

*Program*

# Program and Abstracts

**SOCIETY FOR  
AMERICAN ARCHAEOLOGY**

**THIRTY-SEVENTH ANNUAL MEETING**

Bal Harbour, Florida

4, 5, 6 May 1972

Thirty-Seventh Annual Meeting  
SOCIETY FOR AMERICAN ARCHAEOLOGY

The James A. Ford  
Library of Anthropology



Florida Museum of Natural History,  
Anthropology Division



Gift of: Dr. Kathleen A. Deagan

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Charles R. McGimsey III and Arthur J. Jelinek (to 1973)

## GENERAL INFORMATION

There are three types of sessions in the program. These are: **Symposia**: Organized presentations, information exchanged ahead of time, discussants programmed. Time as indicated. **General Sessions**: Papers volunteered by members, believed to be of some general interest. Grouped on apparent relationship into sessions. Twenty minutes maximum allowed per paper, which includes any discussion from the floor. Chairmen will be announced in final program, distributed at meeting. **"Research Papers"**: Title intended to cover many kinds of short, 10-minute papers. Space for informal discussion provided in adjacent room. It is hoped and expected that those on program will move there, singly or in groups, with those who wish to discuss the relevant topics.

It appeared necessary to cut down on the number of simultaneous sessions, which could have gone to 12 or 14 for this meeting. This strains facilities and promotes poor attendance.

**Location:** The Americana Hotel, 9701 Collins Avenue, Bal Harbour, Florida. Bal Harbour is immediately north of Miami Beach on Miami Beach Island. Collins Avenue is Florida highway A1A. The hotel is a compact unit containing nightclub, restaurant, stores, large open terraces with two swimming pools, and beach frontage. In addition to the beach frontage offered by the hotel, one of the largest sections of public beach in the Miami area is only one mile north of the hotel. This is Haulover Beach Park, and it features a golf course, tennis courts, marina, a grassy palm-lined beach ridge, and a wide beach strand.

**Accommodations:** Room reservations may be obtained at the Americana Hotel by returning the hotel registration card. There are many alternate facilities for housing in the area, but the Americana is the most convenient location. Make double-occupancy arrangements with the hotel.

**Travel:** If driving, after leaving the southern end of the Florida State Turnpike (this is the best way to come into Miami) take Florida highway 826 east to the beach. Turn right on Florida A1A, and the Americana is three miles south. There will be a parking fee of \$2.50 per day. If flying, you will find ample limousine and taxi service from Miami International Airport and the Ft. Lauderdale-Hollywood Airport.

**Registration:** Registration will be held in the lobby of the Americana Hotel between 6:00 p.m. and 9:00 p.m. on Wednesday evening, 8:00 a.m. and 5:00 p.m. on Thursday, and 8:00 a.m. and 11:00 a.m. on Friday. Registration fee is \$6.00 for students, \$7.50 for all other registrants. The registration fee includes a copy of the abstracts of papers delivered at the meeting.

**Abstracts:** A copy of the Program and Abstracts is included in the registration fee. Additional copies may be obtained at \$1.50 apiece by writing to SAA, 1703 New Hampshire Ave., N.W., Washington, D.C. 20009, and enclosing payment.

**Beverage Policy:** At the Americana the only legal alcoholic beverage service is that provided by the hotel. Corkage fees are charged for large orders of ice and glasses through room service. The Society will have functions on both Thursday and Friday nights which will have cash bars and serve drinks at prices \$.50 cheaper than house rates.

**Poolside Party:** On Thursday evening between 8:00 p.m. and 11:00 p.m. there will be a poolside party for Society members. A cash bar will be set up by the hotel.

**Open House:** An archaeology open house will be held in the Bal Harbour Room between 5:00 p.m. and 8:30 p.m. on Friday evening. The room will be supplied with tables, hors d'oeuvres (compliments of Florida Atlantic University) and cash bars.

**Baby Sitting:** A baby sitting service will be available through the hotel at \$1.50 per hour before midnight and \$2.00 per hour after midnight. There is a two-child maximum and a \$6.50 minimum.

**Meals:** Meals are available in the restaurant facilities of the hotel. In addition, the Society has arranged for cold plate lunches (on a cash basis) to be set up for members in the vicinity of the meeting rooms. These meals will facilitate attending meetings before and after lunch, and the lunches will be less expensive than those served in the hotel restaurants.

**Membership:** Only members may present papers. Lack of paid dues by May 4 will result in cancellation of place on program. Representatives of allied disciplines are excepted.

