a reformulation was necessary which would call attention to the cultural and the processual aspects of this human-animal relationship without being restricted to the conceptually awkward term of "domestication." In this light we devised the new term "cultural manipulation" which allows us the freedom to consider a whole array of different types of human-animal relationships without being restricted by arbitrary, preconceived categories.(24, 25)

Heilman, J. M. (Dayton Museum of Natural History) CERAMICS AND SPATIAL PATTERNING AT THE INCINERATOR SITE—(33 My 57). Incinerator site, an Anderson Focus-Fort Ancient village, is located on the flood plain of the Great Miami River in Dayton, Ohio. Analysis of the ceramic assemblage at this site has documented a two stage process for the building of the larger vessels. Also, the spatial distribution of the ceramics has reinforced the idea that each household controlled the use of the area between the plaza and their house. New houses excavated during the last summer suggest that the houses may be grouped in distinct clusterings.(45)

Helfman, Pat (see Bada, Jeffrey L.)(21)

Hellmuth, Nicholas M. (Fdn for Latin American Anthropological Research). PRE-COLUMBIAN BALL GAME OF THE GUATEMALA MAYA. Archaeologists often equate the rubber ball game of the Classic Maya with ritual decapitation, since this bloody sacrifice is shown so often at Chichen Itza, El Tajin, Cotzumalhuapa (Bilbao), and elsewhere. Three Tepeu 1 or 2 Classic Maya vases from El Peten and Belize each show a ball court, athletes actually playing the game, and a large rubber ball in volley. Long hieroglyphic inscriptions describe the sport. These three remarkable miniature murals reveal facts about the Maya version of the game showing that it differed significantly from the Toltec-Veracruz-Bilbao version. Using the three new ball game vases and illustrations of related, contemporaneous ball game sculpture from Copan, Seibal, Chinkultic, Cancuen, Lubaantun, Uxul, Ichmul, Itzan, and a previously unpublished Tikal scene which shows the whole court, four players, the ball in play, and a spectator, this presentation will offer a full description of the Pre-Columbian rubber ball game of the Classic Maya.(43)



Henn, Winfield (Oregon) CURRENT RESEARCH IN THE UGASHIK RIVER DRAINAGE, ALASKA PENINSULA. The first summer of research in the Ugashik River drainage of the Alaska Peninsula was completed by the University of Oregon during 1974, as part of an ongoing program focused on the origin and development of Norton peoples in southwest Alaska. Preliminary analyses suggest four, possibly five, prehistoric components. They are from earliest to latest: a component with wedge-shaped microblade cores, numerous microblades, burins, and other tools (5725 B.C.±260); an assemblage with large side notched points, core and flake bifaces and other artifacts; a Norton tradition occupation; a Thule component, and possibly an Arctic Small Tool occupation.(28)

Hennen, Gary W. (Rutgers) A PALEO-ECOLOGICAL LOCATIONAL ANALYSIS OF THE LOWER SCIOTO REGION OF OHIO, PART I: DEMOGRAPHIC ANALYSIS. This paper introduces the concentric circle method of demographic analysis which is grounded in calculus theory and was devised by the author to demonstrate differential site distributions and locational preferences by different cultures using the same area. The most significant conclusions based upon this approach include: (1) demonstrating that site clustering increased progressively through Early, Middle, and Late Woodland periods despite evidence of population reduction and cultural simplification during the Late Woodland period; (2) demonstrating a difference in distribution pattern between Hopewellian ceremonial sites and occupational sites implying a hamlet-field-hamlet arrangement; (3) demonstrating that Hopewellian occupation site distribution very much resembles Late Woodland occupational site distribution.(45)

Hester, James J. (Acting Colorado State Archaeologist) ARCHAEOLOGY AND THE COLORADO LAND USE BILL. Colorado H.B. 1041, passed in 1974, specifies the following: "The protection of the utility, value, and future of all lands within the state, including the public domain as well as privately owned land, is a matter of the public interest. ¶ Local governments have the duty to identify, designate, and administer such areas and activities of state interest and establish minimum criteria for the administration of such areas and activities. ¶ Historical or archaeological resources of regional or statewide importance means resources which have been officially included in the National Register of Historic Places designated status, or included in an established list of places compiled by the State Historical Society. ¶ Areas containing, or having a significant impact upon historical, natural, or archaeological resources of regional or statewide importance shall be administered in a manner that will allow man to function in harmony with, rather than be destructive to these resources . . . . Development in areas of historic, educational, archaeological or natural value shall be conducted in a manner which will minimize depletion of those resources for future use." The design of a program to carry out the archaeological requirements of H.B. 1041 and its implementation are discussed.(1)

Hester, Thomas R. (Texas, San Antonio) LATE PREHISTORIC CULTURAL PATTERNS ALONG THE LOWER RIO GRANDE, TEXAS. Recent research in the lower Rio Grande area of Texas has produced new information on the late prehistoric peoples of that region. In this paper, data are presented on the chronology, settlement system, subsistence regime, trade contacts, and technology of this period. Regional variations of late prehistoric culture are examined and comparisons are made with late prehistoric developments in the adjacent Chihuahuan Desert.(22)

Hewitt, James M., A REAPPRAISAL OF THE DEVELOPMENT OF VILLAGE FARMING IN EARLY FORMATIVE MESOAMERICA. Recent hypotheses for the development of village farming in Mesoamerica and elsewhere have stressed the gradual transition from a hunting and gathering seasonal or seasonal-round settlement-subsistence pattern to a sedentary agricultural pattern. Work by MacNeish and his associates in the Tehuacan Valley has demonstrated the inadequacy of the concept of "The Neolithic Revolution" (Childe 1925) by documenting the utilization of cultivars 2500 years prior to the first agricultural villages in that area. The purpose of this paper is to show that, although cultivars were incorporated into the subsistence pattern of non-sedentary hunters and gatherers in the Tehuacan Valley prior to the beginning of the Ajalpan phase (1500 B.C.), it does not necessarily follow from the data that a gradual evolution to sedentary agriculture occurred. Indeed, changes in artifact and plant frequencies before and after the Ajalpan phase show a dramatic reversal that is related to the apparently sudden appearance of village farming. Published data from the Tehuacan Valley and the lowlands of the Pacific and Gulf Coasts are reviewed, and a new model for the origin of village agriculture is presented. The interaction of highland and lowland settlement-subsistence systems, resulting in the fusion of highland cultivars with the coastal sedentary settlement pattern, is postulated as the ultimate source of village farming in Mesoamerica.(43)

Heyden, Doris (Instituto Nacional de Antropologia, Mexico) WATER AND FIRE SYMBOLS IN MEXICAN MANUSCRIPTS. The atl-tlachinolli, "burning water," is the water-fire element that has been one of the recurrent themes in Mexican iconography throughout most of the prehispanic period. This union of opposites, the Mesoamerican yin and yang, undoubtedly had a different significance at the end of this long period—when it symbolized war among the Aztecs—than at the beginning. The early manifestations probably were in Teotihuacan, during the Classic period. Symbols of water and of fire in the Borgia Codex group are analyzed, as to form and meaning, in an effort to determine their place in the development of this leitmotif.(12, 13)

Hibben, Frank C. (New Mexico) PALEO-INDIANS IN THE ALBUQUERQUE AREA. Recent discoveries demonstrate that the middle Rio Grande valley is a major area for the Paleo-Indian. Excavations at the Rio Rancho site show an extremely large Folsom living site with evidence of circular lodges. Debris at Rio Rancho indicates all stages in the manufacture of Folsom points including large numbers of Pre-forms. Current excavations at Rio Rancho and also at Comanche Springs, south of Albuquerque, show evidence of Sandia, Clovis, Folsom, Eden, and the "J" complex.(33, 34)

Hietala, Harold and C. Reid Ferring (Southern Methodist) PATTERN RECOGNITION ANALYSES AT AN ISRAELI UPPER PALEOLITHIC SITE. Level one from Ein Akev East, a Late Levantine Aurignacian site in the Negev Desert, Israel, was analyzed for intrasite patterning. This level was excavated in 0.25 $m^2$ units over a contiguous area of 100.75 $m^2$, from which about 2000 retouched tools, 640 cores and 17,000 pieces of debitage were recovered. Pattern recognition analyses applied spatially and aspatially are discussed with respect to tools, debitage, and archaeological features. Spatial analyses utilizing different analytical approaches and applied to varying artifact classes are discussed from the viewpoint of efficacy in recognition of spatial patterns. Co-variational patterns between artifact classes and/or archaeological features are also discussed from several points of view. A summary suggesting the utility of various analytical approaches insofar as they relate to archaeological interpretation relative to this data base is presented.(35)

Hill, Frederick C. (Louisville) ECOLOGICAL AND CULTURAL INTERPRETATIONS OF ARCHAEOLOGICAL SITES BASED ON ANALYSIS OF FRESHWATER MUSSELS. Freshwater mussels from archaeological sites provide a wealth of information about the paleoecology and inhabitants of the site. Discussed in this paper is the method of growth ring analysis of freshwater mussels as well as certain aspects of trace element composition of the subfossil shells. The use of these methods in determining season of site occupation and various paleoecological aspects of the archaeological site determined from the mussels are discussed.(11)

Hitchcock, Robert K., Bryan A. Marozas, and James I. Ebert (New Mexico) ANALOGY AND THE ARCHAEOLOGY OF HUNTERS AND GATHERERS. One of the most commonly cited avenues to understanding in the archaeology of band-level peoples is ethnographic analogy. This exercise all too often takes the form of a conceptual "translation" between a specific ethnographic occurrence and the appearance of a limited and unique segment of the archaeological record. The few successful attempts at analogy in the literature have involved an intermediate step in the translation process: the consideration of theory. The importance of explicating behavioral and record-formation processes in archaeological analogy is illustrated with reference to hunter-gatherer water stress in the Kalahari region of Botswana.(27)

Hitchcock, Robert K. (see Ebert, James I.)(27)

Hoffman, Charles A., Jr., and Sandra L. Rayl (Northern Arizona) A PALEO-INDIAN KILL SITE IN NORTH FLORIDA. Three seasons of work at the Guest site in the Silver Springs valley of north Florida are discussed, especially the finding of the remains of presently extinct megafauna in direct association with man-made objects. Discussion includes the discovery of fairly well articulated remains of two young mammoth, fragments of deer, large cat, bison, and turtle. These remains were found in a single stratum varying about 15 cm thick, buried beneath about 2.5 m of marl. Stratigraphic sequences are presented, as well as illustrations of stone projectile point and other chipped stone artifacts. Fragments of bone, referred to as bone "pins" are reported for the strata above the level in which the mammoth remains were found. Evidence is presented to suggest the Guest site is a "kill site."(33, 34)

Hole, Frank (Rice) PERSPECTIVES ON PASTORALISM IN PREHISTORY. Investigation of modern tribal pastoralists in Luristan, Iran, reveals patterns of subsistence and seasonal movements which shed light on both the history of nomadism and on our ability to find and interpret its evidence archaeologically. The special nature of pastoralism in Luristan and in similar areas of Southwest Asia raises doubts about many ideas concerning the genesis of nomadism and its relationship to agriculture. The discovery and excavation of a nomadic camp dating to about 6000 B.C. is exemplary of the importance of joint ethnographic and archaeological investigations.(36)

House, John H., and Michael B. Schiffer (Arkansas Archeological Survey) THE CACHE RIVER ARCHAEOLOGICAL PROJECT: SUBSTANTIVE RESULTS. While acquiring information needed for federal agency long-term planning purposes, the Cache Project operationalized several research designs involving substantive questions. The data yielded by the application of the Cache Project sampling design complement previous reconnaissance data by providing information on the number, density and patterns of distribution of archaeological components. The survey artifact samples proved useful in studies of lithic resource procurement and determination of cultural boundaries and distributions of human population during various stages. Although the information on the populations of archaeological phenomena in the Cache Basin provide only crude measures of systemic variables of interest, the information is a considerable improvement over reconnaissance data and suggests directions for the development of methods for using contract project survey data in measuring systemic variables.(9)



House, John H. (see Schiffer, Michael B.)(9)

House, Kurt (Southern Methodist) TOWARD PROGRESS IN FAUNAL ANALYSIS: APPLICATIONS IN TEXAS. While faunal remains were among the first non-artifactual material used in archaeology, the potential offered by adequate faunal analyses has not been realized in attempts to reconstruct past behavior. Notwithstanding recently reorganized theoretical goals oriented toward the collection of maximal site information, some reports still appear in which conclusions are formed and hypotheses developed regarding exploitative strategies without the participation of faunal evidence. The development of the New World osteo-archaeological tradition has occurred in the milieu of biological theory, paleontological techniques, and archaeological needs, but as yet produced a small population of specialists unable to meet growing demands. Frequently the paleontologist or zoologist, while qualified, is unwilling to turn from his own research and, in addition, lacks interest in the interaction of man and contemporary animals in a dynamic environment. The application of these realizations in Texas, as well as how improvement is possible, is considered significant.(27)

Hughes, Jack T. (West Texas) THE REX RODGERS BISON KILL. Located in Mackenzie Reservoir in the Texas Panhandle, and excavated in the fall of 1973, the Rex Rodgers bison kill produced the remains of at least six animals resembling both Bison occidentalis and B. antiquus. The group is marked by strong sexual dimorphism. Of the five projectile points recovered, two show resemblances to both Clovis and Plainview points, while three share characteristics with San Patrice, Simonsen, and Hardaway points. The kill occurred in winter during a cool moist climatic interval. C-14 dates are not yet available but other evidence indicates an age of about 10,000 years.(33, 34)

Hurt, Wesley R. (Indiana U Museum) THE EDGE-TRIMMED TOOL TRADITION. Previous classifications of South American preceramic lithic tool traditions that lack stone projectile points do not encompass the full range of variation found in representative sites. Therefore, a new stone tool tradition, the "Edge-trimmed Tool Tradition," characteristic of northwest South America, is defined. Diagnostic of this tradition are simple scrapers and spokeshaves which have their working edges retouched by percussion flaking. The efficiency of these tools is evident in their persistence from a time of about 12,500 years ago to well into the ceramic periods (after 2000 B.P.). It is postulated that this lithic assemblage was used for making wood artifacts such as projectile points and knives by peoples who lived in a forested environment. It is doubtful that the lack of stone projectile points can be attributed to a lack of knowledge on how to make this tool. Radiocarbon dates indicate the Edge-trimmed Tool Tradition to have been contemporary with other cultural complexes in surrounding areas which made stone projectile points. A possible source or origin of this tradition is in the general area of the Cauca and Magdalena River Valleys of Colombia.(33, 34)

Huse, Hanna (Colorado State Archaeologist Office) COLORADO'S COOPERATIVE SURVEY PROJECT NO. 1. The Office of the State Archaeologist of Colorado and the Colorado State Archaeological Society (amateur and professional) is entering into a mutual effort called Cooperative Project Number One. Archaeological Society chapters are doing site survey on private lands in developing areas. Recording standards are set by the State Office. Hopefully this project will strengthen professional-amateur relations as well as add needed information to the state site inventory.(1)

Irwin, Henry T. (Michigan) and Guy R. Muto (Washington S)(3)

Irwin-Williams, Cynthia (Eastern New Mexico) EXPLAINING THE MOVEMENT OF MATERIAL CULTURE OBJECTS IN PREHISTORY. The movement of material culture objects is seen as a reflection of more general interaction networks within and between cultural systems. In this discussion, the problems of the identification of points of origin for specific objects (other than by material source) are dealt with in terms of model formulation and statistical treatment. In addition, an attempt is made to derive a general predictive model for the movement of objects within an exchange system.(18)

Ives, David J. (Missouri) HEAT-TREATMENT EXPERIMENTS: FACT OR FICTION? Prehistoric heat-treatment studies usually utilize one or several replication experiments in an effort to reproduce that particular combination of physical characteristics that the researcher recognizes as indicative of heat-treated materials. However, these attempts to reproduce prehistorically-derived changes in lithic materials fail to take into consideration all those factors that might participate in such experiments. Because of the large number of replicative experiments dictated by such factors, heat-treatment experiments must, of necessity, be noted as indicators and not as determinants.(44)

Jennings, Jesse D. (Utah) ARCHAEOLOGY OF SUDDEN SHELTER. This progress report describes Sudden Shelter, a site on the western edge of the San Rafael Fremont subarea, and some of the implications of the site and its content. The site was a deep (4.2 m) accumulation of alternating cultural and sterile colluvial strata, within a large shelter, going back in time to 8000+B.P. Some 250 $m^2$ were excavated, artifact yield was heavy; it included hundreds of named and described chipped flint types, food grinding tools, thousands of food bones, scores of fireplaces of five different types that change through

time, etc. The location of site at 7200 foot elevation, and its apparent continuous occupancy (ceramics being recovered from the topmost layers), make the site unique in this area. Although data for dietary (animal and plant), pollen, flint tool, flint debitage, obsidian dehydration, and some environmental studies were collected (and such studies are currently underway), only preliminary findings are available at this time.(6)

Jeter, Marvin D. (see Reynolds, William E.)(27)

Jimenez-Moreno, Wigberto (Consejo de Historia, INAH, Mexico) THE WORLD DIRECTIONS AND THEIR GODS IN MESOAMERICAN CODICES. Already in Teotihuacan there existed an incipient arranging of the world directions, with gods assigned to them. Later, in the post-Classic horizon, a new and more elaborated distribution of gods and colors to the world directions is to be found in such codices as Borgia and Laud. Finally, through the study of archaeological monuments, pre-Conquest and post-Conquest codices, and Indian annals, as well as sixteenth century chronicles such as "Historia general de las cosas del Nueva Espana" by Sahagun, and the interpretative efforts of Mexicans and foreign Mexicanists such as Del Paso y Troncoso, Caso, Seler, Thompson, and Nicholson, it was possible to rescue the world-view of the Mexica and to obtain such a wealth of information that, thanks to it, we can try to reconstruct the outlook of earlier periods. Many investigators have stumbled in the apparent contradictions when assigning different gods and colors to the world directions. In order to clarify this, one has to realize that we have to understand that in the course of time, the outlook changed, and certain gods like Huitzilopochtli became important and replaced others. Also, the directions when visualized—like in Codex Borgia—from Cholula, as it seems probable—are not the same as when looked upon from the Valley of Mexico.(12, 13)