**Projectors:** One 35 mm projector and one overhead projector will be provided for each session.

## PROGRAM

### THURSDAY, MAY 4

- (1) SYMPOSIUM: MULTI-DISCIPLINARY RESEARCH AT THE GRASSHOPPER RUIN, ARIZONA  
Bal Masque Room
- A.M. Chairman and Organizer: W. A. Longacre (University of Arizona)  
9:00- R. H. Thompson (University of Arizona) Research and Field Training at Grass-  
12:00 hopper in Perspective  
P.M. W. A. Longacre (University of Arizona) The Archaeological Research Design at  
1:00- Grasshopper: Results to Date  
5:00 J. Jefferson Reid, David Wilcox, and M. B. Collins (University of Arizona) Pat-  
terns of Community Growth at Grasshopper  
J. S. Dean and William Robinson (University of Arizona) Dendrochronological  
and Dendroecological Research at Grasshopper  
Vorsila Bohrer (University of Massachusetts, Boston) Fossil Pollen and Macro  
Plant Remains at Grasshopper: Cultural and Environmental Implications  
Gerald Kelso (University of Arizona) Anthropological Implications of the Fossil  
Pollen at the Grasshopper Ruin  
Willard Van Asdall (University of Arizona) Ecological Studies at Grasshopper  
Thomas W. Mathews and Jerry Green (Southwest Archaeological Center, National  
Park Service) Analysis of the Mammalian Faunal Remains from Grasshopper  
Charminion McKusick (Southwest Archaeological Center, National Park Service)  
Analysis of the Avian Fauna from Grasshopper  
S. J. Olsen (Florida State University) Reptiles, Fishes, and Amphibians from  
Grasshopper  
Larry D. Agenbroad (Chadron State University) Geological Analyses at Grass-  
hopper  
Walter Birkby (Arizona State Museum) Analyses of Human Skeletons from Grass-  
hopper
- (2) SYMPOSIUM: AERIAL REMOTE SENSING TECHNIQUES IN ARCHAEOLOGY  
Medallion Room
- A.M. Chairman and Organizer: Thomas R. Lyons (University of New Mexico)  
9:00- William Meyer (U.S. Geological Survey) Some Concepts in Remote Sensing  
12:00 Al Marmelstein (Earth Satellite Corporation) Aerial Photographic Surveys for  
Underwater Archaeology  
Thomas R. Lyons and Robert K. Hitchcock, (University of New Mexico) Air  
Photo Interpretation of an Anasazi Land Route System  
Melvin L. Fowler (University of Wisconsin, Milwaukee) Aerial Archaeology at the  
Cahokia Site  
Elmer Harp, Jr. (Dartmouth College) Archaeological Remote Sensing in an Arctic  
Environment  
George J. Gumerman (Prescott College) The Unrealized Potential of Remote  
Sensing in Archaeology  
Discussants: William Meyer (U.S. Geological Survey), Jack N. Rinker (U.S. Army  
Engineer Topographic Laboratory), Richard S. Williams, Jr. (U.S. Geological  
Survey)
- (3) SYMPOSIUM: NEW DATA AND IMPLICATIONS FROM THE CENTRAL MAYA LOWLANDS  
Medallion Room
- P.M. Chairman and Organizer: R. E. W. Adams (University of Minnesota)  
1:00- Ingolf Vogeler (University of Minnesota) Cultural Geography and Ecological  
5:00 Background  
J. W. Ball (University of Wisconsin) The Regional Ceramic Sequence at Becan and  
Chicanna  
Jack Eaton (Tulane University) Chicanna: An Elite Center of the Rio Bec-Chenes  
Region  
David Potter (Tulane University) Formal Architecture at Becan  
David Webster (University of Minnesota) Fortifications at Becan and Maya Mil-  
itarism  
Irving Rovner (University of Wisconsin) Implications of the Lithic Analysis at  
Becan  
R. E. W. Adams (University of Minnesota) Summary and comment
- (4) GENERAL SESSION: METHOD AND THEORY (I)  
Pan American Room

- A.M. Chairman: Arthur Jelinek (University of Arizona)  
9:00 Robert G. Chenhall (Arkansas Archaeological Survey) Reliable Data Control for Multi-Site Research
- 9:20 David H. Thomas (City College, CUNY) Leonard Williams (University of California, Davis), and Robert Bettinger (University of California, Riverside) Notions to Numbers: Great Basin Settlement Patterns as Polythetic Sets
- 9:40 James Hill, Fred Plog, and Dwight Read (University of California, Los Angeles) Explaining Variability in Settlement Distributions
- 10:00 James W. Mueller (State College at Bridgewater) Experimental Archaeology: The Use of Sampling in Archaeological Survey, Part I
- 10:20 Joseph J. Lischka (University of Arizona) Can One Get More Out of a Pot Than Was Put Into It?
- 10:40 Charles S. Fletcher (State University of New York Agricultural and Technical College) The Ecology of Pottery: Then and Now
- 11:00 Michael B. Schiffer (University of Arizona) A Synthetic Model of Archaeological Inference
- 11:20 Cynthia Irwin-Williams (Eastern New Mexico University) The Seasonal Strategy
- 11:40 Donald E. McVicker (Loyola University of Chicago) The Cemetery Seminar
- 12:00 Edward B. Jelks (Illinois State University) Observations on the Concept(s) of Association in Archaeology

(5) GENERAL SESSION: METHOD AND THEORY (II)

- P.M. Pan American Room  
Chairman: Irving Rouse (Yale University)
- 1:00 Fred Plog (University of California, Los Angeles) The Archaeologist's Concept of Time
- 1:20 Charles L. Redman (New York University) Early Village Tool Technology
- 1:40 Parker Nunley (El Centro College) Gathering Societies: A New Model for Archaeologists
- 2:00 D. Bruce Dickson (School of American Research) Survey and Sampling (Topic)
- 2:20 George L. Cowgill (Brandeis University) Systems, Laws, Paradigms, and Good Ideas
- 2:40 Joseph L. Chartkoff (Michigan State University) Some Comments on Empiricist and Positivist Approaches in Archaeological Research
- 3:00 Keith M. Anderson (National Park Service) E. Pierre Moreon, Olin F. McCormick III, and Kathleen Gilmore (Southern Methodist University) Deductive Strategy and Salvage Archaeology: An Example from East Texas
- 3:20 Donald A. Graybill (University of Arizona) Factor and Cluster Analysis: Comparison, Application, and Archaeological Utility
- 3:40 Morgan J. Tamplin (University of Arizona) Cluster Analysis of Lithic Assemblages Using the BC TRY System

(6) GENERAL SESSION: ARCTIC

- A.M. Eastward Room  
Chairman: James Tuck (Memorial University, Newfoundland)
- 9:00 Robert E. Ackerman (Washington State University) Archaeology Today in Southeastern Alaska
- 9:30 William Fitzhugh (Smithsonian Institution) The Circumboreal Hypothesis Revisited: New Data and Interpretations from the North Atlantic Littoral
- 10:00 Charles E. Holmes (University of Alaska) Archaeological Materials from the Upper Koyukuk River Region, Alaska: The Problems of Affinities and Dating
- 10:30 John P. Cook (University of Alaska) The Dixthada Site, Central Alaska
- 11:00 Ronald J. Nash (Manitoba Museum of Man and Nature) Archaeological Investigations in the Transitional Forest Zone
- 11:30 C. H. Reeves (University of New Mexico) A Reexamination of the Validity of Northern Adaptive Strategies