Johnson, Alfred E. (Kansas) PATTERN RECOGNITION IN A GRAVETTIAN SITE IN YUGOSLAVIA. During the summer of 1974, by means of a cooperative agreement between the University of Kansas and the Zemaljski Muzej Bosne i Hercegovine, with financial support from the National Science Foundation, excavations were conducted at the Upper Paleolithic Gravettian site of Kadar in northern Bosnia, Yugoslavia. On the basis of tools recovered and observations made on artifact distributions in the field, it is hypothesized that the site represents a repeatedly-occupied hunting camp. Analyses of exact provenience data on all artifacts, by means of pattern recognition techniques such as trend-surface mapping and nearest neighbor analysis, are used to test the hypothesis and as well to search for patterns of intra-site variability.(14)

Johnson, Charles, RECENT DEVELOPMENT AT THE LUBBOCK LAKE SITE, WEST TEXAS (33, 34)

Johnson, Eileen (Texas Tech) A REVIEW OF THE DEVELOPING METHODOLOGY IN ZOOARCHAEOLOGY. The development of zooarchaeology as a sub-discipline of archaeology has proceeded at first slowly but recently quite quickly since the early 1950s. Recognition of the importance of faunal remains to cultural interpretation is no longer limited to the occasional "inventory of laundry list" appendix in a site report. Data from developing methodology has and will aid archaeologists in interpretation of subsistence systems, social organization and other cultural patterns as well as interpretations of the local environment. Subsistence system covers a major portion of archaeological work and as such the major contributions of zooarchaeology have been in this area of study. But zoöarchaeological research is not limited to animals hunted or domesticated, and environmental studies are increasing. Furthermore, zooarchaeological contributions are not limited to archaeological studies, but have relevance in such disciplines as taxonomy and zoogeography and the many sub-disciplines of zoology and geology. In reviewing the methodology, the existence of principles or theories of zooarchaeology is discussed briefly with statements of some of the current problems in the sub-discipline.(11)

Johnson, Jay K. (Southern Illinois) MICROPATTERNS IN THE SETTLEMENT OF THE INTERMEDIATE PLAINS, CHIAPAS, MEXICO. Preliminary results of site survey and mapping in a distinct environmental zone of the Northwestern Maya Periphery, in the region of the Classic site of Palenque, are presented. Particular attention is paid to community settlement pattern as opposed to zonal patterns. The presence of a formal plaza arrangement which has been previously defined from Peten data is demonstrated. The implications of this discovery for social organization and population movement are then examined.(43)

Johnson, L. Lewis (Vassar) SOUTH AMERICA. Recent lithic research in South America is quite varied in its aims and methods. Research on stone tools of the ceramic periods is basically non-existent, although some analysis on Ecuadorean materials has recently been done and some obsidian hydration studies have been carried out on ceramic period artifacts. The major effort in the study of preceramic materials remains the elucidation of the nature and spread of industries in the continent. Of particular interest are the burgeoning number and variety of Paleo-Indian sites in the region. The ecological correlates of preceramic occupations are also receiving much attention. Technological analyses, although not common, have begun to be carried out in the area and can be expected to increase in frequency in the coming years.(42)

Johnson, L. Lewis (see Button, Aileen F.)(3)



Judge, W. James (Chaco Ctr, Natl Park Service) ARCHAEOLOGICAL SAMPLING AND CULTURAL RESOURCES MANAGEMENT. The satisfaction of many archaeological research designs, as well as the satisfaction of Section 106 of the National Historic Preservation Act, frequently carries the assumption of attaining a complete sample of the area or site under investigation. To date, the issue of the relationship between archaeological sampling and the satisfaction of both research designs and the legal requisites of the enabling legislation has yet to be dealt with. Assuming one can demonstrate the efficacy of sampling as an essential tool in the preservation of cultural resources, the question of what constitutes an adequate sample becomes of crucial importance. This paper addresses itself to these problems with the intent of clarifying the issues, rather than proposing solutions, in the hope that discussion can eventually lead to their resolution.(9)

Justeson, John S. (Stanford) A PRELIMINARY TO PROCESS IN INFORMATION-THEORETIC APPROACHES. Coding, not entropy or uncertainty, is the central concept of information theory, and is crucial for relating environmental inputs to cultural behavior. It is therefore the basis of the relevance of information-theoretic approaches to anthropological data. This paper attempts to validate the use of such code/channel models by developing a description for the general class of culturally relevant models of coding, and testing them at a comprehensive rather than a particularistic level.(23)

Katz, Paul and Susanna Katz (Texas Tech) A LITHIC ANALYSIS OF THE SETTLEMENT PATTERN IN THE LOWER TULE CANYON, BRISCOE COUNTY, TEXAS. A recently concluded survey and limited testing program was concerned with a portion of Tule Canyon from its juncture with the Palo Duro Canyon to a point 17 miles upstream. A pattern of site distribution was observed which has the following general characteristics: (1) Sites were located either along the rim, on knolls at various elevations from rim to bottom, on terraces along the creek, or on the floodplain at the mouth of the creek. (2) Sites in a similar topographic location had a similar type or types of raw material, which differed significantly from sites in other topographic locations. (3) In addition to raw material type, the amount of material at the site and the nature of tools and debris differed between sites in each topographic situation. (4) The sites in each similar location are considered contemporaneous, but each group is chronologically distinct from the other three. In addition, every site has only one component. The usual variables of time, space, raw material, and activity are thus fairly well controlled. A lithic analysis can be expected to produce results which pertain almost exclusively to technological variation. The results of that analysis are discussed in this paper.(3)

Katz, Susanna (see Katz, Paul)(3)

Kehoe, Thomas F. (Milwaukee Public Museum) THE PALEO-INDIAN BISON DRIVE: FEASIBILITY STUDIES. Whether Paleo-Indian used the techniques of the "complex, ritualized, planned bison drives" of the Late Prehistoric Plains has long been questioned. Information from native informants, historical sources and sites excavated by the author are examined and compared to the data from Paleo-Indian bison kill sites.(33, 34)

Keller, John E. (Texas Highway Dept) PALEOECOLOGICAL CONDITIONS AND SUBSISTENCE POTENTIAL AT THE GEORGE C. DAVIS SITE. An investigation of potential subsistence resources within five miles of the George C. Davis site in Cherokee County, Texas, indicates that non-domesticates would be quite capable of supporting a very large population. This appears to invalidate the theory that population dispersal during the late prehistoric was related to soil depletion and subsequent failure of the Caddoan agricultural system. It is suggested that wild food materials were utilized to supplant as well as supplement the aboriginal diet.(27)

Kellers, James McW., MICROSCOPIC STUDY OF PERUVIAN TEXTILES. Hair-by-hair microscopic investigation of textiles from Peru revealed the inclusion of hair with scale pattern identified as ocelot. These hairs are inferred to be a purposeful inclusion in the design/construction of an otherwise llama-llama fibre ground. As ocelot hairs are short and not generally spun, this discovery of a single occurrence raises questions of technology, cultural contact, and ecology.(14)

King, Denise E. (see Allsburg, John B. Van)(14)

Kittleman, Laurence R. (Oregon) GEOLOGY OF DIRTY SHAME ROCKSHELTER. Dirty Shame Rockshelter is in the canyon of Antelope Creek, a headwaters tributary of the Owyhee River. The region is a deeply dissected canyonland made of flat-lying, faulted Miocene and Pliocene volcanic rocks, mainly rhyolites capped by basaltic rimrock. The elevation of upland surfaces is about 5000 feet (1500 m). The rockshelter, a shallow indentation beneath a spectacular overhanging cliff of rhyolite, probably was formed by lateral cutting of Antelope Creek, now about 7 m below the site. Occupational deposits in the rockshelter are about 2 m thick and grade downward into stream sand, with scant artifacts, that was excavated to a depth of about 3.5 m below the present surface. The fine-grained, dusty occupational deposits are discontinuously layered on a scale of centimeters. They contain vegetable debris, seeds, charcoal, phytoliths (opaline parts of grass), knapping waste, angular pebbles, and mineral silt. There are scattered cobbles and boulders that fell from the roof, but no single fall or sequence of falls is recognized. Most of

the deposits came from plants and stones brought there by the inhabitants, except for subordinate mineral silt, some of which may be windblown, and fallen stones. The neighborhood of the site affords slabs of basalt or rhyolite good for milling stones and rough tools, but there is almost no raw material good for knapped tools. Most artifacts of obsidian and chalcedony found in the site must have been made from material gathered beyond the environs of the rockshelter. Preliminary results from obsidian hydration analysis show that thicknesses of the hydrated layers range from 2.6 to 6.8 micrometers. Measurements of obsidian specimens found associated with cultural features are stratigraphically ordered, but there is also evidence of stratigraphic mixing and re-use of tools.(17)

Knobloch, Patricia (SUNY Binghamton) RESEARCH PROJECT: HUARPA CERAMIC ANALYSIS. A late Early Intermediate Huarpa ceramic collection was made during a mapping and reconnaissance project on the Middle Horizon site of Wari, Department of Ayacucho, Peru, in July 1974. The project was headed by William Isbell, with Katharina Schreiber and Patricia Knobloch, graduate assistants, all of whom are from the State University of New York at Binghamton. The analysis of this material has importance for both the qualitative need of a more concise Huarpa ceramic description, and, more reliably, the quantitative and comparative feature of the ratios from vessel shape frequencies.(39)

Knudson, Ruthann (Idaho) THE NORTH AMERICAN PLAINS. Studies of stone tools from the North American Plains have taken numerous directions and dimensions, particularly in the last decade. While culture-historical chronologies based on projectile point typologies still dominate the region's archaeology, truly analytical endeavors are making significant contributions. Major culture-historical syntheses have been developed from lithic tool kit analysis, and from obsidian hydration data. Technological systems analysis has been applied to assemblages and complexes from all temporal periods, and bipolar flake production is becoming widely recognized. Lithic resource areas have been a focus of numerous studies, ranging from variation in quarry and reduction techniques to an examination of regional trade systems. Tool utilization analysis has been frequent, including detailed edge damage studies and more morphologically based tool kit descriptions. The great assortment of archaeological data from this vast region should support an even greater diversity of lithic problems in the future.(42)

Kohler, Tim A. (Florida) SUBSISTENCE AND SETTLEMENT AT THE GARDEN PATCH SITE, FLORIDA. 8Di4 is a Proto- and Early Weeden Island minor ceremonial center situated on the salt marsh/mesic hammock ecotone of Florida's north peninsular Gulf coast. Testing of mounds and middens reveals intra-site patterning in use of faunal resources. Hypotheses are advanced to explain this sub-area's apparent demographic decline after the Weeden Island period and the fluctuation in the use of mollusc resources over time.(2)

Kolata, Alan L. (Harvard) THE GHOST IN THE MACHINE. Recent theoretical formulations concerning the development of complex societies, being grounded in a materialist philosophy, relegate the impact of ideology to a secondary role. This paper suggests that this need not be the case. To illustrate this, the relationships between "outward" cultural manifestations in art and psychological processes is explored and applied to the development of Olmec and Chavin.(10)

Korth, William (see Gunn, Joel)(3)

Kowalewski, Stephan A. (Arizona) ECONOMIC REFORMATION AND THE COLLAPSE OF MONTE ALBAN. The change between Classic and Postclassic in the Valley of Oaxaca, Mexico, was from a powerful, centralized state to a far more decentralized political system involving many small cacicazgos. This is described as a basic reorganization of the social modes of production and distribution. New data from an intensive settlement survey in the area surrounding Monte Alban illustrate this trend, but also raise some problems for Postclassic time/space relationships.(43)

LaBianca, Øystein (Brandeis) LOGISTICAL ASPECTS OF FAUNAL ANALYSIS IN PALESTINE. The questions I plan to discuss relate to the logistical problems encountered by the zooarchaeologist participating with a large archaeological excavation (75 staff members, 150 hired workmen) at a multi-period historical site in Palestine. At such sites logistical problems present themselves as a result of (1) the large number of bone fragments unearthed daily (sometimes more than 1000 per day); (2) the political and economic restrictions on transporting the bone sample to the United States for further study; and correspondingly (3) the limited amount of time available for the analysis of the bone fragments. Such limitations necessitate full exploitation of the opportunities for in-the-field faunal analysis. The questions that must be dealt with under these circumstances are: (1) What are some tenable goals for the quality and quantity of the bone sample to be analyzed? In view of these goals, (2) What are the requirements in terms of laboratory space and equipment in the field? (3) What are some means whereby a comparative collection can be acquired in the field? (4) To what extent can the zooarchaeologist train and employ volunteer staff and workmen to assist with the processing of the bone fragments for analysis by the zooarchaeolgist? (5) How does the zooarchaeologist communicate preliminary field identifications of animal fragments to the excavation staff? (6) How can a computerized data processing system be utilized in expediting the analysis of the bone fragments? These and related questions are discussed in terms of my particular experience with the Andrews University Heshbon Expedition in Jordan.(24, 25)



Lange, Frederick W. (Beloit) PRELIMINARY RESEARCH IN THE NOSARA VALLEY, COSTA RICA. The archaeologically unknown Nosara Valley, on the lower Pacific coast of the Nicoya Peninsula of Costa Rica, was identified in Spanish contact period documents as a secondary cacao producing region. As the only such area in that portion of Costa Rica traditionally accepted as having been Mesoamerican influenced, it was suspected the presence of this resource may have affected development of this region distinctively from the area surrounding it. A preliminary project was implemented to determine the geographical and temporal distribution of Pre-Columbian populations in the area, and their wider cultural affiliations.(39)

Larson, Lewis H., ECOLOGICAL SYSTEMS (7)

Lavine-Lischka, Leslie (Arizona) AN APPROACH TO LITHIC ANALYSIS FOR DERIVING CULTURAL INFERENCES. It is now widely accepted among archaeologists that culture is patterned and the disturbances created therefrom appear in the archaeological record. Thus the pattern of occurrence of material on an archaeological site has been culturally determined. The archaeologist's challenge is to determine ways of detecting and interpreting these patterns in order to make strong cultural inferences. Examination of total lithic assemblages, both artifacts and debitage, can form one basis from which to partially reconstruct the anthropology of former populations. The process and order of such a reconstruction involves creation of a morphological typology for the entire assemblage, mapping spatial distributions in order to determine activity areas and particular chipping processes (as these are also culturally tagged), and finally examining and correlating the results with the rest of the site information. Based on this theoretical and methodological approach, the lithic assemblages from nine sites along Miami Wash near Globe, Arizona, have been analyzed. The results include the ability to infer specialized site funcitons, diverse activity areas, and several particular chipping processes, and where they took place on a site.(35)

Lawrence, Barbara (Harvard) ANALYSIS OF UNIDENTIFIABLE BONE FROM CAYONU, AN EARLY VILLAGE FARMING COMMUNITY. The value to the archaeologist of saving unidentifiable scrap needs to be defined. Total recovery of all bone has increasingly become a goal for excavators, but the time involved, both in screening and in processing the total scrap recovered, seems not always commensurate with the information obtainable. Three sorts of analysis have been tried on the Cayonu material: (1) relative abundance of different sizes of fragments and their spatial arrangement in the site; (2) comparison, for a selected unit in sequential levels of known area, of total abundance of bone with the amount and kinds of seed recovered; (3) a fragment-by-fragment scrutiny of all scrap from a single season's excavations to seek for and classify evidence of use or purposeful modification. All of these relate to within-site problems, as does the lack of evidence for butchering practices obtainable from the scrap. Because of the high degree of variation in condition and kinds of scrap recovered from different sites, and because of the total rather low level of return for time spent studying such material, it is probably not worth attempting to standardize scrap analyses for purposes of intersite comparisons.(24, 25)

LeBlanc, Stephen A. (UCLA) EXCAVATIONS ON THE MIMBRES RIVER, NEW MEXICO. A report on the Mimbres Archeological Center's first season's excavations. Several Classic Mimbres and a "Salado" site were tested including additional work at the Mattocks site. Attention is also given to estimating what can be learned from the pillaged Classic Mimbres sites and on the success of efforts to stop these activities.(20)

LeBlanc, Stephen A. (see Read, Dwight)(4)

LeBlanc, Stephen A. (see Watson, Patty Jo)(37)

Leeds, Leon L. (York) LANDFORM ANALYSIS AT THE RICH WOODS SITE: CONTROLLING THE EFFECTS OF LAND LEVELING. Extensively leveled mound sites seem to be of the lowest priority for continued efforts toward preservation, and for the funding of salvage or problem-oriented research projects. This is particularly unfortunate since large mound sites, which are the most usual targets of land leveling, provide the best data for testing the whole structure and developmental processes of proto-urban communities. Landform analysis, through mapping and air photo interpretation, is used here to demonstrate that the magnitude of leveling can be specified, its differential effects on a sample can be evaluated and that, in general, leveling can reveal as much information as it obscures.(14)

Linares, Olga F. (Smithsonian) DIFFERENT USES OF MARINE RESOURCES ON THE PACIFIC AND ATLANTIC COASTS OF WESTERN PANAMA. It is often assumed that the marine resources of both coasts of the New World were roughly equivalent. This assumption is incorrect. Both species diversity and number of individuals (or population) are different, and so are the ecological conditions (i.e., terrestrial and marine biomes) in which they occur. In addition, the floral and mammalian faunal components on both sides of the Isthmus are very different. These facts had a determining influence on prehistoric coastal adaptations in Chiriqui and Bocas del Toro province in Western Panama.(2)

Lindsay, Alexander J., Jr. (see Dean, Jeffrey S.)(37)

Lipe, William D. (Museum of Northern Arizona) ARCHAEOLOGICAL CONSERVATION AND THE WILDERNESS. Inclusion in wilderness areas can help protect archaeological sites or groups of sites. Preservation of surrounding topography and biota may also be of assistance to the archaeologist in reconstructing past environments. The wilderness area concept can bring archaeologists together with other scientists and with conservationists in joint efforts to preserve and manage resources of interest to each. Such combined efforts are likely to have more success than the individual efforts of each type of specialist on behalf of particular resources. Wilderness area status, of course, imposes rather severe restrictions on persons entering the area, including archaeologists. Ordinarily, no motorized vehicles or heavy power equipment can be brought in, for example. Recent research in the Grand Gulch Primitive Area, southeastern Utah, illustrates some of the problems and benefits in working in a wilderness context. More pressing is the question of the place of archaeological research in a long-range wilderness management framework. Archaeologists and public lands managers must work together to develop guidelines.(26)

Lipe, W. D. (Museum of Northern Arizona), R. G. Matson, and Paul Sneed (British Columbia) THE CEDAR MESA PROJECT. The Cedar Mesa Project is a study of an approximately 500 $km^2$ mesa-top and canyon region in the pinyon-juniper vegetational zone of southeastern Utah. Data collection was by surface survey and minimal test excavations. The survey was implemented by a stratified random sampling design. Five out of the 20 watershed units in the area were chosen as sampling clusters. Within these, a 7% sample of 400 $m^2$ quadrats was completely surveyed for environmental and archaeological data. Also within the five watershed units, the canyon environments were fully inventoried, and a stratified random sample of the sites encountered was chosen for fuller study. The results to date give confidence in the sampling design as providing reliable estimates of most of the populations of targeted cultural and environmental variables. Substantive results include the following: sites are abundant in the Basket Maker (BM) II period, less so in BM III; the area is abandoned during Pueblo (P) I and early P II times, but reoccupied from late P II through mid to late P III, then abandoned again. This sequence of occupation and abandonment can be tentatively correlated with climatic and cultural-adaptive changes. A substantial shift in settlement pattern occurs between BM II and BM III sites; less so between the BM III and Pueblo sites. Several, functionally different types of sites can be distinguished for the several occupation periods, and their environmental relationships are being explored. For example, there appear to be interesting distributional differences between habitation and special use sites.(37)

Lischka, Joseph J. (Colorado) PERIODIC CATASTROPHISM ON THE PERUVIAN COAST. The term "periodic catastrophism" refers to a situation in which the normal environment is upset at regular intervals. Such a situation exists on the west coast of Peru where El Nino occurs every 25-40 years and causes massive destruction of marine life. A hypothesis is presented that relates the effects of El Nino to cultural development on the Peruvian coast from 2500 B.C. to 1800 B.C.(39)

Luedtke, Barbara, (Massachusetts-Boston) LITHIC MATERIALS AND SOCIAL BOUNDARIES. Although archaeologists have long recognized the presence of "exotic" cherts and other materials at sites, and have postulated trade connections on the basis of these nonlocal materials, the source identifications have usually been ambiguous and open to argument. The various techniques of trace element analysis developed over the last decade have allowed positive identification of chert types, and this has provided a means of approaching many problems of prehistoric social and spatial relations. In this paper, distributions of cherts from a number of sources will be used to search for and examine the nature of social boundaries existing in Michigan during the Late Woodland period. These boundaries will be compared with ecological boundaries and with historically documented social boundaries and trade patterns.(3)

Luedtke, Barbara (see Nelson, Charles)(2)

Lyons, Ray (Colorado Archaeological Society) RELATIONSHIPS OF THE STATE ARCHAEOLOGIST WITH AMATEUR ARCHAEOLOGISTS. A State Archaeologist needs a broad base of support if his program is to be effective. In addition to legislative authority and sufficient financing, he must have the active support of people who have knowledge and interest in his programs. Amateur archaeologists are the largest and best informed group of people available to provide this support. They have interest, enthusiasm, and a desire to contribute. Their numbers include experts in many crafts and professions. Many are organized into state and local societies. Legislative support, publicity, volunteers to work on both emergency and long term projects, advisory committees to work on projects and long term programs, legal and specialist services, are but a few of the situations where a State Archaeologist may benefit from the participation of amateurs. A State Archaeologist may benefit from acquainting himself with the amateur resources available to him and integrating them into his program.(1)

Mack, Joanne M. (Oregon) A REPORT ON CERAMICS FROM THE KLAMATH RIVER. This report describes and discusses briefly the significance of pottery and clay figurines excavated from three sites (35 KL 16, 18 and 21) along the middle course of the Klamath River in Oregon, dated between A.D. 1300 and A.D. 1500 by C-14. It deals briefly with the



question as to the source of these ceramics: independent invention, influence from Paiute groups, trade with Paiute groups or influence from south-central and central Californian groups.(6)

MacNeish, Richard S. (R. S. Peabody Foundation) ARCHAEOLOGICAL SEQUENCE IN CAVES IN SOUTHWESTERN TAMAULIPAS. This is basically discussions of the various types that characterize the following phases: Infiernillo, Ocampo, Flacco, Guerra, Mesa de Guaje, La Florida, Palmetto, San Lorenzo, and the San Antonio. Emphasis in defining these phases is placed on the sequence of projectile point types, scraper types, and types of fabric. This sequence with some gaps runs from about 7000 B.C. to A.D. 1750 and as we point out some of the types have more connections with the materials from the Nuevo Leon than they do with the Sierra de Tampaulipas.(16)

Madden, Louis A. (George Washington) DEFINING SUBGROUPS IN A CEMETERY POPULATION: A MULTIVARIATE ANALYSIS OF BURIAL PATTERNS. Numerical taxonomy and cluster analysis is applied to the problem of determining culturally relevant subgroups within a cemetery population. Particular emphasis is placed on the difficulties and limitations which affect the validity of the method in an archaeological context. The error introduced through subjectively selecting and coding attributes is contrasted to the major advantage of objectively evaluating and grouping burials. The method is applied to a cemetery population associated with the Mobridge site (39WW1) in northern South Dakota. Age is found to be the most significant burial attribute and three age groups, which receive differential treatment at death, are defined.(14)

Magnus, Richard W. (Banco Central de Nicaragua) PRESENT ARCHAEOLOGICAL RESEARCH IN CHONTALES, NICARAGUA: ITS IMPLICATIONS FOR THE PREHISTORY OF LOWER CENTRAL AMERICA. A part of the present archaeological program of the Banco Central de Nicaragua has the goal of determining the cultural and ecological relationships of Chontales, Nicaragua. Preliminary studies to that end are presented, including comparisons of the Chontales ceramic and faunal remains with those of the Atlantic and Pacific coast peoples. The implication of this work is that the Chontales peoples are primarily local developments and had little dependence on other zones either ecologically or culturally. This hypothesis is significantly different from previous views of Central America as largely derivative from Meso- and South America.(39)

Marks, Anthony E. (Southern Methodist) UPPER PALEOLITHIC SITES AND CHRONOLOGY IN THE CENTRAL NEGEV, ISRAEL. Survey and excavations since 1969 have brought to light 16 Upper Paleolithic sites in the Avdat/Aqev area of the Central Negev, Israel. All of these are single or multiple occupations by single groups, with the exception of site Boker which contains the nine stratified occupations, each representing a different typological and technological "phase." Combined, all these sites span the entire length of the known Levantine Upper Paleolithic and, in fact, push the beginning date for a consistent Upper Paleolithic blade technology to before 45,000 B.P. The seqence of assemblages, seen from C-14 dates and stratigraphic position suggests a somewhat different pattern of assemblage development than has been noted for northern Palestine.(36)

Marozas, Bryan A. (see Hitchcock, Robert K.)(27)

Marrinan, Rochelle A. (Florida) COASTAL ADAPTATION IN THE LATE ARCHAIC. The abundance of molluscan remains on Late Archaic coastal sites (ca. 3000-1000 B.C.) has resulted in a general stereotype of aboriginal inhabitants subsisting primarily on this resource. Excavations in two shell rings on St. Simon's Island, Glynn County, Georgia have resulted in a systematic look at the nature of the coastal adaptation in the southeastern United States at this time. Zooarchaeological analyses and preliminary floral studies have suggested that Late Archaic coastal sites represent the remains of procurement systems focused on the salt marsh and adjacent maritime forest with no discernible reliance on neighboring riverine environments. Based on these data, the implications of sedentary occupation or use of the area in a pattern of transhumant subsistence is explored.(2)

Mascaro, Jill (Illinois State) THE USE OF "XIPE" AS A PERSONAL NAME IN MIXTEC GENEALOGICAL MANUSCRIPTS. Few deity names were used as personal names in Mixtec genealogical manuscripts. In his article "los Senores de Yanhuitlan," Alfonso Caso suggested that "Xipe" may have been the personal name of the rulers of "Twisted Tree-Hill-Quetzal River." On pages 33b to 35 of Codex Nuttall, seven members of this dynasty wear a red and white headdress and/or a vertical line through the eye, features associated with the god in the Borgia Group manuscripts. However, in Codex Nuttall the face paint and headdress do not seem to function as a personal name. When members of this dynasty are shown in Codices Bodley and Selden or on other pages of Nuttall, they do not have any attributes of the god. On Nuttall 33b to 35, the Xipe features seem to be worn when the members of the dynasty are the progenitors of the next generation, suggesting that the headdress and face paint may indicate who had the right to rule at "Twisted Tree-Hill-Quetzal River." The name "Xipe" apparently cannot be added to the small list of deity names that serve as personal names.(12, 13)

Maslowski, Robert F. (Smithsonian) THE CHRONOLOGICAL POSITION OF THE FRANK M. SETZLER COLLECTION IN TRANS-PECOS PREHISTORY. Re-analysis of materials

from ten sheltered sites indicates an occupation from Early Archaic through Neoindian. The development of various lithic industries is correlated with the evolution of perishable artifacts. Styles of projectile points prove to be good time markers which cross cut Trans-Pecos and several surrounding areas whereas basketry and sandal types are more restricted, hence, more useful in defining cultural groups.(40)

Matheny, Ray T., and Dale L. Berge (Brigham Young) PROBLEMS PERTAINING TO CULTURAL RESOURCE MANAGEMENT. (19)

Matson, R. G. (see Lipe, W. D.)(37)

McArdle, John (Chicago), Richard W. Redding (Michigan), and Melinda A. Zeder (Michigan), APPLICATIONS OF NUMERICAL CODING AND COMPUTER ANALYSIS TO PROBLEMS OF ZOOARCHAEOLOGY. I cannot at this time present you with a formal abstract. The authors must meet and resolve some differences in technique. The paper will be a compromise system based on a series of techniques described in two papers that will appear in the next issue of Paleorient.(24, 25)

McCollough, Major C. R. (Tennessee) THE NOAILLIAN, PERIGORDIAN, AND GRAVETTIAN POPULATIONS OF THE WESTERN PYRENEAN "FUNNEL" AND CANTABRIAN SPAIN. The examination of various Spanish Upper Palaeolithic assemblages, mainly from Cantabrian sites, indicates that the Pyrenean facies of the Noaillian (ex-Perigordian Vc) tool-making tradition recognized by David in France existed also in the Spanish Basque provinces. Evidence of other "Perigordian" or "Gravettian" occupation is essentially absent in this area. The long duration of the Pyrenean Noaillian in France is corroborated by Spanish evidence. The paper also examines relationships between Noaillian and other Upper Palaeolithic traditions in Cantabrian Spain. Some of the data presented may partially explain previous difficulties in attempts to synchronize French and Cantabrian sequences and chronologies.(8)

McKinney, Charles M. (National Park Service) CULTURAL RESOURCE PLANNING IN FEDERAL PROJECT AND LAND MANAGEMENT ACTIVITIES.(19)

McKusick, Marshall (Iowa) THE CHANGING ROLE OF THE STATE ARCHAEOLOGIST. "A History of American Archaeology" (Willey and Sabloff 1974) is primarily concerned with the changing emphases in interpretive stages of development. From another viewpoint equally significant professional changes have been taking place in the past two decades in archaeological objectives, site preservation, and administrative support. The development of historical archaeology is partially shifting the emphasis from the traditional area of aboriginal prehistory. Another area of change is the rapid growth of public archaeology with State and Federal requirements, funding and support administered by State Archaeologists and others. These emerging programs are providing an alternative emphasis for archaeological research.(1)

Meadow, Richard H. (Harvard) FAUNAL SAMPLES AND EXCAVATION IN THE MIDDLE EAST. The realities of excavation on large sites of the Middle East require explicit discussion of recovery and sampling procedures. Such considerations are especially important when dealing with faunal materials. Bones depend for their qualitative validity on the integrity of the excavation unit and for their quantitative validity on the kind of recovery used. Different recovery techniques are appropriate to particular archaeological situations and produce information useful for different types of analysis. For instance, excavation of the non-occupational fill of a room, because of its often uncertain chronological unity, does not justify the use of finer recovery techniques, while floor deposits or midden contexts do require dry screening or wet sieving. Furthermore, while all measurable bones recovered from one time horizon may be a valid sample for osteometric analysis, the relative frequencies of different species can most accurately be determined from screened or wet sieved deposits. The faunal analyst must understand the limitations of his or her sample, be confident of its integrity (or alerted to its lack thereof), and decide how to allocate his or her time in analysis.(24, 25)

Mehringer, Peter J., Jr.(5)

Miksicek, Charles H. (Washington) A PRELIMINARY ANALYSIS OF CARBONIZED MAIZE FROM THE EL MORRO VALLEY. Two models for the distribution of goods in a prehistoric Pueblo Indian society will be tested using data derived from the analysis of carbonized maize cobs from the El Morro Valley in New Mexico. In addition a comparison will be made between the cognitive groupings of the Indian farmer and the analytical groupings of the archaeologist.(20)

Minor, Rick, C. Melvin Aikens (Oregon), and Robert Stuckenrath (Smithsonian) CULTURAL PHASES AND C-14 CHRONOLOGY OF DIRTY SHAME ROCKSHELTER. The cultural content of six stratigraphic zones, dated by 22 C-14 determinations, is summarized in terms of cultural phases named for geographic features in the vicinity of the site: Malheur Phase, 10,000-8000 B.P.; Owyhee Phase, 8000-7000 B.P.; Starvation Spring Phase, 7000-4500 B.P.; Defeat Butte Phase, 4500-2500 B.P.; Antelope



Corrals Phase, 2500-1500 B.P.; McDermitt Phase 1500 B.P.-Historic. Patterns of change and stability in human activity at the site throughout this period are described and their implications for current models of Great Basin prehistory discussed.(17)

Montet-White, Anta (Kansas) THE EASTERN GRAVETTIAN: A CASE STUDY. The paper discusses the applications of techniques of pattern recognition to the analysis of lithic industries. The assemblages from Kadar, a Gravettian camp-site in northern Bosnia, provide the data base for the study. The objectives of the analysis are to identify patterns of tool specialization and to define tool-kits. This research is part of a joint program in collaboration with the Museum of Sarajevo.(8)

Montet-White, Anta (see Brockington, Paul)(3)

Moore, Gary L. (Texas Highway Dept) SCHEDULED HUNTING AND GATHERING IN THE TRANS-PECOS. Recent investigations in the Trans-Pecos region of Texas have resulted in information which supports an hypothesis of scheduled hunting and gathering during the Late Archaic and Late Prehistoric periods. Site distribution and character suggests non-random subsistence patterns which may relate, in nature, to those reported by MacNeish in Mesoamerica. Data are presented regarding winter camps, seasonal migration, Micro-Band sites and the consolidation of possible Micro-Bands into Macro-Bands. Supporting evidence of lithic technology, pollen records and ethnohistoric accounts is included. Based upon these observations, a model for additional research is offered.(22)

Morenon, E. Pierre, (Eastern New Mexico) CHACOAN ROADS AND ADAPTATION: HOW A PREHISTORIC POPULATION CAN DEFINE AND CONTROL ITS SOCIAL AND NATURAL ENVIRONMENT. Survey work focusing on the definition of material remains and settlements associated with the "great north road" from Chaco Canyon to the San Juan River in northwestern New Mexico was conducted in the summer of 1974. Recent studies by The Southwestern Anthropological Research Group have sought to explain why settlements are located where they are by focusing largely on the distribution of known natural resources of assumed importance to prehistoric populations. Roads can be used as direct indicators of connectivity between settlements and direct indicators of natural resources made most accessible to prehistoric populations. The ability for prehistoric populations to increase settlement interaction and resource accessibility directly through the construction of roads suggests how the social and natural environment was both defined and controlled.(20)

Morris, Craig (Brandeis) INFRASTRUCTURE OF THE INCA EXPANSION IN THE CENTRAL HIGHLANDS. Imperial expansion can be sustained only if a framework can be established to support communication, transportation and provincial administration. Recent evidence, particularly from the administrative center at Huanuco Pampa, is beginning to supply many of the details of the Inca infrastructural network in the Central Highlands which provided a physical basis for the economic and political growth of the state. The paper explains some of that evidence and its implications, looking especially at the relationships between urbanization and political developments in the Inca case.(31)

Morris, Don P. (Arizona Archeological Center, NPS) THE STUDY OF PERISHABLE MATERIALS: COSTS AND BENEFITS. Fieldwork at Antelope House, Canyon de Chelly, is critiqued in terms of conservation of archaeological resources. The excavation of this site has yielded one of the largest collections of perishable materials recovered in the United States. Questions concerning the significance of non-artifactual materials, the study and preservation of perishable materials, future research potentials, and relative costs are explored.(9)

Muller, Jon (Southern Illinois, Carbondale) PALEOPSYCHOLOGY OLD AND NEW. This paper examines three models in paleopsychology—the behaviorist, the cognitive, and the introspectional. The relative fruitfulness of competing psychological schools is evaluated in terms of archaeological data and their fit into the premises and methodologies of the schools.(10)

Murra, John V. (Inst for Advanced Study) THE CONQUEST AND ANNEXATION OF QOLLASUYU BY THE INKA STATE. According to dynastic oral tradition, once Cuzaco was safe, king Pachakuti began expanding the Inka realm-of-the-four-quarters to the south, by intervening in the disputes between the several Aymara kingdoms that emerged around Lake Titicaca following the collapse of Tiwanaku. Eventually this area came to be recognized as the richest and most densely populated quarter of Tawantinsuyu. But it has taken us some time to recognize this fact; we need to understand how this wealth came to be generated long before the Inka, in what looks to outsiders like the highest, the most inhospitable part of the Andean world. These specific Andean riches (large herds, preserved-food productivity, weaving energy, large populations) became part of Inka resources when Qollasuyu was annexed. Current arachaeological, ethno-historic and ethnographic research is used to suggest some priorities in Inka and Qollasuyu studies.(31)

Nance, C. Roger (Alabama, Birmingham) EXCAVATIONS AT DURANT BEND: MIDDLE WOODLAND TO PROTOHISTORIC ARCHAEOLOGY IN CENTRAL ALABAMA. A ten week excavation at this central Alabama site led to the definition of five sequential

components. Three, early and late Deptford and Weeden Island I, were superposed below and within a stratified, low platform mound. A Weeden Island II-related component and a final protohistoric component were excavated from separate middens. The site sequence is reported in terms of lithic tool forms and parent materials, ceramic decorative and inferred manufacturing techniques, and faunal resources. Also, regional archaeological studies are utilized in order to relate changes in the Durant Bend sequence to changing prehistoric settlement patterns.(45)