(7) SYMPOSIUM: FUNCTIONAL ANALYSIS AND MICROWEAR STUDIES OF STONE AND BONE TOOLS

- P.M. Eastward Room  
Organizers: Alan McPherron (University of Pittsburgh) and Ruth Tringham (Harvard University)
- 1:00 George Frison (University of Wyoming) Evidence for Use on Tool Assemblages from Plains Bison bison and Bison antiquus Butchering Sites
- 5:00 Joel Gunn (University of Pittsburgh) Morphological Analysis System (MAS): A Softwear Package Oriented Toward the Metric Analysis of Artifact Shapes
- Alexander Marshack (Harvard University) Microscopic Study of Upper Paleolithic Engraved Materials
- Alan McPherron (University of Pittsburgh) Scanning Electron Microscope Study of Borers from Cahokia and from Yugoslavia
- Joel Shiner (Southern Methodist University) Microwear Studies with the Scanning Electron Microscope
- Don Crabtree (Idaho State University) Some Comments on Artifact Edge Angles
- Ruth Tringham (Harvard University) Evaluation of the Present Status of Microwear and Functional Studies

- Discussants: Lewis Binford (University of New Mexico), Edwin Wilmsen (University of Michigan), John Witthoft (University of Pennsylvania)

(8) RESEARCH PAPERS: SINGLE AREAS AND TOPICS

- Westward Room 4; discussion Westward Room 5  
A.M. Chairman: Charles H. Fairbanks (University of Florida)
- 9:00 J. M. Adovasio (Smithsonian Institution) Basketry as an Indicator of Archaeological Frontiers
- William S. Ayres (University of South Carolina) Easter Island Prehistory and New World-Pacific Contacts. Recent Research
- Annetta L. Cheek (University of Arizona) A Typology of Artifacts from Historic Sites
- G. A. Clark (Arizona State University) The Asturian of Cantabria
- Carl J. Clausen (Bureau of Historic Sites and Properties, Florida) Underwater Excavation at Little Salt Springs and Warm Mineral Springs, Florida
- 10:00 R. A. Flayhart and Elizabeth Ann Morris (Colorado State University) The T-W Diamond Site, a Stone Ring Locality in N. Central Colorado
- Richard G. Forbes (University of Calgary) The Majorville Cairn and Medicine Wheel, Alberta
- James G. Gunnerson (Northern Illinois University) A Possible Origin for Simple Stamping on Plains Pottery
- James J. Hester (University of Colorado) Environmental Resource Utilization in the Bella Bella Region, N.W. Coast
- Roger E. Kelly (San Fernando Valley State College) On Persistence in Southern California Prehistory
- 11:00 Vladimir Markotic (University of Calgary) The Late Neolithic in Southeast Europe
- Sarah Milledge Nelson (University of Michigan) Early Settled Villages in Korea: Evidence of Incipient Food Production
- Jason W. Smith (Boise State College) Large-Scale Archaeology in Idaho
- S. G. Stephens (North Carolina State University, Raleigh) Probable Centers of Domestication of Cotton in the Americas
- Lathel F. Duffield (University of Kentucky) Determining the Age and Sex of the Post-Cranial Skeleton of Bison
- 12:00 Frederick Lange (Beloit College) and Jerome S. Handler (Southern Illinois University) An Archaeological Investigation of the Domestic Life of Plantation Slaves in Barbados
- Kimio Suzuki (Keio University, Japan) Japanese Archaeology: A Historical Sketch

(9) RESEARCH PAPERS: EASTERN U.S.

- Westward Room 4; discussion Westward Room 5  
P.M. Chairman: E. Thomas Hemmings (Florida State Museum)
- 1:00 Jane E. Buikstra (Northwestern University) The Lower Illinois River Valley: A Regional Program in the Excavation and Study of Human Skeletal Material
- Ripley P. Bullen, Adelaide K. Bullen, and E. Thomas Hemmings, Jr. (Florida State Museum) The River Styx Mound, a Depository for Deptford Cremations
- Charles E. Cleland (Michigan State University) Current Research in the Traverse Corridor of Northwestern Michigan
- John W. Fuller (University of Washington) Development of Late Prehistoric Towns in the W. Virginia Uplands
- William M. Hurley (University of Toronto) Effigy Mound Material Culture
- 2:00 A. R. Kelly (University of Georgia) From Earth Lodges to Wattle and Daub Structures in Georgia
- William H. Marquardt (Washington University) Recent Investigations in Western Kentucky Shell Mounds
- Ellis E. McDowell (American University) A Techno-Ecological Model for Analysis of Archaeological Materials in the Potomac Piedmont
- Melburn D. Thurman (University of Maryland) New Excavations at the Accokeek Creek Site
- Daniel E. Penton (Division of Archives and History, Florida) Salvage Excavations at Hutto Pond, Madison County, Florida
- 3:00 Curtis E. Peterson (Division of Archives and History, Florida) A Wooden Aboriginal Figurine and Post Mortar from Florida
- Burton L. Purrington (Appalachian State University) A Reappraisal of the C&O Mounds and Adena Occupation of the Eastern Kentucky Mountains
- Nan Rothschild (New York University) Sexual Role and Status in Prehistoric Societies of Eastern N. America
- Frank Schambach (Southern State College) Deer Ceremonialism in Early Caddo Culture
- James B. Stoltman (University of Wisconsin) McKinstry Mound 1 Revisited: A Stratified Site Yields New Evidence of Cultural Variation Within the Laurel Phase of Minnesota
- 4:00 Patty Jo Watson (Washington University) Archaeology of the Mammoth Cave Area

4:15 Janet Rafferty (University of Washington) The Nature of the Adena-Ft. Ancient Transition in Northern Kentucky