Neff, Jeffrey, (see Harlan, Mark E.)(14)

Nelson, Charles, Barbara Luedtke (Massachusetts, Boston) and David Braun (Michigan) COASTAL ADAPTATIONS IN BOSTON HARBOR. Recent archaeological survey and testing on the islands in Boston Harbor has provided significant information on the coastal resource exploitation activities of the Middle and Late Woodland cultures of southern New England. These sites are typified by a very low density of ceramic and lithic artifacts, but they do provide a wide variety of kinds of information applicable to the study of human adaptation and microenvironmental change. Specific studies have concentrated on pollen and plant remains from the sites, adjacent salt marshes, and non-site areas of the islands, on microscopic molluscs as microenvironmental indicators at sites, on shellfish utilization patterns, and on variations in faunal remains. In addition, the patterning of activities at sites and on the islands as a whole was considered an important aspect of adaptation.(2)

Nemaric, Juan Carlos (New Mexico) THE ROLE OF TAXONOMY IN ARCHAEOLOGY. The reason for this short essay is to present a point of view which we feel would help archaeologists and the continuance of serious scientific endeavors. It is, necessarily, based on the critique of already conceived theory which we feel has no logical consistency nor is empirically demonstrable. The conceived theory as exposed by such archaeologists as Clarke, Chang, Rouse, Watson, LeBlanc, Redman and Dunnell, just to mention some of its latest proponents, specifies that taxonomies are abstracted as natural units, thus with natural unitary values, from whatever is being taxonomized to serve the purpose of classificatory schemes. It is our belief that taxonomies are mere justification for classification which are devised by the archaeologists, from their own cognitive maps to specify the conditions of the meanings given to their experience. Therefore, taxonomies are conventional values given to conventional units. And however we interpret the archaeological record is not helped by any supposed rule of inference abstracted from those taxonomies as instruments for measurement.(44)

Netherly, Patricia (Cornell) THE MANAGEMENT OF LATE ANDEAN IRRIGATION SYSTEMS. Andean irrigation networks on the North Coast and in the Central Highlands of Peru have been studied and described in some detail. However, little has been known of the way in which water was apportioned or the canals maintained in prehispanic times. Analysis of early Spanish colonial irrigation regulations, early litigation over water rights, and contemporary traditional practice show how much of the prehispanic Andean system was retained under the Spanish and what modifications were introduced by the Europeans. Rights to water as well as responsibility for canal maintenance are shown to be vested in social groups under a kuraka or lord rather than in individuals, beginning at the local level and ascending the socio-political hierarchy in the case of the larger and more complex systems. This basic pattern appears to have been used in canal systems constructed or enlarged under the direction of the Chimu and Inca states.(32)

Neuschwander, Ken M. (Utah Power and Light) A VOICE FROM PRIVATE INDUSTRY. The decision-making process of private industry requires close control and coordination during all phases to assure a timely and orderly completion of the project. The advent of federal and state government into the private business decision-making process has created unpredictable delays and confusion.(19)

O'Brien, Patricia J. (Kansas S) CAHOKIA TRACT 15B—THE SOCIAL FUNCTIONS OF NINE ARCHITECTURAL PHASES. Using data on construction methods, axis orientation and house floor area, three single post constructed house types and nine wall trench constructed types have been isolated on Tract 15B. Two superimposed circular enclosures, a chunky yard and a bastioned compound are present. Using stratigraphic data all these structures are ordered into nine architectural periods. Analyses of these data indicate the earliest three periods show lower class residential use of the tract followed by four phases of "public-ceremonial" use followed by a return to residential use albeit higher class. The single post constructed houses are in the first three phases and represent lower class residences. Phases 4 thru 7 show the public structures—first with two superimposed circular enclosures (meeting areas?) which are removed and replaced by a chunky yard which itself is dismantled and replaced with the bastioned compound (thought to be a trader's market). The tract is then leveled and converted back to "private" residential use with the presence of large wall trench houses in the last two phases. While these functional interpreations are tentative, they reveal the diverse functional history of this tract at Cahokia.(45)

Olsen, Stanley J. (Arizona) WHAT BISON IS THAT? For too many years archaeologists who have found bison bones in association with man have assigned them to either Bison bison, Bison antiquus or Bison occidentalis with little or no regard to what criteria were used to establish these species. The type descriptions of these similar animals are discussed and illustrated and their taxonomic and stratigraphic positions are reviewed.(11)



Ortner, D. J. (see Von Endt, D. W.)(44)

Ossa, Paul (Skidmore) A TYPOLOGICAL ANALYSIS OF CHAMFERED PIECES. Chamfered pieces (eclats et lames a chanfrein) from various circum-Mediterranean sites are analyzed from a typological, type attribute, approach. The study delineates the unity and variability of the type, at specific sites and at various sites. Some suggestions are made to account for the remarkable consistency of some attributes of the type. A brief attempt is made at delineating the function of this artifact.(44)

Otteson, Ann I. (Sweetbriar) PREHISTORIC EXCHANGE SYSTEMS IN THE EASTERN UNITED STATES. Prehistoric exchange systems in the eastern United States, focusing on those in the Mississippi, Illinois, Ohio, and Tennessee river valleys during the Early, Middle, and Late Woodland/Mississippian periods, are examined. The analysis of the distribution of certain exotic raw materials indicates the patterns of exchange and changes over time in these patterns.(45)

Otto, John S. (Florida) FROM CAVIAR TO CATS: A COMPARISON OF PLANTER, OVERSEER, AND SLAVE DIETS FROM CANNON'S POINT PLANTATION (1794-1861), ST. SIMON'S ISLAND, GEORGIA. The Southern diet has long fascinated scholars, but studies of antebellum diet have been based on planters' journals and travelers' accounts which are written from the viewpoint of the superordinate class; as a result, little is known about the diet of slaves or middle-class white Southerners, including overseers. Excavation of plantation sites reveals the remains of domestic and wild food animals used by all the inhabitants—planters, overseers, and slaves. In addition to reconstructing their diet, there are theoretical possibilities for hypotheses which can be generated to explain the differences that appear in the zooarchaeological record at sites occupied by representatives of three different social classes. Class differences are apparent in the diversity of wild animal species present, the ratio of wild to domestic animals, the habitats utilized to collect foods, and the attitudes concerning potential food sources.(2)

Parmalee, Paul (11)

Payne, Sebastian (British Inst of Archaeology, Ankara) KILL-OFF PATTERNS AND MAN-ANIMAL RELATIONSHIPS IN SHEEP AND GOATS: COLLECTION AND INTERPRETATION OF DATA. Studies of the ages at which animals were killed can give us valuable evidence for man-animal relationships in the past. The paper describes a method for reconstructing kill-off patterns for sheep and goats using eruption and tooth-wear in the mandible, presents results for a number of sites, and discusses their interpretation. Disadvantages of the method described are (1) that we cannot as yet reliably distinguish sheep and goat mandibles; and (2) little is yet known about variability in the relationship of age to tooth-wear in different breeds and environmental conditions. Advantages of the method are thought to be (1) that results are less affected by poor recovery or by differential preservation than other methods; (2) that the method provides subdivision of the later age-stages, all too often uninformatively grouped together as "adult" or "more than 36 months"; and (3) that the method does not depend on subjective description or judgment, and can therefore provide a dependable basis for comparison between different sites and different workers.(24, 25)

Peebles, Christopher, and James Brown, SOCIETAL VARIABLES.(7)

Phagan, Carl (Ohio S), and Robert K. Vierra (Northwestern) ASSOCIATIONAL PATTERNING IN LITHIC ASSEMBLAGES AND SUBSISTENCE-RELATED BEHAVIORAL STRATEGIES: A PERUVIAN EXAMPLE. Interassemblage variability, as measured by percentages of implement types, is often used to monitor cultural change in the archaeological record. Given this view, the lack of such variability would suggest little or no cultural change. A detailed study of the Puente site in the Ayacucho Valley of the Central Peruvian Andes suggests that this view may be misleading when dealing with certain kinds of logistical and behavioral strategies. The lithic assemblage is analyzed functionally and technologically by attribute and gross typology. Selected elements of the classification systems and their implications for determining cultural input are explained. Faunal and other non-lithic evidence is presented for evaluation and comparison with the lithic data.(3)

Pierson, Lloyd (BLM) RELATIONSHIPS OF THE STATE ARCHAEOLOGIST WITH STATE AND FEDERAL AGENCIES. The Bureau of Land Management will look to the State Archaeologist for coordination and cooperation in all of the state's archeological problems. The State Archaeologist must learn the Federal bureaucracy and legislation and the formal and informal ways and means of cultural resource program accomplishment. State archaeologists are going to have to learn more about historical sites than in the past to cooperate with the Bureau of Land Management.(1)

Pires-Ferreira, Jane (Michigan) EARLY TO MIDDLE FORMATIVE MESOAMERICA: THE REORGANIZATION OF PREHISTORIC EXCHANGE NETWORKS. This paper examines the definition of obsidian and iron ore mirror exchange networks based on Neutron Activation Analysis and Mossbauer Spectral Analysis and changes in these networks from the Early to Middle Formative periods in Mesoamerica. The social and political implications of these changes are discussed.(18)

Plog, Fred T. III (SUNY Binghamton) THE CHEVELON ARCHAEOLOGICAL RESEARCH PROJECT. This paper discusses four years of research in the Chevelon drainage of Arizona. Particular attention is given to two topics: (1) the variety of survey strategies employed in the project, and (2) whether the major differences between the prehistory of Chevelon and nearby regions are a product of different survey methodologies or real differences in the archaeological record.(37)

Plog, Fred T. III (SUNY Binghamton) MODELS OF ECONOMIC EXCHANGE. The paper discusses alternative approaches to the description and explanation of exchange systems. Particular emphasis is placed on models which can be employed in the study of prehistoric exchange systems.(18)

Pohorilenko, Anatole (Tulane) THE USE OF ICONOGRAPHY AND THE QUESTION OF OLMEC DEITIES. A systematic analysis of the Olmec representational system reveals that it is structured in terms of two basic complexes, one material and the other mythological. Variability and distributional analysis of the characters defining the mythological complex indicate that mythological events, human and animal figures and objects related to such events, and symbols that stand for these figures and objects are being represented. Moreover, since no representational consistency of a specific character combination was found, the presence of formalized deities derived from studies of the Olmec representational system is questionable.(43)

Prewitt, Elton R. (Texas-Austin) POST-ARCHAIC MORTUARY PRACTICES AT THE LOEVE-FOX SITE. Recent investigations at the Loeve-Fox site in central Texas have revealed evidence of culturally induced changes in mortuary practices in a Post-Archaic context. Stratigraphic relationships within the site and within a distinct cemetery are discussed. Comparisons with other reported cemetery sites in the immediate region suggest a distinct pattern during a restricted time period.(29)

Price, James (see Hall, Robert)(7)

Price, T. Douglas (Wisconsin) INTER-SITE COMPARISON USING MEASURES OF SPATIAL PATTERNING. A variety of methods have been proposed for the analysis of the patterning of artifacts on Paleolithic occupation floors in an attempt to define associations of various kinds of tools and/or to distinguish areas of activity related to patterns of tool distribution. Most applications of these methods treat only a single site and, perhaps, in part for reason, interpretations of tool associations or activity areas are generally neglected. A number of factors can contribute to the observed distribution of artifacts and in order to be able to interpret artifact patterning we need to control these other sources of variation. A comparison of several separate occupation floors is presented in an attempt to distinguish the relationship among the number of occupants of a site, the duration of occupation, and human activity. Specifically, measures of spatial patterning such as nearest neighbor distance and the index of aggregation are examined in the light of site size and artifact density at a series of Mesolithic sites in the Netherlands.(41)

Pring, Duncan (Cambridge) THE CORAZAL PROJECT: EXCAVATIONS IN NORTHERN BELIZE, 1975. The results of the third field season of the British Museum/Cambridge University project are outlined, with particular interest to the 2000 year ceramic sequence.(39)

Purdy, Barbara A., THERMOLUMINESCENCE DATING: APPLICATION OF THE TECHNIQUE TO HEAT-ALTERED FLORIDA CHERTS. Thermal alteration of flint materials was often practiced by aboriginal craftsmen as one step in the production of chipped stone tools, particularly projectile points. Heating flint materials to facilitate flake removal can be compared to the firing of clays to produce pottery and thus has the potential of yielding absolute dates by the thermoluminescent method. This paper discusses research which has been initiated at the University of Florida to determine the feasibility of using thermoluminescence to date Florida cherts.(3)

Quirarte, Jacinto (Texas-San Antonio) DEFINITION OF SPACE IN MAYA PAINTING. This is a study of space in Maya painting as seen in a select number of codices and cylindrical vases. A determination of the manner in which visual space was articulated in these paintings will help us establish what is unique to this style as opposed to other Mesoamerican styles of painting, such as the Mixtec or Mixteca-Puebla. Specifically, the formats as well as the way in which the formal and thematic structures were established within these formats are analyzed. This includes a discussion of figural poses and proportions, the scale of figures and objects, and their displacement within the narrative scenes. The demands of each surface, its size, and the ultimate function of the paintings are also considered in this discussion.(12, 13)

Rabin, Emily (Instituto de Estudios Oaxaquenos) CALENDRICAL NAMES IN THE MIXTEC HISTORICAL MANUSCRIPTS. Calendrical names of personages in the Mixtec historical manuscripts are analyzed and compared with the calendrical names of the Mexica in the Valley of Mexico as defined by Fray Bernardino de Sahagun in Book IV of the Florentine Codex. A number of anomalies become evident in this comparison and suggest the possibility that different divinatory almanacs or systems may have been in use.(12, 13)



Randall, Nancy (Maryland) and Errett Callahan (Virginia Commonwealth) BIFACE THINNING FLAKES: KEY FACTORS IN ANALYZING PLATFORM ANGLES. An experimental study of optimum platform angles needed for executing maximum biface thinning revealed that relationships exist between certain key factors related to platform specification. Key factors include platform bevel, center plane of biface, striking angle, dorsal surface and ventral surface of flake. When relationships between any two of these factors can be established, it is possible to determine relationships between all of the others, even though their specifics may not be known. The more the knapper is aware of the interrelationships between these variables, the more fully he will be able to control the attributes both of the parent biface and of the removed flakes. Experimentations during the 1974 Pamunkey Project and analysis of flake debitage material from the Flint Run Paleo complex have revealed trends toward favoring late stage biface thinning flakes for functional utilization. It was experimentally determined that the more refined the biface, the more functionally efficient were the flakes; and the more the knapper was aware of the attributes, the more likely he was to obtain functionally efficient flakes. It is hypothesized that knowledge and control of the key factors above was requisite in the past for obtaining optimum flakes for maximum functional utilization. Reconsideration of key platform factors has led to the rejection of the significance of measuring angle beta. Angle theta, on the other hand, is seen as the critical angle of significance.(3)

Rasson, Judith A. (SUNY Binghamton) TRACE ELEMENT ANALYSIS OF OBSIDIAN FROM NEOLITHIC YUGOSLAVIA. Spectroscopic analysis of trace elements from a limited number of obsidian samples from three Yugoslav sites is discussed. The sites date to both the early and late Neolithic. An attempt is made to identify sources of these samples based on previous analyses by Renfrew et al. Brief discussion is offered of some of the chemical problems of analysis as well as the import of the results for regional trade patterns in this period of prehistory.(44)

Ray, Arthur J., Jr. (York) THE SPATIAL STRUCTURE OF THE EARLY FUR TRADE OF CENTRAL AND WESTERN CANADA: SOME IMPLICATIONS FOR ARCHAEOLOGICAL RESEARCH. The economic behavior and specialization of Indian groups involved in the fur trade of the central and western interior of Canada before 1763 are examined, and a spatial model of the fur trade developed. The implications which Indian economic behavior and the spatial structure of the fur trade have for current archaeological research in sub-Arctic and northern Plains areas are then considered. It is posited that the nature of the early fur trade would lead archaeologists to underestimate the importance of the protohistoric period as a time of rapid culture change, and indeed, make it difficult to identify this period archaeologically.(10)

Rayl, Sandra L. (see Hoffman, Charles A., Jr.)(33, 34)

Read, Dwight and Steven A. LeBlanc (UCLA) HYPOTHESIS TESTING AND THE DEDUCTION OF GENERAL LAWS. Hypotheses can be confirmed by empirically testing against the real world; or such laws can be deduced from axioms and definitions. Differences, both of a theoretical and practical nature, between these two means of generating general laws are considered. Examples of how each of these methods has been approached are given.(4)

Reaves, Roy W. III (Natl Park Service) CULTURAL RESOURCE LAWS AND POLICIES: BACKGROUND AND HISTORY. (see Aten, Lawrence E.)(19)

Redding, Richard W. (Michigan) ECOLOGY OF TATERA INDICA (INDIAN GERBIL) AND MERIONES CRASSUS (SUNDEVALL'S JIRD) ON THE SUSIANA PLAIN, SOUTHWESTERN IRAN, WITH APPLICATIONS TO THE MONITORING OF PAST ENVIRONMENTS. Populations of small mammals, particularly rodents, are sensitive to changes in environments. Their distribution is usually closely related to one or more variables of the niche. If the controlling variable(s) for a species is (are) known then the presence of that species in an archaeological context can be utilized to make statements concerning the environment around the site at the time of deposition. Several problems and assumptions are involved in utilizing presence of a species of rodent in monitoring past environments: these are discussed. Preliminary work on determining the controlling variable(s) for two rodent species from southwestern Iran is presented. It appears that the distribution of Tatera indica and Meriones crassus is controlled by the presence of preferred foods in sufficient quantities to support breeding colonies. T. indica utilizes primarily the seeds, leaves, and rhizomes of grasses (Graminae) and M. crassus depends on seeds from legumes that produce indehiscent pods. Using this information several comments based on the presence of T. indica and/or M. crassus about the environment around the site of Ali Kosh during the phases of occupation are made. These statements are supported by data presented by other workers on the plant remains from Ali Kosh and the geomorphological history of the area.(24, 25)

Redding, Richard W. (see McArdle, John)(24, 25)

Redman, Charles L. (SUNY Binghamton) CULTURE CHANGE AND THE INTRODUCTION OF AGRICULTURE. It is generally assumed that major cultural transformations accompanied the introduction of agriculture in the Near East. Regularities such as village

life, pottery, and rectilinear architecture have been noted, but a more detailed investigation promises to produce substantial insights. The architectural and artifactual data from the recent excavations at Cayonu, in southeastern Turkey, are examined from this perspective and compared with general patterns observed at other early village sites.(36)

Redman, Charles L. (see Watson, Patty Jo)(37)

Reher, Charles A. (New Mexico) SETTLEMENT AND SUBSISTENCE ALONG THE LOWER CHACO RIVER: OPERATIONALIZING RESEARCH HYPOTHESES FOR THE REGIONAL SURVEY. An inventory survey of 68.5 $mi^2$ (177.3 $km^2$) along the east side of the lower Chaco River in northwestern New Mexico yielded 716 cultural components, including 3 Paleo-Indian, 99 Archaic, 5 Basketmaker, 191 Anasazi, and 413 Navajo. Recovery of archaeological and environmental data was structured within an explicitly theoretical research design, based chiefly on the SARG problem orientation which views sites as loci of adaptive, maximizing behavior and seeks to explain why sites are located where they are (Gumerman 1971; Plog and Hill 1971). Commonly held archaeological assumptions about the nature of these settlement-subsistence systems were used to deduce which environmental parameters best expressed the location of relevant energy gates on this particular block of land. This, in turn, allowed generation of hypotheses of specific expected relationships between certain site types, site densities, and certain environmental attributes. Procedures used in operationalizing these tests, the results of these tests, and concomitant settlement and environmental data are presented. Successful tests result in quantifiable, explanatory devices, usually in the form of regression formulae, which allow accurate prediction of site densities and locations along the lower Chaco and which should be amenable to research in other areas. They will only prove useful if standardization and comparison is kept at the level of these overriding energetic relationships rather than at the level of a set of arbitrary environmental measures.(37)

Reher, Charles A. (see Broilo, Frank J.)(9)

Reid, J. Jefferson (Arizona) BEHAVIORAL ARCHAEOLOGY: FOUR STRATEGIES. The apparent diversification of current archaeological research has expanded the nature and aims of archaeology, while producing a sense of disorganization as seemingly disparate research interests compete for the attention and affection of modern archaeologists. These research interests are reorganized into a behavioral archaeology composed of four strategies integrated by a circulation of general questions and general laws. The emerging unity of the discipline is emphasized.(4)

Renfrew, Colin (Southampton) MODELS OF TRADE AND SPATIAL DISTRIBUTION: SOME QUESTIONS. What are the spatial correlates of Polanyi's different categories of trade (reciprocal redistributive, central place)? Do they differ from locational patterns generated by stochastic processes (random walk/random flight) or other locational approaches (e.g., gravitational models)? To what extent do spatial patterns of traded objects permit inferences of trade mechanism? New data on the obsidian trade in three regions of the Old World (Near East, Aegean, and West Mediterranean) are presented.(18)

Reyman, Jonathan E. (Illinois S) A NEW MAP OF SUN TEMPLE, MESA VERDE NATIONAL PARK. With the completion of the new map of Sun Temple, we now have the base capability for testing several hypotheses regarding the possible function of the structure. These hypotheses, all of which relate to the adaptive functions of the building in terms of subsistence, are presented and discussed.(20)

Reynolds, William E. (Arizona S) BOUNDARY DEFINITION IN NEAREST NEIGHBOR ANALYSIS: AN ANALYSIS OF THE CONNIE SITE. This paper presents a nearest neighbor analysis of the Connie site, a Basketmaker II site dating around A.D. 300-450, located in the Hay Hallow Valley of northeastern Arizona. The hypothesis tested is that a non-random distribution indicates contemporaneity of pit structures. The site has two behaviorally significant boundaries, a rock wall and the distribution of lithic materials; both were used in two nearest neighbor tests. The results of these tests are discussed in light of the problem of defining a behaviorally significant boundary for the nearest neighbor statistic. Also discussed are the results of an attempt to define intra-site pit structure patterning based on surface features.(41)

Reynolds, William E., and Marvin D. Jeter (Arizona S) AN EVALUATION OF SURFACE SAMPLING INTENSITIES AND DESIGNS. An intensive surface collection from a Hohokam trash mound is used as the data base and standard for evaluation of a variety of sampling designs and intensities. The Kolmogorov-Smirnov two-sample test is used to compare the samples to the known population. Also, population sample data is used to generate computer-drawn contour maps and trend surfaces.(27)

Riley, Thomas J. (see Rothschild, Nan A.)(23)

Robbins, Louise M. (North Carolina-Greensboro) THE INVESTIGATION OF INFANTICIDE IN AN OHIO FORT ANCIENT SITE: A DEMONSTRATION OF ARCHAEOLOGIST/PHYSICAL ANTHROPOLOGIST FIELD SYNERGY. Traditionally archaeologists and physical anthropologists independently studied different aspects of prehistoric



societies, i.e., "artifacts" and "bones." This isolationist approach is changing gradually to an interdisciplinary synergistic approximation, but a dearth of field collaboration among specialists continues. This report focuses on data associated with infanticide that can be retrieved when archaeologists and physical anthropologists work together in the field during excavation of a site. Who the victims are, where they are found, and the burial "ritual" accorded the individuals are discussed. Alternative methodologies for reducing loss of comparable field data are offered.(45)

Robinson, William J. (see Bannister, Bryant)(21)

Robinson, William J. (see Dean, Jeffrey S.)(37)

Rock, James T. (Arizona Archeological Ctr, NPS) THE CANYON DEL MUERTO STUDY. This report outlines and discusses the two objectives that must be considered in order to meet both the needs of management and the desires of the scientific researcher. Management's needs must be met effectively and completely, and this demands that the researcher have a grasp of the practical needs and desires of the administrating agency. Research goals must not be subverted or disregarded in an all out attempt to satisfy management, but must be integrated with practical needs in a complementary fashion. The survey research design discussed here is an attempt at blending purely scientific research objectives with practical, pragmatic management needs.(9)

Rogge, A. E. (Arizona) PROCESSUAL ARCHAEOLOGY AND THE PHILOSOPHY OF SCIENCE: THREE PROBLEMS. It is argued that processual archaeologists in turning to the literature of the philosophy of science to justify new perspectives, have made three fundamental mistakes involving: (1) a misunderstanding of the distinction between induction and deduction; (2) a confusion of Hempel's deductive-nomological (D-N) model of explanation and the hypothetico-deductive (H-D) method of testing hypotheses; and (3) an undue emphasis on universal laws to the exclusion of probabilistic laws and the logic appropriate to their use.(4)(27)

Rose, Martin R. (Arizona S) A SPATIAL APPROACH TO POINT PATTERN DISTRIBUTION CORRELATIONS. The data examined herein is derived from a Paleo-Indian occupation at Coe Lake Playa in the extreme southern portion of south-central New Mexico. A refinement of the technique introduced by Whallon (1974) for the determination of spatial patterning among various functional tool types is based upon the significance of correlations obtained between the types occurring within the boundaries of a "shared area" (Hanson 1974). In the present research the co-occurrence of tool types is examined within areas defined by a grid network system. From this a similarity matrix is generated by the computation of Pearsons product moment correlation coefficients for all of the variables, and to examine the structure and order within the similarity matrix a multivariate statistical technique is adopted. The results obtained are compared and contrasted with previous research of this nature.(41)

Rosendahl, Paul H. (Bernice P. Bishop Museum) CONTRACT ARCHAEOLOGY IN HAWAII. In recent years, the conduct of contract archaeology has become inreasingly important and extensive is the United States. This trend has been strong in Hawaii, but mainland knowledge of contract archaeology in Hawaii appears to be virtually nonexistent. This paper summarizes the development and current condition of contract archaeology in Hawaii. Development from beginnings in the 1950s to well-organized programs of the present is outlined. Discussed are specific legislation and ordinances guiding the practice of contract archaeology in Hawaii, the variety of projects conducted for both governmental and commercial clients, the problems encountered by contract work in Hawaii and the Pacific, the relationship of contract archaeology to archaeological research in Hawaii, and the outlook for the future of contract archaeology in Hawaii.(28)

Rothschild, Nan A. (New York) and Thomas J. Riley (Illinois) INFORMATION ABOUT INFORMATION THEORY IN ARCHAEOLOGY. The origin and development of information theory is described, both in non-anthropological and anthropological contexts. Some problems with its use in archaeology are suggested, most of which arise from over-extensions of the model. Two examples of "safe" usage are proposed, analogous to ecological applications of information theory.(23)

Rovner, Irwin (Western Michigan) THE CYCLICAL RISE AND FALL OF MAYA LITHIC TRADE SPHERES. The general sequences of diagnostic lithic assemblages from the Preclassic through the Postclassic periods have been established for the Yucatan north coast (Dzibilchaltun) and the Central Maya Lowlands (Rio Bec). Comparisons of these sequences to each other and to lithic assemblages from the Peten, Belize, and the Guatemala Highlands indicate patterns of appearance and disappearance of lithic industries, diagnostic stone implements, and distinctive trade lithic materials. In addition to well-known trade in obsidian and basalt, implements made of quartzite, high quality chert, and even limestone were variously employed in intra- and inter-regional trade networks. Two major competing trade spheres are indicated: a Gulf Coast-North and Central Lowlands sphere tied to central Mexico, and a Caribbean Coast-Peten Trans-Highlands sphere. A repetitive pattern of three cycles of rise and fall are indicated: Proto-Classic, Terminal Classic, and Proto-historic.(43)

Rudy, Jack R. (Natl Park Service) DISCUSSION OF CULTURAL RESOURCES FOR PURPOSES OF THE NATIONAL ENVIRONMENTAL POLICY ACT AND THE NATIONAL HISTORIC PRESERVATION ACT (see Aten, Lawrence E.)(19)

Ruppe, Reynold J. (Arizona S) ARCHAEOLOGICAL SITE SURVEY ON THE CONTINENTAL SHELF. It is postulated that a late Pleistocene transgression of the oceans drowned archaeological sites on littorals all over the world. The drowned sites now exist underwater on the continental shelves. Search techniques utilizing recording fathometers, sub-bottom profilers, side scan sonar and divers should be able to locate the drowned sites. Geological dating of various still stands places periods of low sea level at the same time as the movements of early populations in both the New and Old Worlds. The excavation of a specific underwater shell midden is discussed. Critical problems are raised, but final decisions must await further research. Research methods suitable for studies of drowned terrestrial sites on the continental shelves that have been attempted are analyzed and discussed.(38)

Sackett, James R. (UCLA) SOLVIEUX. Solvieux is a vast Upper Palaeolithic open-air station in the Perigord region of southwestern France that since 1967 has been intensively excavated by a joint UCLA-University of Bordeaux project. In addition to furnishing some marked contrasts in lithic industry to regional rockshelter sites, its 13 successive levels possess cobblestone architectural features which often lend striking horizontal patterning to their occupational surfaces. The novelty of these results has been complemented by the development of new sampling and excavation techniques, which contrast to those traditionally employed in this classic region of Stone Age research.(8)

Sadek-Kooros, Hind (Teheran) AGING OF MOUNTAIN SHEEP: CRITERIA OF TOOTH-WEAR, AS COMPARED WITH TOOTH-WEAR OF IRON AGE SHEEP (24, 25)

Salmon, Merrilee (Arizona) PHILOSOPHY OF ARCHAEOLOGICAL CONFIRMATION. This paper examines current understandings among archaeologists as to appropriate scientific procedures for the confirmation of propositions. Archaeological assumptions are understood in terms of schools of thought among philosophers of science.(4)

Saltzman, May (UCLA) IDENTIFICATION OF NATURAL DYES OF PRECOLUMBIAN PERUVIAN TEXTILES. A laboratory has been established in the Institute of Geophysics and Planetary Physics at UCLA to identify the natural dyes used in Precolumbian textiles in Peru using the technique of solution spectrophotometry. The technique requires a set of standard or "known dyes" to use as reference standards. Such a collection of dyeings from indigenous plants was collected in 1970-72 by Barbara Mullins. Samples of the dyed wools have been obtained and solution spectra prepared. The data obtained indicate that it may be possible to prepare dye lists which are characteristic of specific regions and periods of archaeological interest in Peru.(21)

Sampson, C. Garth (Southern Methodist) LATE ACHEULIAN RESEARCH AT CADDINGTON, ENGLAND. A search for the late nineteenth-century discovery of a primary context Acheulian floor was conducted at Caddington during 1973-74. Geomorphological, pedological, and palynological analyses suggest a pondside occupation early in the Eem Interglacial. A complete section of the sinkhole pond was exposed by excavation, with megafauna located in marginal clays. No artifacts were recovered in situ, but the large nineteenth-century collection was analyzed by a flintknapper and searched for micro-wear. Local flint nodule shapes have caused most of the claimed typological peculiarities of the Caddington sample.(8)

Sampson, C. Garth (Southern Methodist) LAKESHORE ADAPTATION AT THE NIGHTFIRE ISLAND SITE, LOWER KLAMATH LAKE. Multidisciplinary research has revealed early occupation of Lower Klamath Lake margin following recovery of the local terrace after the explosion of Mt. Mazama (Crater Lake). Sedimentology, pollen analysis and faunal analysis indicate fluctuations in the lake margin adjacent to the site between 6000 B.C. and A.D. 1400. Changes in artifact design and frequency through time are correlated with shifts in micro-habitat, subsistence strategies, and raw material sources. At least one major break in artifact design-trends through time fails to correlate with environmental shifts, suggesting external cultural influences.(6)

Saunders, A. D.(32)

Saxe, Arthur A., and P. L. Gall (Ohio) ADAPTIVE RADIATION OF STATE SOCIETY: A PREDATORY MODEL. A preliminary model utilizing an ecological approach explores state



socio-cultural systems in the context of predator and parasite adaptation. Emphasis is on the interaction and mutuality between extrasystemic and intrasystemic variables in state formation and maintenance in the ethnographic record. Hypotheses and issues for further exploration are raised.(18)

Saxe, Arthur A. (see Gall, P. L.)(18)

Schaefer, Jerome I. (Arizona Archeology Ctr) POTTERY RECYCLING AND USE-LIFE EXTENSION AT ANTELOPE HOUSE: A BEHAVIORAL CHAIN ANALYSIS. The recycling of scarce resources has become a recent concern of environmentalists. A behavioral chain is used to demonstrate how a Pueblo people recycled pottery through time. This model traces the spatial distribution of cultural materials through a site as a product of patterned behavior. Differential frequencies of recycled pottery types derived from the behavioral chain indicate one way the inhabitants of Antelope House may have adapted to environmental stress. This data also helps to evaluate the behavioral significance of some of the traditional Southwest pottery types.(20)

Schambach, Frank (Southern State) THE ANATOMY OF A FOURTEENTH CENTURY CADDOAN CEREMONIAL CENTER IN SOUTHWEST ARKANSAS. Highlights are given of the complete excavation of both mounds in a small two-mound ceremonial center by the Arkansas Archeological Survey during three three-month field seasons.(45)

Schiffer, Michael B. (Arkansas Archeological Survey) FOUR LAWS IN ARCHAEOLOGY. Confirmation requires something to confirm. Most confirmable archaeological statements have been descriptive rather than lawlike or explanatory. This paper offers some laws or law-like propositions derived from current archaeological models and discusses how they can be tested. It is argued that the search for natural laws is partly completed, and that there are many implied laws in present-day models of prehistoric human behavior.(4)

Schiffer, Michael B., and John H. House (Arkansas Archeological Survey) THE CACHE RIVER ARCHEOLOGICAL PROJECT: AN EXPERIMENT IN CONTRACT ARCHAEOLOGY. The Cache River Archeological Project was an intensive field study carried out by the Arkansas Archeological Survey under contract with the U.S. Army Corps of Engineers to provide archaeological information relative to a proposed channelization project. This paper describes some of the innovations in organization and methods made by the Cache Project to bring contract research up to the high standards of modern archaeology. We show that it is not only desirable and feasible but also necessary to derive research dividends from contract projects.(9)

Schiffer, Michael B. (see House, John H.)(9)

Schreiber, Kathy (SUNY Binghamton) JINCAMOQU: ANOTHER "GREAT ENCLOSURE" FROM MIDDLE HORIZON PERU. During June 1974, investigations were undertaken at the site of Jincamoqo, near the village of Cabana Sur in southern Ayacucho. The site consists of a large rectangular enclosure, a row of 17 circular structures (qollcas), and various other smaller architectural remains. The site was mapped and a systematic surface collection was undertaken; architectural style and ceramic associations indicate that the enclosure is of Middle Horizon date. The work of William H. Isbell has suggested that rural sites in Middle Horizon Peru were incorporated into a redistributional exchange system upon which the Wari empire was based. Further, it has been suggested that the great rectangular enclosures on these sites were used as collection and distribution points for produce moving between the rural areas and the urban centers. Jincamoqo clearly lends credence to this hypothesis in several ways, including functional variation within the enclosure, presence of storage facilities, geographical location, and artifact assemblages at the site.(39)

Schroeder, H. B. (Toronto) EARLY HOLOCENE OCCUPATION IN THE ANTI-LEBANON MOUNTAINS. As part of a general program of prehistoric research in interior Lebanon, archaeologists from the University of Toronto for the past two seasons have focused their activities on the valleys and plateaus of the Anti-Lebanon mountains. This paper reviews the preliminary results of those campaigns. A 1972 site survey in the central highlands of the Anti-Lebanon produced ample evidence of their occupation during the early Holocene. During the 1974 season, intensive excavations were begun in the stratified deposits of Mughara et-Nachcharini, a medium-sized cave located on a high (2000 m) plateau of the Anti-Lebanon near the Syrian border. Nachcharini's two meters of deposit (first tested in 1972) have yielded evidence of Upper Paleolithic occupations as well as a series of well preserved late Natufian/PPNA living floors containing abundant faunal, carbonized botanical, and lithic remains.(36)