BUSINESS MEETING  
5:00 Medallion Room

FRIDAY, MAY 5

(10) SYMPOSIUM: THE UNIVERSITY OF WISCONSIN-MILWAUKEE CAHOKIA ARCHAEOLOGY PROJECT

- Bal Masque Room  
A.M. Chairman and Organizer: Melvin L. Fowler (University of Wisconsin, Milwaukee)  
9:00-Part I. Introduction  
12:00 The Cahokia Mapping Project; Goals, Techniques, and Results  
P.M. Melvin L. Fowler (University of Wisconsin, Milwaukee)  
1:00- Cahokia Chronology and Phases  
5:00 Robert L. Hall (University of Illinois, Chicago Circle)  
Part II. The Area Resource Base and Settlement Patterns  
Biological Resource Base and Area Ecology  
Michael Gregg (University of Wisconsin, Milwaukee)  
Faunal Remains from the Cahokia Site Complex  
Paul W. Parmalee (Illinois State Museum)  
Settlement Patterns and Cahokia  
Keith Brandt (University of Wisconsin, Milwaukee)  
Part III. Excavations and Field Data  
The First Terrace of Monks Mound  
Elizabeth Benchley (University of Wisconsin, Milwaukee)  
The East Lobes of Monks Mound  
Kenneth Williams (University of Wisconsin, Milwaukee)  
Mound 72  
James Anderson (Cahokia Mounds Museum)  
Skeletal Analysis of Mound 72  
Jerome Rose (University of Massachusetts)  
The Merrell Tract  
Robert Salzer (Beloit College)  
The Central Enclosure  
James Anderson (Cahokia Mounds Museum)  
Part IV.  
Summary and Interpretations  
Melvin L. Fowler (University of Wisconsin, Milwaukee)

(11) SYMPOSIUM: THE LATE PREHISTORIC/HISTORIC ESKIMOS OF INTERIOR NORTH ALASKA

- Medallion Room  
A.M. Chairman and Organizer: Edwin S. Hall, Jr. (State University of New York, Brockport)  
9:00- Ernest S. Burch, Jr. (University of Manitoba) The "Nunamiut" Concept and the Standardization of Error  
12:00 Lewis R. Binford (University of New Mexico) Demography—Nunamiut Hunters and the Malthusian Argument  
Charles W. Amsden (University of Manitoba) But What Happened in Between: Nunamiut Settlement, Community, and Exploitative Patterns—1900 to 1970  
James Corbin (Washington State University) Early Historic Nunamiut House Types  
Edwin S. Hall, Jr. (State University of New York, Brockport) A Preliminary Analysis of House Types of Tuktoo Lake, Northern Alaska  
Clifford G. Hickey (University of Alberta) Variation in Basic Economic Structure of the Arctic Woodland Culture  
Annette McFadyen and Donald W. Clark, (National Museum of Canada) Koyukuk Athapaskan-Kobuk Eskimo Cultural Relationship  
Discussants: John M. Campbell (University of New Mexico), William N. Irving (University of Toronto)

(12) SYMPOSIUM: ANDES-AMAZONIA

- Medallion Room  
P.M. Organizer: Akkaraju V. N. Sarma (Temple University)  
1:00- Chairmen: Donald Lathrap (University of Illinois), Edward Lanning (Columbia University)  
5:00 Donald E. Thompson (University of Wisconsin) Sites in the Puna Bordering the Upper Maranon in Northern Peru  
Thomas C. Patterson (Temple University) Relationship Between the Central Coast of Peru and Other Areas in Prehistoric Times  
Akkaraju Sarma (Temple University) Environmental Modes Applicable to the Coastal Regions of Andes, Montana, and Tropical Forest  
Allison C. Paulsen, Prehistoric Trade Between S. Coastal Ecuador and Other Parts of the Andes

- Donald Lathrap (University of Illinois) Cultural Contact and Culture Areas in Early Northern S. America  
Chiaki Kano (University of Tokyo) The Problems of Chavin and Pre-Chavin  
Peter G. Roe (University of Illinois) The Cumancaya Culture and Its Relationships to the Sierra  
John R. Cole (Columbia University) Trans-Andean Contact: Preceramic and Other Lithic Evidence  
Raymond Scott (University of Calgary) Some Speculations on the Economic Importance of the Upper Montana of Peru to Prehistoric Highland Civilizations  
William Isbell (State University of New York, Binghamton) Quechua Speakers and the Cultivation of Steep Hillsides

(13) GENERAL SESSION: MESOAMERICA (I)

- Pan American Room  
A.M. Chairman: Robert Wauchope (Tulane University)  
9:00 Thomas H. Charlton (University of Iowa) The Significance of an Historical Event in the Archaeology of the Valley of Mexico  
9:20 Kenneth L. Brown (Pennsylvania State University) Ball Court Construction: Its Relationship to Classic Settlement Pattern and Teotihuacan Influence in the Valley of Guatemala  
9:40 William Doelle and Edward B. Sisson (Robert S. Peabody Foundation for Archaeology) Post-Classic Architecture of the Tehuacan Valley, Puebla, Mexico: A Preliminary Assessment  
10:00 Edward B. Sisson (Robert S. Peabody Foundation for Archaeology) A Preclassic Ceramic Sequence for the Western Chontalpa, Tabasco, Mexico  
10:20 Peter T. Furst and Stuart Scott (State University of New York, Buffalo) The Sun-Father's Ladder: An Ethnographic-Archaeological Parallel from Western Mexico  
10:40 J. Charles Kelley (Southern Illinois University) Voladores and Archaeological Village Models in Western Mesoamerica  
11:00 L. R. V. Joesink-Mandeville (California State College, Fullerton) Concerning Olmec-Mayan Relationships: A Correlation of Linguistic Evidence with Archaeological Ceramics  
11:20 Richard E. Blanton, Karl Kutruff, and Dudley Varner (Rice University) Settlement Pattern Survey at Monte Albán  
11:40 James A. Neely (University of Texas, Austin) Prehistoric Domestic Water Supplies and Irrigation Systems at Monte Albán

(14) GENERAL SESSION: MESOAMERICA (II)