Scott, Stuart D. (SUNY Buffalo) HUMAN PALEO-ECOLOGY IN THE MARISMAS: A MARGINAL MESOAMERICAN CULTURE. Since 1968, the State University of New York has conducted research aimed at exposition of man's occupancy of an estuarine complex known as the Marismas Nacionales, on Mexico's west coast. This area of the coastal plain of northwestern Mexico was evidently more densely populated by man in protohistoric and possbily prehistoric periods than at present. Their subsistence pattern, highly dependent on a marine diet, manifests itself in large accumulations of shell. This paper presents the results of two tasks. First, a summary of the regional coastal culture-history, currently under study; and second, an attempt to isolate characteristics of the prehistoric natural and social environments in the Marismas for the measure and definition of culture change in this marginal zone of Mesoamerica.(2)

Sears, W. H. (Florida Atlantic) A SYNTHESIS OF BAHAMAS PREHISTORY BASED ON RECENT SURVEYS AND EXCAVATIONS. Surface survey of the Central Bahamas, supplemented by test-pit excavations on two islands, have now given us a reasonable data base for outlining the prehistory of the entire group. Distribution and depth of deposit of sites with the extremely uniform ceramic complex suggests that settlement was from the eastern part of Hispaniola. It proceeded along the easternmost islands, starting well after 1000 B.C., and had reached certain islands visited by Columbus in 1492 shortly before his arrival. Because of its lateness, and interruption by Europeans, major islands and island groups to the east and north were never settled at all.(39)

Shafer, Harry J. (Texas A&M) ART AND TERRITORIALITY IN THE LOWER PECOS ARCHAIC. A prehistoric territorial range is hypothesized for the Lower Pecos Archaic populations based on the geographic distribution of the distinctive Pecos River style pictographic art. The hypothesis is tested by examining the distribution of other art forms and artifact styles. The proposed territory, which includes portions of the well watered canyons of the Pecos, Rio Grande and Devil's rivers, is used to examine both Taylor's concept of tethered nomadism and conservatism of the Lower Pecos Archaic.(22)

Shane, Orrin C. III (Kent) and Michael Barber (William & Mary) ANALYSIS OF THE VERTEBRATE FAUNA FROM THE INCINERATOR SITE AND ITS IMPLICATIONS FOR FORT ANCIENT SETTLEMENT PATTERNING. Analysis of vertebrate faunal remains from a thirteenth century Anderson Phase Fort Ancient village in Montgomery County, Ohio, reveals that the site was occupied perennially by 100-200 persons subsisting on summer agricultural foods and meat from vertebrate species taken throughout the year. Ninety-two percent of all meat was provided by four species (deer, elk, raccoon, and turkey), and there is evidence that turkey was domesticated or controlled in a semi-domesticated state. The pattern of animal exploitation at Incinerator is duplicated at other Fort Ancient sites, suggesting that perennially occupied villages are a major site type in the Ohio Fort Ancient settlement system.(45)

Sheets, Payson D. (Colorado) SOUTHERN MESOAMERICA. Lithic analyses conducted during the past few decades in southern Mesoamerica may be categorized and evaluated by considering their primary objectives: descriptive simplification, chronology, style, function, or technology. The first three objectives predominate in earlier lithic analyses, while a shift toward the latter two can be discerned within the last decade. The past decade has also seen the proliferation of analyses of portions of the manufacturing continuum (quarrying, workshops, the domestic mode of production) or topical analyses such as exchange systems. These recent analyses have been facilitated by techniques such as obsidian hydration or trace element analyses. The integrated combination of topical analyses with new techniques, when founded on a firm theoretical base, should yield far more satisfactory conclusions about what the Precolumbian Maya were doing, and why they did it, than past analyses have been able to achieve.(42)

Shiner, Joel L. (Southern Methodist) EARLY MAN AND THE CONTINENTAL SHELF. Cultural surveys of the Gulf of Mexico Oil Leases have produced a considerable amount of geomorphological data relating to the positions of land and sea during the late Pleistocene. Streamcut channels have been recorded at over 155 feet below present sea level. On the other hand, extensive coral barrier reefs (now dead) indicate a relatively stable shore-lagoon-reef system at approximately 190 feet below present sea level. Early man sites may be no deeper than the interval between 155 and perhaps 180 or 185 feet. Dating of these geological phenomena is not certain, but they are sharply defined, indicating no great antiquity.(38)

Shutler, Richard, Jr., and Duane C. Anderson (Iowa) THE CHEROKEE SEWER SITE—A BISON KILL SITE IN NORTHWESTERN IOWA. Three cultural horizons were discovered during salvage excavations in an alluvial fan at the Cherokee Sewer site (13CK405) in northeastern Iowa during the summer of 1973. The two upper horizons, radiocarbon dated



6000 and 7400 B.P., represent Archaic components, while the third, dated 8570 B.P., is a late Paleo-Indian occupation. The two upper levels are interpreted as camps, presumably associated with nearby bison kills, while the third appears to be a bison kill. The three horizons are separated by a minimum of two meters of sterile deposit. Results of the research on the materials recovered will be presented along with comments on cultural adaptation, environment, and the evidence for climatic change.(33, 34)

Sidrys, Raymond (UCLA) A SECOND ROUND STRUCTURE FROM NORTHERN BELIZE. A large Late Preclassic round structure (10.9 m in diameter, 1.8 m in height) was found at Chan Chen, Belize, only 17 km northeast of a previously reported round structure. The Chan Chen structure has a unique semi-circular arrangement of 45 small stones set into the plastered surface. The presence of a ceremonially "killed" gutter spout beaker on the floor and the intentional burial of the structure by several tons of large boulders suggests a ceremonial function for the round structure.(39)

Sidrys, Raymond (see Andreson, John M.)(43)

Simmons, Alan H. (Southern Methodist) BUY THE SPIRIT BUT DON'T TAKE THE BONE: A CASE STUDY OF ARCHAEOLOGICAL ETHICS. A discussion of the relationship between archaeological research and native peoples is presented in the form of a case study in the Canadian Arctic. Archaeologists have frequently felt immune from ethical considerations (vis-a-vis native groups) in their work, and it is concluded that such an isolation is unwarranted and undesirable. Native claims to archaeological resources are shown, at least in some instances, to have an economic foundation as well as a moral one. It is suggested that native peoples' interests with archaeological remains should be considered from the conception of a project and that these interests are not necessarily incompatible with field implementation.(28)

Singer, Clay A., and Jonathon E. Ericson (UCLA) QUARRY ANALYSIS. Recent studies on prehistoric exchange systems have emphasized the consumption and distribution of traded lithic materials. However, the role of lithic production within prehistoric exchange systems is not usually examined in detail. Indeed, production as well as consumption and distribution are vital to our further understanding of prehistoric exchange processes. This paper examines the production of obsidian products in an extensive quarry area located at Bodie Hills, California, which served as an obsidian source beginning, at least, with the Windmiller complex. During its operation the Bodie Hills quarry served as the main obsidian source of the northernmost exchange system, one of two bifurcating systems originating from Mono Lake. The details of our quarry analysis procedure involve debitage quantification along random transects, computer density-contour mapping, debitage/product ratios, and obsidian hydration measurements for chronological control. The processes of lithic production are described within the spacetime framework. Our analytical techniques have provided a means for estimating the production rates and material end-products for distribution within this prehistoric exchange system.(3)

Singer, Ronald (see Gladfelter, Bruce G.)(8)

Smith, Brent W. (Houston, Texas) PREHISTORIC SETTLEMENT PATTERNS OF THE YOUNG'S BAYOU DRAINAGE, NATCHITOCHES PARISH, LOUISIANA. The purpose of this research is to determine the extent and form of prehistoric settlement in the Young's Bayou drainage in Natchitoches Parish, Louisiana. A model of the contemporary ecology was constructed through the survey of floral and faunal resources in local microenvironments. This contemporary ecological model was correlated with evidences of prehistoric technological exploitation from nine sites. Data from these sites were gathered through surface survey at eight sites and through excavations at the Young's Bayou site. An intersite analysis through the horizontal plotting of artifacts was done for the Young's Bayou site in order to delineate the parameters of the site and to delineate activity areas. A local relative chronology was constructed for the Young's Bayou area through the method of artifact cross-dating. This culture history framework was utilized in the development of a settlement pattern sequence for the area. A change in population density and distribution from the Lithic stage through the Post-Formative stage was demonstrated. A semi-sedentary wandering pattern was modeled for the Archaic.(45)

Smith, Bruce (see Larson, Lewis H.)(7)

Smith, Jack E., and David A. Breternitz (Colorado) ARCHAEOLOGICAL SITES ON PUBLIC LANDS, SOUTHWESTERN COLORADO. Currently, we have record of approximately 6250 prehistoric sites in southwestern Colorado—within Mesa Verde National Park, Montezuma, Dolores, and La Plata Counties. The majority are recorded from public lands. Documented sites range in time from "Archaic" (ca. 5000 B.C.?) to Historic (1800-1900s). Most sites fall between the time span of ca. 550 to 1250, Basketmaker III to Pueblo III. Site location and density show definite distributional preferences, from time to time. Climatic, local environmental, and cultural factors obviously contribute to the overall picture of prehistoric occupation.(37)

Smith, Jason W. (California S-Fullerton) THE NORTHEAST ASIAN-NORTHWEST AMERICAN MICROBLADE TRADITION (NANAMT): A SYNOPSIS. In 1935, N. C. Nelson raised the possibility of a prehistoric Trans-Beringian migration. His hypothesis was

unique in that it was based upon specific artifactual evidence. New data from northern British Columbia and comparative technotypological analysis of microblade core production provide additional support for Nelson's hypothesis. It is possible to recognize a Northeast Asian-Northwest American Microblade Tradition and to define several subtraditions. The distribution of NANAMT manifestations through space and time indicates the spread of the tradition from its presumed origin in southern Siberia/northern China to other parts of Asia and across Beringia to the New World. The "spread" of the culture complex may have been brought about through diffusion, migration, or both. In evolutionary terms, it seems to be the Advanced Palaeolithic-Mesolithic northeast Asian equivalent of southwest Asia's microlithic industries.(28)

Sneed, Paul (see Lipe, W. D.)(37)

Spence, Michael W. (see Squire, Chris)(44)

Squire, Chris, and Michael W. Spence (Western Ontario) MICRO-ANALYSIS OF OBSIDIAN END SCRAPERS FROM JALISCO, MEXICO. The results of microscopic analysis of wear traces on a series of end scrapers from Jalisco, Mexico, are presented. Functional categories are defined, and their distribution in time and space within the sample is discussed.(44)

Stamps, Richard B. (Oakland) WAS THERE SLASH AND BURN AGRICULTURE IN CENTRAL TAIWAN AT 9000 B.C.? Matsuo Tsukada in 1966 suggested that the destruction of primeval forests around 9000 B.C. at Jihyehtan in central Taiwan was probably caused by human activities. K. C. Chang (1969) hypothesized that this destruction of the forests may have been caused by Cordmarked pottery peoples shifting from a hunting and gathering subsistence to a swidden type of root and fruit agriculture. Fieldwork by the author in 1972-73 was undertaken (1) to gather more pollen to better understand the suggested shift in vegetation, (2) to locate archaeological remains that might also reflect a shift from hunting and gathering to swidden agriculture, and (3) Cordmarked pottery in association with the change in vegetation. Confirming results were not forthcoming, the 9000 B.C. vegetational shift and related Cordmarked pottery associations are questioned. (28)

Stanislawski, Michael B. (California S-Hayward) ASK THE ONE WHO MADE IT: HOPI-TEWA ETHNOARCHAEOLOGY. Regardless of the theoretical models utilized in explanation, analogy and inference are still basic problem areas for all archaeologists. Testable hypotheses should be based on what we, as anthropologists, know of the real world; and this means archaeologists and ethnographers must work to build general models illustrating the relationships of human groups, tools, and the environment. My Hopi-Tewa ethnoarchaeology project has been directed toward understanding the relationships of Hopi and Hopi-Tewa individuals, corporate and non-corporate social groups, village, and tribal units and ceramic technology systems of the past and present. Specific conclusions presented include: settlement patterns and social group relationships; how sites are formed and artifacts recycled over generations; networks of information on pottery technology and use of identification marks on pottery; typologies for the archaeologist and Native; history of ceramic typology during the past 100 years, with emphasis on Nampeyo's influence on Hopi Mesa pottery traditions.(10)

Stein, Pat H. (Proyecto Arqueologico-Huanuco Pampa) THE INCA'S HOSPITALITY: FOOD PROCESSING AND DISTRIBUTION AT HUANUCO VIEJO. Andean patterns of reciprocity and redistribution—socio-economic patterns which were extensively utilized by the Inca empire—may also have guided the spatial plan of an administrative city. Two plazas defined by kallanka-like structures dominate the main access leading from the central plaza and ushnu to the palatial compounds at Huanuco Viejo. Material from recent excavations strongly suggests that these structures functioned as centers of food processing and distribution. This presentation examines some of the architectural and artifactual evidence for kitchens and dining halls in this eastern sector of the imperial city.(31)

Stephenson, Robert L. (South Carolina) RELATIONSHIPS OF THE STATE ARCHAEOLOGIST WITH PROFESSIONAL ARCHAEOLOGISTS. The specific role of the State Archaeologist, in relation to other archaeologists in his state, needs to be defined with some sort of inter-state uniformity. Should he serve as a coordinator? Is he responsible for EIS evaluations and Moss-Bennett coordination? Should he be the arbiter in accreditation matters and questions of professional standards? His role is changing and it should be changing to a more systematic role out of the heterogeneous mass of roles that it presently has.(1)

Stephenson, Robert L. (South Carolina) A HAUNTING SHADOW IN THE SOUTHEAST. Early Man in the Southeast is but an ethereal shadow over the face of the land. We know he is here but we cannot really see him or touch him. There are abundant index artifacts but few clearly defined sites and fewer sites that have been exploited. Williams and Stoltman reviewed the situation quite well a decade ago and only small increments of data have been added since. A fresh approach may be indicated. Instead of pursuing the elusive fluted point or "Paleo-point," we should look to environmental data, and from that, prepare some predictive models. Sea level fluctuations, climate, chemical and mineral content of river valleys, depositional and erosional changes, and ecotone changes, among other things,



should be considered in preparing the predictive models. The early work of people like Antevs or Bryan in the southwest can provide guidelines. Some of the newer methods of selectivity and predictability should then be applied to these guidelines. On this basis we could then search out Early Man sites of significance and not to have to rely upon the fortuitous "find" of an occasional index artifact. The "hunt and peck" recording of fortuitous "Paleo-points" in an area of heavy vegetation and depositional "smoothing" of the landscape has been exploited to just about its maximum with little to show for the effort. Let us now introduce a systematic plan of attack on the problem. I suggest that we might begin along the coast with a thorough study of sea level changes.(33, 34)

Stix, A. I. (see Von Endt, D. W.)(44)

Story, Dee Ann, and S. Valastro, Jr. (Texas-Austin) RADIOCARBON DATING AND THE GEORGE C. DAVIS SITE. The chronologic placement of the Davis site, a prehistoric Caddoan settlement in east Texas, has been disputed since 1949 when A.D. Krieger hypothesized that it represented an early Mississippian manifestation, possibly dating to about A.D. 500. Re-investigation of the site has yielded 76 radiocarbon determinations which clearly establish the Caddoan occupation as spanning A.D. 800-1260. Not only is Davis now securely dated, but the large number of samples run provide a valuable case history.(44)

Stothert, Karen E. (Fordham) CONTINUITIES IN THE EARLY LITHIC TRADITION OF NORTHWESTERN SOUTH AMERICA. On the basis of the differences between the lithic technology of the early cultures of the Intermediate Area and the lithic technology of adjacent areas such as Peru, I have defined a Northwestern South American Lithic Tradition (Stothert 1974b). The preceramic and formative peoples of the Intermediate Area that are parts of this tradition manufactured technologically simple flakes and modified them by retouch to a small degree. Using a method for the technological analysis of populations of simple flakes I describe the relationships among the lithic technologies of the preceramic stage of Northwestern South America. The lithic assemblages analyzed include ones from the El Abra Rock Shelter, Colombia; the Vegas and Achallan sites of the Sta. Elena Peninsula, Ecuador; the Siches and Hondo sites of northern coastal Peru; and from Huaca Prieta, Chicama Valley, coastal Peru.(3)

Stoutamire, James W. (Missouri) TREND SURFACE ANALYSIS AS APPLIED TO SURFACE SURVEY DATA FROM TULA, MEXICO. Archaeological survey is primarily oriented toward producing information on the distribution of artifact densities over a site. The two most common methods of producing maps of artifact densities are hand drawing and the SYMAP computer technique. Trend surface analysis, a multiple regression technique, provides a third alternative. This technique has been applied to probability and non-probability sample data collected in the urban zone of the Toltec capital of Tula, Hidalgo, Mexico. Maps produced by this technique have been used to estimate the population of that site during the four major phases of its occupation and to locate lithic workshops within the urban zone.(44)

Stuckenrath, R. (Smithsonian), J. M. Adovasio, J. D. Gunn, and J. Donahue (Pittsburgh) EXCAVATIONS AT MEADOWCROFT ROCKSHELTER (36WH297), 1973-74: A PROGRESS REPORT. Meadowcroft Rockshelter is a deeply stratified, multi-component site in Washington County, Pennsylvania, which has yielded well-dated evidence of more or less continuous utilization from ca. 13,000 B.C. to the Historic period. The stratigraphy, radiocarbon column, artifactual and non-artifactual assemblages are summarized, and the site is compared to others in eastern North America.(33, 34)

Stuckenrath, Robert (see Minor, Rick)(17)

Sullivan, Alan (Arizona State Museum) ARCHAEOLOGICAL RESOURCE MANAGEMENT AND CLIENT INFORMATION DEMANDS: EFFICIENCY ESTIMATES INVOLVING THE SELGEM SYSTEM. Recent federal, state, and local legislation related to the disposition of cultural remains has posed new problems in archaeological resource management. In attempting to cope with increased information demands from all levels of government and industry, the Arizona State Museum has initiated feasibility studies regarding the computerization of site survey data using the SELGEM system. The results of these preliminary efforts are discussed, focusing on how annotation class definitions and SELGEM program capabilities operate within a framework of resource management efficiency related to client information loads and requirements. Mention is made also of the potential contributions the ASM computerization program may make in approaching the formulation and tentative solution of general non-management related archaeological questions.(9)