- Pan American Room  
P.M. Chairman: Robert E. Greengo (University of Washington)  
1:00 Dennis E. Puleston (University of Minnesota) The Role of Semi-Domesticated Animal Resources in Middle American Subsistence  
1:20 Jonathan E. Reyman (Southern Illinois University) The Quetzalcoatl-Tetzcatlipoca Conflict at Tula: An Alternative Hypothesis  
1:40 S. Jeffrey K. Wilkerson (Dumbarton Oaks) An Archaeological Sequence from Santa Luisa, Veracruz, Mexico  
2:00 David W. Sedat (Claremont Graduate School) The Preclassic Lowland Maya and Their Northern Highland Neighbors  
2:20 William J. Rathje (University of Arizona) and Jeremy Sabloff (Harvard University) Cozumel, Quintana Roo, Mexico: One Test of a Model of Cultural Fluidity and Ports of Trade  
2:40 Nicholas M. Hellmuth (Yaxha Project) A Street System at Classic Maya Yaxha, Guatemala  
3:00 Norman Hammond (Cambridge University) Functional Zones and Differential Traffic Flow in a Maya Ceremonial Center  
3:20 Charles Cheek (University of Tulsa) Political Themes on Mesoamerican Stelae  
3:30 Ernestine Green (Western Michigan University) Location Analysis of Prehistoric Maya Sites in Northern British Honduras

(15) GENERAL SESSION: SOUTHEASTERN U.S.

- Eastward Room  
A.M. Chairman: Bennie C. Keel (University of North Carolina)  
9:00 Charles H. Faulkner (University of Tennessee) Middle Woodland Subsistence-Settlement Systems in the Middle South: A Hypothetical Model  
9:20 David J. Hally (University of Georgia) The Development of Mississippian Culture in the Upper Tensas Basin of Louisiana  
9:40 Jerald T. Melanitch (Smithsonian Institution) The Specific Evolution of the Coastal and Middle Eastern Traditions in Georgia  
10:00 Bennie C. Keel and Jefferson Chapman (University of North Carolina) The Cultural Position of the Conestee Phase in Southeastern Prehistory  
10:20 David S. Phelps (East Carolina University) Swift Creek in Northwest Florida  
10:40 George Stuart (George Washington University) The Archaeological Situation in the Middle Wateree Valley, South Carolina  
11:00 Alan Toth (Louisiana State University) The Marksville Period in the Lower Mississippi Valley

11:20 John A. Walthall (Mound State Monument) Copena: Subsistence and Settlement  
11:40 William H. Sears (Florida Atlantic University) Problems of Prehistoric Culture on  
the Eastern Gulf Coastal Plain

(16) SYMPOSIUM: TOWARD SALVAGING SALVAGE ARCHAEOLOGY

Eastward Room  
P.M. Chairman and Organizer: Thomas King (University of California, Riverside)  
1:00- Jonathan Haas (University of Arizona) Arizona Highway Salvage Program  
5:00 Tom King (University of California, Riverside) A "Cooperative" Model for Salvage  
Archaeology  
Stuart Struver (Northwestern University) Salvaging Salvage Archaeology  
Donald Miller (U.S. Forest Service) The Transition from "Salvage" to "Research"  
Archaeology in the National Forests in California  
C. R. McGimsey, III (Arkansas Archaeological Survey) Regional Overviews and  
Archaeological Priorities  
William Lipe (State University of New York, Binghamton) Salvage Archaeology  
C. William Clelow (University of California, Berkeley) The Salvage Program,  
Private Enterprise, and the Crisis in American Archaeology  
Discussants: Ernest A. Connally (National Park Service), Richard Daugherty  
(Washington State University)

(17) RESEARCH PAPERS: TECHNICAL REPORTS, TECHNIQUES, AND METHODS

Westward Room 4; discussion Westward Room 5  
A.M. 9:00 Chairman: Patty Jo Watson (Washington University)  
Patricia O'Brien (Kansas State University) Steed-Kisker Mississippian and Labor  
Specialization  
Patrick J. Munson (Indiana University) Distribution Patterns of Some Early Pro-  
jectile Point Types in the Midwest and Their Implications  
William S. Glennan (University of California, Los Angeles) Mannix Lake Lithic  
Industry: Early Lithic Tradition or Workshop Refuse  
Debi Honord (University of Arizona) Some Problems in the Dating of Metallurgi-  
cal Slag  
E. Gary Stickel and Jonathan E. Ericson (University of California, Los Angeles) A  
Proposed Classification System for Ceramics  
10:00 Mark N. Cohen (State University of New York, Plattsburgh) Possibilities and  
Limits in the Quantitative Analysis of Organic Residues  
R. E. Taylor (University of California, Riverside) Advances in Amino Acid Dating  
J. R. Cann and Norman Hammond (Cambridge University) Trace-Element Analy-  
sis of Maya Jade Sources—Preliminary Results  
Louis Tartaglia (University of California, Los Angeles) Reconstruction of Ceramic  
Technology by X-Ray Photographic Analysis  
11:00 Timothy Hagan (Charles Museum) and Jonathan E. Ericson (University of Cali-  
fornia, Los Angeles) Obsidian Sources in California Prehistory  
Martha I. Symes (Colorado State University) A Methodological Analysis of  
Obsidian Workshops in the Nochixtlan Valley, Oaxaca  
Jonathan E. Ericson and Rainer Berger (University of California, Los Angeles)  
Obsidian Hydration Dating: Further Studies on the Chemical and Physical Para-  
meters Affecting the Hydration Rate of Obsidian  
Leslie B. Davis (Montana State University) The Effects of Obsidian Compositional  
Types on Hydration Rate Variation  
Frank J. Findlow (University of California, Los Angeles) The Accuracy Problem  
and Hydration Determinations Under Two Microns  
12:00 Michael J. Moratto (San Francisco State College) Paleodemography in the Western  
Sierra Nevada, California  
Kathleen Gilmore (Southern Methodist University) The Isolation of Social Groups  
Among Prehistoric Caddo by Ceramic Attribute Analysis  
John McArdle (State University of New York, Plattsburgh) An Application of  
Computers to the Quantification and Analysis of Zooarchaeological Data  
  
P.M.  
1:00 Chairman: Edward Jelks (Illinois State University)  
Barbara A. Purdy (University of Florida) The Importance of Quarry Sites  
John W. Rick (University of California, Santa Cruz) Heat Altered Cherts of the  
Lower Illinois Valley  
M. D. Mandeville and J. J. Flenniken (Iowa State University) A Comparison of the  
Flaking Qualities of Nehawka Chert Before and After Thermal Pretreatment  
Joel I. Klein (New York University) Chert and Flint: Thermal Alteration and  
Identification  
Ronald H. Spielbauer (Miami University) Aboriginal Chert Utilization in Union  
County, Illinois  
2:00 Harry J. Shafer (University of Texas, Austin) Lithic Technology Investigations at  
the George C. Davis Site  
Dwight W. Read (University of California, Los Angeles) The Use of Random  
Samples in Regional Surveys  
Denise E. King (Michigan State University) Sampling in Regional Programs

Frank Fryman (Bureau of Historic Sites and Properties, Florida) Building an  
Archaeological Data Bank: Progress Report from Florida  
3:00 Sylvia W. Gaines (Arizona State University) Computer Application in an Archae-  
ological Field Situation  
Stephen Plog (University of Michigan) The Relative Efficiencies of Sampling  
Techniques for Archaeological Survey  
Fekri Hassan (Southern Methodist University) Population Dynamics and Terminal  
Pleistocene Adaptations

(18) RESEARCH PAPERS: SOUTHWESTERN U.S.

Westward Room 4; discussion Westward Room 5  
P.M. 3:30 Chairman: Richard B. Johnston (Trent University)  
Theodore R. Frisbie (Southern Illinois University) The Chacoan Interaction  
Sphere: A Verification of the Pochteca Concept Within the Southwestern U.S.  
W. James Judge (University of New Mexico) The Chaco Canyon Survey: 1971  
Robert H. Lister (University of New Mexico) Chaco Canyon Studies by the New  
Mexico Archaeological Center  
Don P. Morris (National Park Service) Terminal Subsistence Patterns in Canyon  
De Chelly, Arizona  
James T. Rock (University of Arizona) Behavioral Chain Activities at Grasshopper  
Evan I. DeBlois (U.S. Department of Agriculture, Forest Service) Pueblo Site  
Distributions on Elk Ridge, Southeastern Utah: The First Season of the Elk  
Ridge Archaeological Project

ANNUAL PARTY

5:00 Ballroom

SATURDAY, MAY 6

(19) SYMPOSIUM: RECENT ALEUTIAN RESEARCH

Bal Masque Room  
A.M. 9:00 Chairman and Organizer: Jean S. Aigner (University of Connecticut)  
Alan M. Bieber (University of Connecticut) Statistical Analysis of Stone Tool  
12:00 Distribution at the Anangula Blade Site  
P.M. 1:00 Jean S. Aigner (University of Connecticut) Studies in the Early Prehistory of  
Nikolski Bay: 1937-1971  
4:00 James C. Chatters (University of Connecticut) Early Russian Impact on the Aleut  
Population  
Michael Yarborough (University of Arkansas) Analysis of Pottery from the West-  
ern Alaska Peninsula  
A. P. McCartney (University of Arkansas) Prehistoric Cultural Integration Along  
the Alaskan Peninsula  
Douglas W. Veltre (University of Connecticut) An Analysis of Anangula Blade  
Tools  
Bruce Fullen (University of Connecticut) Analysis of the Anangula Cores and  
Tablets  
Albert B. Harper (University of Connecticut) Osteodensitometric Analysis of  
Skeletal Remains  
Christy G. Turner, II, and Jacqueline A. Turner (Arizona State University) Aleut  
Archaeology, Biology, and Demography  
Donald W. Clark (National Museum of Man, Canada) The Earliest Prehistoric  
Cultures of Kodiak Island, Alaska  
Charles E. Holmes and E. James Dixon Jr. (University of Alaska) Excavation at  
49 RAT-32, Amchitka Island, Alaska  
Robert A. Black (University of Connecticut) Geology and the Ancient Aleuts:  
Amchitka and Umnak Islands, Aleutians  
Discussant: Don E. Dumond (University of Oregon)

(20) SYMPOSIUM: PROBLEMS AND POSSIBILITIES  
OF ARCHAEOLOGICAL FIELD SCHOOLS

Medallion Room  
A.M. 9:00 Chairmen: William P. McHugh and G. Richard Peske (University of Wisconsin,  
Milwaukee)  
12:00 William P. McHugh (University of Wisconsin, Milwaukee) Student Training in  
European Prehistory—1971  
Stuart D. Scott and Charles Cazeau (State University of New York, Buffalo)  
Archaeological Field School in Sinaloa, Mexico  
Patrick M. Malone and John L. Cotter (University of Pennsylvania) Field Train-  
ing: Historic Sites Archaeology  
G. Richard Peske (University of Wisconsin, Milwaukee) Research and Training  
Students in the Field: Chaos or Harmony?  
William J. Judge (University of New Mexico) Archaeology Field School: Training  
Session or Legitimate Research  
William M. Gardner (Catholic University of America) Comparison of a "com-  
muter" and a "residential" Field School

David H. Thomas (City College, CUNY) Chi-Square in the Desert  
 Marian E. White (State University of New York, Buffalo) An Archaeological Field School in New York State  
 Peter P. Pratt (State University of New York, Oswego) Oswego Field School in Archaeology  
 Dale R. Henning and Elizabeth R. Henning (University of Nebraska) Archaeological Field Training at the University of Nebraska  
 Discussants (tentative): Raymond H. Thompson and William A. Longacre (University of Arizona)

(21) GENERAL SESSION: PREHISPANIC METALLURGY

Medallion Room  
 P.M. Chairman: Christopher B. Donnan (University of California, Los Angeles)  
 1:00 Joel Grossman (University of California, Berkeley) The Beginnings of Metallurgy in the S. Central Highlands of Peru  
 1:30 Heather Lechtman (Massachusetts Institute of Technology) Some Further Studies of Chimú Gilding  
 2:00 Karen Olsen Bruhns (San Jose State College) Prehispanic Lost Wax Casting Molds from Central Colombia  
 2:30 Clair C. Patterson (California Institute of Technology) The Development of Arsenio-Copper Alloys in Peru During Middle Horizon Times  
 3:00 Christopher B. Donnan (University of California, Los Angeles) "A Precolumbian Smelter from Northern Peru"