Tainter, Joseph A. (Northwestern) THE MEASUREMENT OF ORGANIZATION IN PREHISTORIC SOCIAL SYSTEMS. Aspects of information theory are introduced and discussed as an approach toward quantitatively measuring, on a ratio scale, the organization of prehistoric social systems. The relationships between organization, and patterns of interaction among the components of a system, are utilized to demonstrate the existence of methods for quantifying both the amount and the degree of organization in structurally

distinctive systems. This approach is illustrated through the application of information-theoretic measures to an enduring research problem in Midwestern prehistory: the nature of social change from the Middle to Late Woodland periods.(23)

Tartaglia, Louis James (UCLA) SUBSISTENCE STRATEGIES IN SOUTHERN CALIFORNIA PREHISTORY. Prehistoric subsistence strategies were reconstructed based on a seasonal hunting and gathering pattern in several Southern California sites. An environmental systems approach, involving microanalysis of selected shell middens, was employed. Quantitative analysis of midden components indicated which ecosystems within a given environmental system were most extensively exploited. Furthermore, faunal and floral remains proved to be excellent seasonal indicators at these respective sites.(14)

Taylor, R. E. (California-Riverside) DATING CHIPPED LITHIC MATERIALS BY FLUORINE DIFFUSION PROFILES. A nuclear reaction $^{19}F(p,\alpha\gamma)^{16}O$ has been used to measure the depth distribution of fluorine in a series of chipped stone samples from Egypt and the Sinai region of the Near East, from Western Europe, and from California. The data suggest a general increase in the fluorine depth as the estimated age increases. A report on the method of measurement, studies to determine factors influencing the diffusion rates, and the results of measurements on samples from Olduvai Gorge, Tanzania, are presented.(21)

Thomas, Ronald A. (Delaware Archaeology Supervisor) DELAWARE'S DEVELOPMENT PROJECT WATCHDOG SURVEY. Every state agency in Delaware sends notices to the Archaeology Supervisor. Upon receipt of a notice of a new project, a file search is conducted and the agency is notified of their archaeological responsibilities. Permission is then requested to initiate a field survey which is either done by SOA staff or by contract. Reports are then evaluated by the Archaeology Supervisor to see that professional standards are met.(1)

Thornton, Barrie M. (Arizona Archeological Center) UTILITY CERAMICS ANALYSIS: APPROACHING BEHAVIOR AND ORGANIZATION. Much work in the Southwest has related variability in painted ceramics to variability in behavior and organization. No work has been done on undecorated ceramics. This paper presents results of research on undecorated, utility ceramics at Antelope House, Canyon del Muerto. Attributes of ceramic production are utilized in constructing various grouping strategies whereby interpretations are made of spatial distributions of groups in terms of behavior and organization variability. Some southwestern pottery types are evaluated in light of this research.(20)

Torrence, Robin (New Mexico) THE SOURCE FOR AEGEAN OBSIDIAN TRADE: STA NYCHIA QUARRY AND WORKSHOP. Preliminary results of mapping and systematic sampling at the extensive obsidian quarry and workshop site of Sta Nychia on the island of Melos in the Aegean are reported. The fact that Sta Nychia was a major source for obsidian used throughout the Aegean area from Mesolithic to Bronze Age times justifies an intensive study of the production processes at the quarry as they relate to raw material constraints, consumer demand at sites both near and distant, and to possible entrepreneurial activities. Three types of obsidian outcrop, which occur at 22 localities, were used differentially. Several workshop activities, often spatially distinct, are also described.(44)

Troike, Nancy P. (Texas-Austin) THE MEANINGS OF GESTURES IN THE MIXTEC CODICES. Human figures in the Mixtec codices appear to display a wide variety of hand gestures, but a study of these manuscripts shows that not only is the range of these hand positions quite limited, but also that only specific types of gestures occur under certain sets of circumstances. This indicates that these gestures are intended to be informative, and a further analysis reveals that each of them carries a precise meaning.(12, 13)

Trombold, Charles Dickson (Southern Illinois) PREHISTORIC ROAD SYSTEMS ON THE NORTHERN MESOAMERICAN FRONTIER: AN APPLICATION OF LOCATIONAL AND NETWORK ANALYSIS TO THE AREA AROUND LA QUEMADA, ZACATECAS, MEXICO. The relationship between hierarchically ordered sites and prehispanic roadways first described in 1833 by Charles De Berghes is analyzed in terms of Christallers marketing and transport principles. This analysis is designed to serve the following functions: (1) to provide a model to explain interaction between a series of hierarchically nested nodes and cells; (2) to provide a plausible explanation for the function of the roads; and (3) to offer a basis on which to test propositions on the basic political and economic nature of the centrally located fortress-ceremonial center of La Quemada.(43)

Trott, J. James, and Claudia Chang (Museum of Northern Arizona) A STUDY OF SEASONALITY IN THE ROUGH ROCK AREA, ARIZONA. One aspect in the study of prehistoric economic systems involves examination of the seasonal occupation of archaeological sites. The primary basis on which seasonality has been defined is the study of floral and faunal remains. Analysis of artifactual assemblages, architectural remains, and settlement pattern may facilitate the definition of seasonal sites for the Kayenta area. A preliminary model for defining seasonal occupation of prehistoric Anasazi sites is presented in this paper. Research is based on several excavated sites in the Rough Rock area of the Navajo Reservation, current archaeological finds in surrounding areas, and ethnographic accounts of seasonal subsistence cycles of the Hopi and other Southwestern culture groups.(20)



Trotti, Wyman W. (see Hally, David J.)(45)

Tuggle, H. David (Hawaii) RETURN TO FUNDAMENTALS IN METHODOLOGICAL ISSUES. Whether we are concerned with culture history or culture process, the question is what kinds of statements can we make. This is a call for the need to return to a concern for the kinds of statements that can be validly made. Beyond that, the question is how to obtain confidence in the statements. This paper presents a consideration of some dimensions of the basic logic involved in gaining archaeological confidence.(4)

Turnbull, Priscilla (Field Museum of Natural History) FIELD TECHNIQUES FOR SALVAGING BONE ON PREHISTORIC SITES IN THE MIDDLE EAST. Bone at many Middle East sites is poorly preserved for study. Field collecting techniques must be adapted to deal with fragile bone that may have been subjected to periodic flooding, standing water, fire, and wind. Usually the processes of fossilation by mineral replacement of organic molecules have not advanced sufficiently to harden bone during the few thousand years available. The problem is further complicated because many Middle East sites are in humid areas, even though rainfall may be sparse, and many materials, such as shellac, will not dry. Experience has shown that initial treatment of bone is most important. If fragile fragmentary teeth and bone are handled roughly, tossed casually into collecting bags without wrapping, the result will be useless heaps of powdered bone and broken tooth lophs. A fraction of the breaks may be repaired, but much will be lost beyond a notation "large bovid" of "small artiodactyl" on faunal lists. Qualitative results are, even today, of prime importance to understanding early environments; to identify as much bone as possible it is necessary to collect with skill and care.(24, 25)

Uerpmann, Hans-Peter (Institut fur Urgeschichte der Universitat) THE USE OF OLD COLLECTIONS IN MODERN FAUNAL ANALYSIS. The special situation of zooarchaeology in the Middle East forces us to deal exhaustively with all available faunistic remains from that region. The use that can be made of bone finds excavated without particular care for the purposes of faunal analysis depends on the intention and intensity of selection by the excavators. Various types of selection can be realized: (1) selection of well preserved bones; (2) selection of teeth; (3) selection of worked bones. Independent of degree and intention of selection old collections can be used for paleozoological purposes. The importance of this point must be stressed because there exists almost no paleozoological base for faunal analysis in the Middle East. In this context the question of dating old collections arises. The zoological data of old collections is favorable to be stored in Data Banks. For quantitative analysis, old collections are only useful under special circumstances.(24, 25)

Valastro, S., Jr., and Robert L. Folk (Texas-Austin) C-14 MORTAR DATING AT STOBI, YUGOSLOVIA: A NEW TECHNIQUE. The purpose of this paper is to describe a new technique employed in the radiocarbon dating of mortar samples and to present some of the results obtained from a limited number of archaeological specimens available from the Roman ruins of Stobi in southern Yugoslavia.(44)

Valastro, S., Jr. (see Story, Dee Ann)(44)

Varner, Dudley M. (California S-Fresno) SETTLEMENT PROCESSES IN THE ETLA ARM, VALLEY OF OAXACA, MEXICO. An archaeological survey of settlement patterns was begun in the Valley of Oaxaca, Mexico. The northwestern or Etla Arm was surveyed intensively and completely, field by field, to locate all prehispanic sites and to study their relationships to each other as well as to environmental features. Sites were mapped on large-scale air photographs. Density and distribution of artifacts, primarily ceramic sherds, were used to estimate site sizes and population ranges during each cultural phase. Relevant historical and ethnographical data demonstrate a degree of cultural continuity sufficient to base past population profiles partly on those of the present.(43)

Vehik, Rain (Wisconsin-LaCrosse) PRELIMINARY RESULTS OF ARCHAEOLOGICAL INVESTIGATIONS IN SOUTH-CENTRAL NORTH DAKOTA. Archaeological survey along the James River valley south of Jamestown, North Dakota, resulted in the recording of nine tipi ring sites, 20 rock cairns, 22 camp sites, and 32 mounds during the summer of 1974. This paper deals with the methods utilized in the survey. Special emphasis is placed on the mounds which appear to be burial tumuli. The majority are circular, domed mounds, which are similar to other excavated mounds in North and South Dakota and Minnesota. Several are linear mounds resembling the Kropp mound complex, near Jamestown, North Dakota, which has been dated at about A.D. 1000.(40)

Vehik, Susan (Wisconsin-LaCrosse) AN ASSESSMENT OF THE ANCESTRAL RELATIONS OF THE GREAT BEND ASPECT. A series of ceramic and non-ceramic attributes are used to investigate some previously suggested origins for the Great Bend aspect in south central Kansas. The analytic units consist of sites rather than foci and aspect level groups. Similarity among sites was assessed using multivariate statistics. Results indicate that the Great Bend aspect may have resulted from either an indigenous development or a northward migration of certain groups located in central and northeastern Oklahoma.(40)

Veltre, Douglas W. (Connecticut) ARCHAEOLOGICAL SURVEY OF ATKA ISLAND, ALEUTIAN ISLANDS, ALASKA: 1974. Two months were spent during the summer of 1974 collecting archaeological and ethnographic information on Atka Island, Alaska. Previous archaeological research on Atka was confined largely to the work of Jochelson in 1909 and Hrdlicka in the late 1930s, both of whom excavated and saw only a very small number of sites on the island. Based on the work of those individuals as well as on the linguistic work by Bergsland and the coastal survey of portions of the island by McCartney, the 1974 research attempted to gain insight into the number and nature of sites on the northern and eastern portion of the island as well as on the western tip of Amlia Island. This research is anticipatory of research planned for 1975 which will focus at the excavation of a single site from the historic (Russian) period on Atka.(28)

Verner, Roy (National Forest Service) PROBLEMS IN RESOURCE MANAGEMENT. Resource managers face numerous problems from the implications of the National Historic Preservation Act, Executive Order 11593. These may include the lack of basic inventory, funding needed to get the inventory data, and readily available professional assistance. Programs and projects may be delayed, modified, or abandoned. The manager is faced with a new discipline whose members are basically research oriented and unfamiliar with Forest Service land management techniques and objectives. Archaeology itself is a new resource which the land manager must consider in his programs.(19)

Vierra, Robert K. (Northwestern) SPATIAL ANALYSIS AND DATA REDUCTION STRATEGIES. The purpose of this paper is to present a spatial analysis method for isolating discrete activity areas in the archaeological record. Occupational floors characterized by high-density debris (seemingly no discrete partitioning of activity space) can be dealt with by employing various data reduction strategies in conjunction with a factor analysis model. An attempt is made to understand space partitioning, or the lack of it, in terms of underlying behavioral dynamics.(41)

Vierra, Robert K. (see Phagan, Carl)(3)

Vivian, R. Gwinn (Arizona State Museum) STUDENT TRAINING IN CULTURAL RESOURCE MANAGEMENT. The increase in contract archaeology that will be stimulated by the enactment of the Archeological Conservation Bill will provide more employment opportunities for archaeologists. The nature of current contract archaeology is such, however, that curriculum in most departments of anthropology is not sufficient for training in the specialized field of cultural resource management. This problem cannot be solved by resorting to "salvage archaeology" but must be considered through a curriculum that emphasizes conservation needs, administrative requirements, and high quality research and report writing. The development of such a program at the University of Arizona is discussed.(9)

Von Endt, D. W. (Smithsonian), E. P. Hare (Carnegie Inst of Washington), D. J. Ortner (Smithsonian), and A. I. Stix (Smithsonian), AMINO ACID ISOMERIZATION RATES AND THEIR USE IN DATING ARCHAEOLOGICAL BONE. In 1968 Hare and Abelson published data which showed that the amino acids derived from fossil shell protein had isomerized through time. In addition, they showed that the isomerization reaction rates were temperature dependent and could be used to date these shells. Bada et al. (73, 74) have recently extended this technique to include the dating of fossil hominid bone protein. These authors assume that amino acid isomerization rates are primarily temperature dependent and assign a minor role to the effect of other environmental variables such as the amount and pH of ground water. Bada et al. control for these minor effects by "calibrating" their sample with C-14 dates on coeval materials. Our experiments show that diffusion phenomena are important in regulating the amount and type of amino acids remaining in ancient bone, that species and size differences are important in this respect, and that the pH of the surrounding water affects the isomerization rate of amino acids. Our data suggest that dates derived from rates which do not account for these variables may be very misleading.(44)

Wagner, Erika (IVIC, Venezuela) RE-EVALUATION OF THE WESTERN VENEZUELAN DABAJUROID TRADITION. This paper presents the results of the recently excavated Bachaquero site, located along the eastern Lake Maracaibo shore, in Distrito Bolivar, state of Zulia. Bachaquero is a large habitation and burial site, which yielded Dabajuroid pottery characterized by fabric impression, modeling and painting. Urn burials are common and subsistence was based on maize cultivation, hunting and gathering. In addition, based on research carried out in Venezuelan archaeology in the last decade, the spatio-temporal extension of Cruxent and Rouse's Dabajuroid series ("horizon style") is re-evaluated.(39)

Wallace, Ronald L. (Florida) AN ARCHAEOLOGICAL, ETHNOHISTORIC, AND BIO-CHEMICAL INVESTIGATION OF THE CENTRAL GEORGIA COAST, A.D. 1500-1650. Archaeological, ethnohistoric, and biochemical lines of evidence are brought to bear upon the problem of reconstructing the social organization and technological adaptation of the Guale aborigines of the Georgia coastal strand. The archaeological data were obtained during field sessions in the Summer of 1973 and 1974. Results of these excavations are compared with relevant Jesuit and Franciscan ethnohistorical materials to provide understanding of coastal social organization and subsistence. The biochemical investigations involved the



comparison of human skeletal remains with associated zooarchaeological materials to determine absolute and relative amounts of stable strontium—38 present in human bone. Ultimately, this provided information regarding aboriginal animal and plant utilization, which was then related to the subsistence data elicited from the ethnohistorical and zooarchaeological analyses, and soil samples subjected to standard chemical flotation techniques. The investigations revealed an aboriginal subsistence base of fishing, oystering, hunting of small mammals, and gathering of plant foods. Due to Spanish acculturation, this changed to an increasing reliance upon horticultural activities. These results need to be supplemented by further extensive excavation along the mainland areas of the Georgia coastal strand.(44)

Ware, John A., and Robert C. Euler (Colorado) AN EARLY BASKETMAKER II COMPLEX ON BLACK MESA, NORTHEASTERN ARIZONA. Excavations by the Black Mesa Archaeological Project in 1973 and 1974 have revealed new and early dates for Basketmaker II in northeastern Arizona. An open village site with a number of large pit structures excavated into poorly consolidated sandstone bedrock and associated with corn, basketry fragments, numerous milling stones and manos, and stemmed projectile points, has been provisionally dated by radiocarbon between 65 B.C. and 630 B.C. These cultural associations, which differ from the well-known and later Basketmaker II caves in the Tsegi drainage, permit the tentative description of a new phase, the Lolomai, for the Black Mesa Anasazi.(20)

Watson, Patty Jo (Washington) ASPECTS OF ZUNI PREHISTORY: THE CIBOLA ARCHAEOLOGICAL RESEARCH PROJECT. Survey and excavation were carried out in the Zuni-El Morro area during the summers of 1972 and 1973 (fieldwork and many of the subsequent analyses were supported by NSF grant GS 32987). As indicated by dendrodates and pottery seriation, major prehistoric activity in El Morro Valley occurred between A.D. 1250 and A.D. 1320, during which period several large masonry pueblos (200-500 rooms or more) were built, occupied, and abandoned. Preliminary results of chronological, faunal, floral, and artifactual analyses are presented with emphasis on the shifting demographic patterns that characterized the valley in the late thirteenth century.(20)

Watson, Patty Jo (Washington), Charles L. Redman (SUNY Binghamton), and Stephen A. LeBlanc (UCLA) THE CIBOLA ARCHAEOLOGICAL RESEARCH PROJECT: AN INTEGRATED SURVEY AND EXCAVATION STRATEGY FOR INTRA-REGIONAL INTERACTION INFORMATION. The El Morro Valley of west-central New Mexico is the regional focus for a program of intensive surface survey and small-scale excavations oriented toward elucidating problems concerned with changing organizational patterns. Areas contiguous to large sites and a probability sample of quadrats in each topographic zone has been surveyed in accordance with procedures set up by SARG. Rooms and trenches at each of the major sites have been excavated according to a highly stratified sampling procedure as well as rooms in a series of agglomerated small sites. A hierarchical attribute classification system has been devised for the painted pottery. With the aid of tree-ring dates, subsistence data, and architectural information it is possible to define the relative degree of interaction among and between room blocks for the sites examined.(37)