(22) GENERAL SESSION: TECHNICAL STUDIES

Pan American Room  
 A.M. Chairman: Ripley P. Bullen (Florida State Museum)  
 9:00 R. Abascal (Instituto Nacional de Antropología e Historia), Garman Harbottle, and E. V. Sayre (Brookhaven National Laboratory) Neutron Activation Study of Thin Orange  
 9:20 Kent A. Schneider, John E. Noakes, and James Spaulsind (University of Georgia) Tracing the Origins of Georgia Copper Artifacts by Neutron Activation Analysis: II  
 9:40 Charles E. Bolian (University of New Hampshire) The Usefulness of Temper as a Criterion in Ceramic Typology  
 10:00 John P. Bradbury (University of Minnesota) A Diatom Stratigraphy of the Tepexpan Man Site in the Basin of Mexico  
 10:20 James Schoenwetter (Arizona State University) Archaeological Pollen Studies in the Lower Illinois River Valley  
 10:40 Richard I. Ford and Joel N. Elias (University of Michigan) Teotihuacan Paleoethnobotany  
 11:00 Phil C. Weigand and Garman Harbottle (Brookhaven National Laboratory) Turquoise Sources and Source Analysis: Mesoamerica and the Southwestern U.S.A.  
 11:20 Elizabeth S. Wing (Florida State Museum) Preliminary Report on the Prehistoric Use of Animal Resources in the Peruvian Andes

(23) GENERAL SESSION: LITHIC STUDIES

Pan American Room  
 P.M. Chairman: Joel Shiner (Southern Methodist University)  
 1:00 Arthur J. Jelinek (University of Arizona) Fundamental Problems in the Description of Lithic Industries Exemplified by the Et Tabun Paleolithic Collections  
 1:20 Karen E. Strother (Yale University) A Method for the Technological Analysis of Unspecialized Lithic Industries  
 1:40 L. Lewis Johnson (Polytechnic Institute of Brooklyn) Flint Knapping, Computers, and Lithic Technology  
 2:00 Ruthann Knudson (Washington State University) Parallel-Collateral Flaking in the Plains: Plainview and MacHaffie  
 2:20 Carl Phagan (Ohio State University) The Concept of Relative Masses as a Perspective in Defining and Solving Problems in Lithic Technology: An Example of Its Application to Problems of "Fluting"  
 2:40 Richard A. Strachan (Mankato State College) and Timothy C. Klinger (Wayne State University) A Statistical Approach to the Classification of Projectile Points  
 3:00 Carol S. Weed (Arizona State Museum) Classic Period Hohokam Lithic Assemblages

(24) GENERAL SESSION: EARLY MAN AND PLEISTOCENE EXTINCTION

Eastward Room  
 A.M. Chairman: Dr. Charles Hoffman, Jr. (University of Florida)  
 9:00 Larry D. Agenbroad (Chadron State College) A Paleo-Indian Bison Kill in the Panhandle of Nebraska  
 9:20 Vance Haynes (Southern Methodist University) Geochronology and Paleoenvironments of the Murray Springs Clovis Site, Arizona  
 9:40 Gerald Kelso (University of Arizona), Larry D. Agenbroad (Chadron State College), and C. Vance Haynes (Southern Methodist University) Clovis Hunting Camps at Murray Springs, Arizona: An Analysis After 2 Field Seasons

10:00 E. James Dixon, Jr. (University of Alaska) The Gallagher Flint Station, an Early Man Site, North Slope, Arctic Alaska  
 10:20 Paul S. Martin (University of Arizona) The Discovery of America  
 10:40 William E. Edwards (Temple Buell College) The Synchronicity of Deglaciation and Megafaunal Extinction  
 11:00 Donald Lee Johnson (University of Illinois) On The Origin and Extinction of Pygmy Elephants, North Channel Islands, California  
 11:20 James L. Michie (University of South Carolina) Early Man in South Carolina  
 11:40 Floyd Painter (The Chesapeake) Paleo Man's Tool Kit: Special Tools from the Williamson Paleo Workshop Site, Virginia  
 12:00 Ben Waller (Florida) Early Man Evidence from Florida  
 12:20 Brian Reeves (University of Calgary) Late Paleo-Indian (8,000-5,500 B.C.) Land/Resource Utilization Patterns in Waterton Lakes National Park

(25) GENERAL SESSION: SOUTH AMERICA

Eastward Room  
 P.M. Chairman: William Mayer-Oakes (Texas Tech University)  
 12:30 Richard N. Belding (University of Texas, Austin) The Gallinazo Phenomenon—Valley or Intervalley Hegemony  
 12:45 David L. Brown (Washington University) Prehistoric Pastoral Nomadism of Jauja-Huancayo Basin  
 1:00 Sergio Chavez (Central Michigan University) Archaeological Reconnaissance in Chumbivilcas (Cuzco) Peru  
 1:15 Mark Druss (York College, CUNY) Environment, Subsistence Economy, Settlement Patterns of the Chinchin Complex, Northern Chile  
 1:30 James S. Kus (Fresno State College) The Chicama-Moche Canal in Chimú  
 2:00 Jorge G. Marcos (Ecuador) Current Excavations at an Early Valdivia Site in Chanduy Valley, Coastal Ecuador  
 2:15 Eugene McDougle (Columbia University) Climate Change and Population Shifts Along the Southwestern Ecuadorian Coasts  
 2:30 Craig Morris (Brandeis University) "New" Evidence on Inca Urbanism from Huanuco Pampa  
 3:00 Presley Norton (Foundation for Ecuadorian Anthropological Studies) Early Valdivia Middens at Loma Alta, Ecuador  
 3:15 Gordon C. Pollard (State University of New York, Plattsburgh) Sedentism and Desert Adaptation in N. Chile  
 3:30 Donald A. Proulx (University of Massachusetts) Early Horizon Sites in the Nepena Valley, Peru  
 3:45 Donald R. Sutherland (University of South Carolina) Survey and Excavation of Habitation Sites in the Department of Santander, Colombia, July and August, 1970