Watts, Gordon P., Jr. (North Carolina Dept of Cultural Resources) OCEANOGRAPHIC TOOLS AND TECHNIQUES IN UNDERWATER ARCHAEOLOGY: THE SEARCH FOR THE MONITOR. On August 27, 1973, a scientific party composed of archaeologists, oceanographers, and electronic engineers located the remains of the ironclad warship U.S.S. Monitor off the coast of North Carolina. The Monitor, perhaps the most revolutionary vessel of the nineteenth century, sank 15 miles south-southeast of Cape Hatteras on December 31, 1862. The location and subsequent identification of the vessel was the result of an interdisciplinary research proposal designed to both study a ridge and swale feature on the continental shelf, and evaluate the application of oceanographic tools and techniques to deep water shipwreck site location and identification. The investigation utilized a combination of precision positioning systems, proton precession magnetometer, and directional, vertical, and side-scan sonar to locate sites, and relied upon deep water photography and closed circuit television to identify them. In April 1974, a second cruise to the Monitor site was made for the purpose of obtaining a complete photographic and television tape record of the site, and collecting specific samples from the wreck for laboratory analysis. The project utilized the ultrasophisticated research vessel Alcoa Seaprobe. The oceanographic techniques adapted to the Monitor project have a broader application that can be generalized to assist in the development of future deep water site surveys. The work further implies that a great deal of that data essential to the surveying, analysis, and evaluation of deep water sites, presently beyond the technological limits of archaeological investigation can be effectively collected remotely.(38)

Weakly, Ward F. (Bureau of Reclamation) RELATIONSHIPS OF THE STATE ARCHAEOLOGIST WITH STATE AND FEDERAL AGENCIES. Two of the major areas in which problems arise for the state archaeologist and for federal agencies can be generally subsumed under the rubrics of coordination and procedures. An understanding of what is needed by both groups and how those requirements can be satisfied is a primary goal of this paper. A set of procedures, expectations, and methods for program development and documentation are presented. The necessity for certain new approaches and responsibilities is explored.(1)

Weed, Carol S. (see Hanson, John A.)(44)

Weide, David L. (Nevada), and Margaret L. Weide (SUNY Binghamton) TIME, SPACE, AND INTENSITY IN GREAT BASIN PALEOECOLOGICAL MODELS. Holocene climatic change in the Great Basin involves five time/space/intensity parameters of significance to paleoecological models. First, from an archaeological standpoint, data on climate change and a concomitant increase or decrease in carrying capacity have come from a few small, highly specialized microenvironments that may only partially represent the entire region. Second, no attempt has been made to establish the limits that define an area as inhabitable, especially to a population already culturally adapted to intermittently dependable food and water resources. Third, postglacial climate change in the Great Basin probably took place in a geographically irregular manner resulting in a series of stratigraphic, pollen, and geomorphic units that are similar and perhaps correlative, but not necessarily synchronous. Fourth, hydrologic models of pluvial lakes indicate that departures from present values of temperature and precipitation were relatively small during periods of change and were influenced by local conditions of microclimate, topography, and geologically controlled hydrology. Finally, while periods of departure from the climate of today were of considerable duration, the rate of transition between the extremes was relatively rapid. This may have produced conditions of ecological stress that are not reflected in the archaeological, sedimentary, or pollen record.(5)

Weide, Margaret L. (SUNY Binghamton) RESEARCH DESIGN IN NORTHEASTERN PREHISTORY. Computer banking of site locations relative to topographic and environmental variables does not in itself constitute a research design. Despite the success of large-scale settlement pattern studies undertaken in the American west and elsewhere, the charms of such an approach may not transplant to the eastern Woodlands, and the profession may be fooling itself if it justifies the next several years of contract archaeology as data gathering for settlement pattern archaeology. Explicit research questions focusing on population dynamics, technological development and subsistence changes will be discussed as sources of testable hypotheses appropriate to effective research design.(14)

Weide, Margaret L. (see Weide, David L.)(5)

Wendorf, Fred (Southern Methodist) AN ATERIAN KILL SITE IN THE EGYPTIAN SAHARA. In the spring of 1974, excavations were conducted at an Aterian kill site located 350 km west of Abu Simbel in the center of the Egyptian Sahara. The rich faunal remains included white rhino (Ceratotherium simum), extinct, camel (Camelus thomasi), gazelle (Gazella rufifrons and G. lamd), ass (Equus asinus), and a large bovid (probably the extinct Homoceras antiquus), associated with several thousand tools and artifacts. The site had been repeatedly utilized by Aterian hunters over a considerable period of time. Artifacts and fauna occurred throughout some 2 m of lacustrine sediments. A radiocarbon date of 43,300 B.P.±3000 years (SMU-177) was obtained on shell from the middle of the deposit; however, the true age is believed to be beyond the limits of the technique.(36)

Wetterstrom, Wilma E. (MIT) A NUTRITIONAL ANALYSIS OF THE TEHUACAN FOOD REAMINS. Richard MacNeish's Tehuacan Valley Project recovered a remarkable collection of food remains which provide a long, continuous record of the dietary changes accompanying the development of agriculture. This report presents a re-analysis of the floral and faunal data from a nutritional perspective. It assesses the limitations and potential of such data for inferring dietary composition and nutritional status and presents a methodology for analyzing the Tehuacan material. Results are described which suggest different conclusions about the Tehuacan diet and subsistence than have previously been proposed.(43)

Weymouth, John (Nebraska) THREE SEASONS OF MAGNETIC SURVEYING ON CENTRAL PLAINS SITES. Since the summer of 1972 we have been testing the value of magnetic surveys of typical Central Plains sites. Since these sites do not have such magnetically detectable structures as brick walls, kiln, or statuary, it is not obvious a priori whether magnetic surveying will be of value. We have found that it is possible to locate fire hearths and, under favorable conditions, cache pits. A brief discussion of the theory will be given along with a summary description of our data processing procedure. We will discuss our results, in particular those of 1974 on sites in northwestern Iowa and on the Missouri River in South Dakota.(14)

Whalen, Norman M. (Southwest Texas) ARCHAEOLOGICAL SURVEY IN SOUTHEASTERN IMPERIAL COUNTY, CALIFORNIA. A preliminary report is given of an archaeological survey in southeastern California where 188 sites were discovered on terraces between the Cargo Muchacho and Chocolate mountains and the floodplains of the Colorado River. The sites consisted variously of cleared areas having different geometric shapes including "sleeping circles," 12 unique "ceremonial" configurations, lithic remains, some heavily patinated with desert varnish, ancient trails, and a small quantity of ceramics. The character and distribution of the sites with an interpretation supported by factor analysis correlating architectural and artifactual components and terrace elevations is presented.(6)

Whatley, Bonnie L. (Northwestern) THE STUDY OF ANIMAL BONES WITHIN THEIR CULTURAL CONTEXT. Faunal remains when studied in conjunction with other archaeological data can better lead to the reconstruction of behavior patterns at various



levels of abstraction. Interpretation of faunal remains is facilitated through careful recording of debris, artifactual and structural associations for the bones at an archaeological site and in turn, later characterization of the condition of the faunal remains aids in the interpretation of the nature of these debris association. For instance, on a very basic level, characterizations of diet can only be attempted when faunal remains are studied in conjunction with botanical remains and when this information is combined with data derived from the study of human skeletal populations, nutritional reconstructions become more realistic. Finally, faunal exploitation should be interpreted as a part of a larger subsistence strategy. This can be accomplished by including relevant data from botanical and settlement pattern analyses in the study.(11)

Wheat, Joe Ben (University of Colorado Museum) ARTIFACT LIFE HISTORY RESEARCH—OR TYPOLOGY REVISITED. Current research at the University of Colorado Museum on projectile points from the Jurgens, Olsen-Chubbuck, Claypool, and other Plano period sites indicates that life history studies of individual artifacts have a strong bearing on typology, on utilization patterns, and on reconstruction of weaponry. The study demonstrates that many Plano projectile points have been utilized as knives as indicated by wear patterns, that hafting techniques are commensurate with this function, and that many complete projectile points are secondarily reworked from original points, thus calling for a reassessment of current typology.(33, 34)

Williams, Stephen (see Griffin, James B.)(7)

Williams-Dean, Glenna (Texas A&M) TECHNOLOGICAL STUDY OF ARCHAIC SANDALS FROM THE LOWER PECOS REGION OF TEXAS. A study was undertaken to describe, analyze, and classify the technological methods involved in the manufacture of fiber sandals recovered from the lower Pecos region of Texas. An examination of these unique representatives of Archaic clothing yielded an idea of the aesthetic and functional norms of the prehistoric inhabitants of the lower Pecos region as regarded footwear, and their variations over time and/or space. Subsequent comparison with published descriptions of sandals from Mexico and the American Southwest helped establish the range of these norms or styles and gave further insight into the cultural behavior of these Archaic Texans. The sandal collection which was partially analyzed is composed of specimens mainly from excavations or collections in Val Verde County, Texas.(22)

Windmiller, Ric (see Eddy, Frank W.)(40)

Wiseman, Frederick Matthew (Arizona) and Edward S. Deevey (Florida State Museum) THE EARLIEST MAYA. Recent palynological work suggests the entry of man into the Peten rainforest before or during the fourth millennium B.C. Modern pollen-ecological analogues applied to the analysis of fossil pollen recovered from Lake Eckixil, Peten, have isolated man-associated lowland pollen types and their fluctuations through time. Lowland colonization (4000-3500 B.C.) was followed by increased clearing and burning, but the absence of Zea pollen suggests this is "maizeless" cultivation. Zea is first evident in the pollen record around 2000 B.C., followed by a sharp increase in cultigen, weed and burning indicators after 1500 B.C. The intensity of lowland agriculture thereafter remained relatively constant until a rapid decline in agriculture indicators heralded the A.D. 800 Collapse.(27)

Witter, Dan (Arizona State Museum) THEORETICAL DIRECTIONS FOR ARCHAEOZOOLOGY. The paper is directed toward the theoretical use of faunal remains, arguing for a distinction between faunal analysis and archaeozoology. Reconstruction analyses such as the reconstruction of environment or reconstruction of diet or human activities would be relatively non-theoretical but, of course, vital pattern-recognition tasks for the faunal analyst. Archaeozoology, on the other hand, should be a body of dynamic processual theory. Unfortunately, we do not really have such a body of theory and are faced with having to develop it ourselves, now. Because of this problem, some possible productive directions are discussed, drawing from work with the Nunamuit caribou material to illustrate points. This paper focuses on operationalization of measures of organization of subsistence strategies and logistical structures and the sorts of data which would be required.(11)

Woodall, J. Ned (Wake Forest) A POSSIBLE CEREMONIAL PRECINCT IN VALENCIA COUNTY, NEW MEXICO. Near-complete excavation of a 50-room site in west-central New Mexico suggests its use as a restricted activity site, possibly centering around ceremonial activities. The site is located on top of a tiny butte, difficult of access and surrounded by sites on the valley floor. Partial excavation of the valley sites revealed no kivas or C-type rooms, whereas these are frequent on top of the butte; pictographs are present on top of the butte but not on its base; and certain artifact types are restricted to the butte top.(20)

Worf, William A. (United States Forest Service) CULTURAL VALUES IN THE WILDERNESS: THE WILDERNESS PERSPECTIVE. We examine this question from the standpoint of the basic reason for a Wilderness System which is: "to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States . . . ." To achieve this purpose Congress set a policy to: "secure for the American people . . . an enduring resource of

wilderness . . . . " The Act defines Wilderness and says it may also have "ecological, geological, or other features of scientific, educational, scenic, or historical value . . . . " It is clear, therefore, that the framers of the Wilderness Act accepted the fact that cultural values are a consistent part of Wilderness. (The wilderness resource itself is a part of our cultural heritage.) Cultural values must be carefully evaluated as part of the study process leading to a decision as to the suitability or non-suitability of any land for inclusion in the National Wilderness Preservation System. If the interpretation, protection, or use of these resources will require actions contrary to the protection of wilderness values, they should not be placed in the Wilderness System. Once included in the system, wilderness resource protection takes precedence over other values.(26)

Wright, Henry (Michigan) INFORMATION, CONTROL, AND POLITICAL HIERARCHY. Information-related concepts are useful for constructing testable propositions about political evolution. However, to test propositions involving concepts such as information processing, the hierarchy of codes, or the hierarchy of control will require that archaeologists collect data in new ways. Examples from centers of early state development will be discussed.(23)

Wylie, Henry G., QUANTIFICATION OF PROJECTILE POINT TYPOLOGIES: THE MEAN-MODEL METHOD. In the past, loose, subjective and over-generalized projectile point type descriptions have prevented all but the most superficial artifact comparisons. Proposed is an objective-statistical method which can conveniently and accurately characterize point types for purposes of detailed description and comparison. It may provide answers to the typical typological queries of "Are these the same as those or are they different?" and if so "How much?" and "In what ways?" The techniques, capabilities, limitations, and potential of this method are discussed, and a test example utilizing Elko split-stem and Joe's Valley projectile points from Utah is illustrated.(14)

Wymer, John J. (see Gladfelter, Bruce G.)(8)

Yesner, David R. (Connecticut-Storrs) MARITIME HUNTER-GATHERERS: DEMOGRAPHIC AND PALEODEMOGRAPHIC MODELS. Maritime hunter-gatherers are a specific subset of hunter-gatherers in general, characterized by a resource configuration allowing a wide variety of settlement patterns. These settlement patterns include varying degrees of sedentism, depending upon changes in the density or diversity of resources available at different times of the year or over longer periods of time. Construction of population models for maritime hunter-gatherers involves combination of demographic data from ethnographic and ethnohistorical sources with data from faunal and human skeletal materials. The Aleutian Islands are examined as a model area for this kind of study, and differences are noted from other arctic coastal populations. This methodology can also be extended to the analysis of non-coastal hunter-gatherer populations.(2)

Young, John N. (National Park Service) CULTURAL RESOURCE PRESERVATION: FEDERAL RESPONSIBILITIES IN WILDERNESS AREAS. Cultural resources are archaeological, architectural, and historical objects, structures, sites, and districts. Beginning with the passage of the Antiquities Act of 1906 and continuing to the present, a series of legislative and executive cultural resource preservation documents has appeared. Each subsequent item served to expand and make more inclusive the scope of federal interest, concern, and responsibility. This developmental sequence culminated in 1972 with the issuance of Executive Order 11593, which served to bind all of the preceding documents into a single comprehensive whole. Executive Order 11593 mandates many things, four of which are: every Executive Branch agency, bureau and office must: (1) compile an inventory upon which is listed every cultural resource for which it is trustee; (2) nominate all eligible properties under its effective control to the National Register of Historic Places; (3) preserve and protect the cultural resources for which it is responsible; and (4) insure that its plans, policies, procedures, and activities contribute to the preservation and protection of non-federally-owned cultural resources. Implications of the above four points for cultural properties in Wilderness are explored.(26)

Zeder, Melinda (Michigan) THE USE OF OSTEOLOGIC MICRO-STRUCTURE AND CHEMICAL COMPOSITION IN THE DETERMINATION OF WILD AND DOMESTIC CAPRINES. A major problem in zooarchaeological research in the Near East has been the determination of caprine remains from archaeological sites as wild or domestic. There are to date relatively few morphological characteristics which may be used in this aim (see Hole, Flannery, and Neely 1969). The answer to this problem may not lie in the gross morphology of the bone but rather in its micro-structure and chemical composition. Using techniques of polarized microscopy and x-ray diffraction Drew, Perkins, and Daley (1971) demonstrated differences in the alignment of the apatite crystals of bones of domestic and wild sheep and goats. Although a provocative first step in the use of such techniques in zooarchaeological study, the study had several drawbacks. First, the original study used only archaeological material which could not be positively identified as domestic or wild, and which were therefore unsuitable to test the effectiveness of these techniques. Secondly, they offered little in the way of concrete explanations for the difference noted. Keeping these drawbacks in mind, the approach of Drew, Perkins, and Daley is considered here. The micro-structure and chemical composition of the bones of modern wild and domestic Iranian sheep are examined, the domestic sheep representing three different herding strategies: lowland



sedentary, lowland-highland transhumant, and highland-highland transhumant. Such techniques as polarized microscopy, scanning electron microscope, and atomic absorption studies are used. The aim of the study is to determine differences in the inner structure and composition of bone which may be used archaeologically not only to distinguish between wild and domestic caprines but between caprines raised in different environments with different adaptive strategies.(24, 25)

Zeder, Melinda A. (see McArdle, John)(24, 25)

Zeimens, George (Office of the Wyoming State Archaeologist) WYOMING'S PROBLEMS IN THE ENERGY CRISIS. Since the advent of the "energy crisis" there has been a mad scramble by industry to begin to develop rich deposits of coal and uranium in Wyoming. Most of these deposits are most efficiently extracted by the open-pit mining method resulting in the surface disturbance of hundreds of thousands of acres. This, along with increased oil exploration and energy-related projects such as access roads, reservoirs, railroads, pipelines, and powerlines, have created some extremely difficult problems for the State Archaeologist. In the face of this increased work load the Wyoming Archaeologist continues to operate with a very small budget and no permanent staff. Other problems of major concern are the lack of communication and cooperation between federal and state agencies and industry. Most critical is the frightening fact that contract and salvage archaeology is a growing threat to the good, solid archaeological research that has gone on in Wyoming for the past few years.(1)

Zeitlin, Judith Francis (see Zeitlin, Robert N.)(2)

Zeitlin, Robert N., and Judith Francis Zeitlin (Yale) ENVIRONMENT AND CULTURAL ADAPTATION ON THE SOUTHERN ISTHMUS OF TEHUANTEPEC: THE PRECLASSIC, CLASSIC, AND POSTCLASSIC PERIODS. These papers describe the physical and biological resources of the Pacific coast of the Isthmus of Tehuantepec as they exist today, how they are used by indigenous peoples of the area, and how they are likely to have been altered from their prehistoric condition since the time of the Spanish Conquest. From this background, using data collected during our excavations and surface survey of the Rio de los Perros region, we attempt to describe the prehistoric use of these resources from about 1500 B.C. to A.D. 1500. Of particular interest is the diversity of the food procurement system in this area, in contrast to that of some other coastal environments where marine and estuary food resources are relied upon to a much greater degree. We will also examine the location of population centers in the past with respect to resource utilization and the effect of changing population densities on diet and food-getting activities.(2)

Zurel, Richard L. (Georgia) SEASONALITY OF UNMANAGED FOOD RESOURCES IN THE GREAT LAKES REGION: A LOOK AT THE CULTURAL AND ECOLOGICAL NICHE OF MARGINAL AGRICULTURE. Food resources historically recorded for the Indians of the Great Lakes region are combined with ecological and botanical information from southern Michigan to generate a model of seasonal availability of wild food resources and their relationship with emergent agriculture. It is suggested that emergent agriculture could have begun out of an archaic adaptation of a seasonal round and that a shift in settlement pattern or exploitation to alluvial bottomlands may not have been an essential ecological adaptation.(27)