(26) RESEARCH PAPERS: MESOAMERICA

Westward Room 4: Discussion Westward Room 5  
 A.M. Chairman: J. Charles Kelley (Southern Illinois University)  
 9:00 J. W. Bailey (Yale University) Early Classic Relief Sculpture at Tikal: Methods for Image and Glyptic Analysis  
 Joy Bilharz (Bryn Mawr College) Paleopathology in Rural Teotihuacan  
 Stanley H. Boggs (San Salvador) Preclassic Underground Ovens from Usulutan  
 Robert E. Greengo (University of Washington) Monochrome Ceramics of Northeastern Guerrero, Mexico  
 William J. Mayer-Oakes (Texas Tech University) Recent Excavations at San Jose, Ecuador  
 10:00 Suzanne Herman (New World Archaeological Foundation) Recovering an Early Classic Ritual Offering Pattern in the Ceramics from the Agua Azul Cenote  
 Darlene Glauner (New World Archaeological Foundation) The Cemetery Role of Elite Domestic Platforms. Archaeological Salvage of Mound 15 at Chipa de Corzo, Chiapas  
 Charles C. Kolb (Bryn Mawr College) Lowland Mayan and Oaxacan Influences in the Teotihuacan Valley  
 Ellen A. Kelley (Southern Illinois University) Excavations at the Chachihuites Ceremonial Center of Alto Vista, Zacatecas, Mexico  
 11:00 Olga F. Linares (Smithsonian Tropical Research Institute) Bariles, a Middle Formative Chiefdom and Its Role in the Socio-political Development of Western Panama  
 Harold W. McBride (Topanga, California) Middle and Late Preclassic Ceramics from Cuatitlan, Valley of Mexico  
 Arthur G. Miller (Yale University) The Archaeological Implications of the Architecture and Mural Painting at Tulum, Quintana Roo  
 George C. O'Neill (City College, CUNY) Archaeological Excavations in the Southern Valley of Mexico: Chalco, Xico, and Astahuacan  
 J. O. Palacio (British Honduras) A Brief Review of the Development of Archaeology in British Honduras  
 Louise Isen Paradis (Yale University) The Olmec Viewed from the Middle Balsas, Guerrero

David A. Peterson (Institute of Oaxaca Studies) Report on the Institute of Oaxaca  
Studies Isthmic Region Mapping Project

- 1:00 Robert B. Pickering (Southern Illinois University) Preliminary Report on Osteological Remains from Alta Vista, Zacatecas  
Olga S. Puleston (University of Minnesota) An Ancient Maya Workshop: Content and Function  
Ray T. Matheny (Brigham Young University) Archaeological Investigation of the Ancient Canal System at Edzna, Campeche  
Harold R. Shaw (Royal Ontario Museum) The "Ceremonial Bar" as a Clue to Maya Migration and Trade Routes  
J. Richard Shenkel (Louisiana State University, New Orleans) El Calon: A Monumental Shellmound in Southern Sinaloa  
2:00 Robert Sonin (Institute of Andean Studies) Resist Decoration of Maya Pottery  
George B. Thomas (New Jersey) Measuring the Pot-Hunter Factor: Uncontrolled, Selective Treasure Hunting and Controlled Surface Collection Near Mitla

## ABSTRACTS

Abascal-M, R. (Instituto Nacional de Antropología e Historia), G. Harbottle, and E. V. Sayre (Brookhaven National Laboratory) NEUTRON ACTIVATION STUDY OF THIN ORANGE. A number of sherds of "thin orange" of Teotihuacan, drawn from a broad range of Mesoamerican sites including Kaminaljuyu, have been analyzed for major and trace elements by the technique of neutron activation. The specimens have been arranged into groups based upon their paste-compositional patterns: the relationship of these groups to the archaeological setting of the Teotihuacan civilization will be discussed. (22)

Ackerman, Robert E. (Washington State University) ARCHAEOLOGY TODAY IN SOUTHEASTERN ALASKA. Preliminary testing of a 3 component site (GHB 2) in the Icy Strait region of S.E. Alaska in 1965 revealed an occupational sequence which extended from a late prehistoric-protohistoric phase of the Northwest Coast Tradition to a poorly defined beach encampment some 10,000 years ago. Prior research commitments to another research project prevented further investigation of the site until 1971. During the intervening years, several private and governmental programs had been advanced in an effort to utilize the timber, waterpower, mineral, and recreational potential of Southeastern Alaska. These proposed projects constituted a threat to archaeological sites. Before field research was reinstated, it was felt that the relevant organizations (Tlingit, State, and Federal) should be alerted to the dangers which were threatening the cultural heritage of the region. A broad range, informational paper, illustrating the dangers of expanded economic activity to the unstudied prehistoric and historic sites was submitted with a more specific proposal for a beginning research program. This paper will, in brief, outline the new data from the 1971 excavations, consider the prehistory of the Icy Strait region in terms of an areal overview, and delineate the nature of the working relationships between the Tlingit, State, and Federal agencies and our research project. Hopefully, this will serve as a partial contribution to the prehistory of S.E. Alaska and to the changing political aspects of archaeology today. (6)

Adovasio, J. M. (Smithsonian Institution) BASKETRY AS AN INDICATOR OF ARCHAEOLOGICAL FRONTIERS: A CASE STUDY FROM THE SOUTHWEST. Of all the artifact classes available to the archaeologist for analysis, perhaps none is as sensitive an indicator of population or cultural boundaries as basketry. No 2 populations ever construct basketry in exactly the same fashion, hence, detailed study of the distribution of techniques can be of great assistance in establishing archaeological frontiers in the past, provided suitable perishable remains are recovered. This paper summarizes the differences between Fremont and Anasazi basketry between A.D. 400-1300 and demonstrates precisely how the spatial limits of various basketry techniques may be used to establish regional boundaries between the 2 complexes. (8)

Agenbroad, Larry D. (Chadron State College) THE GEOLOGY OF THE GRASSHOPPER RUIN AREA, FORT APACHE RESERVATION, ARIZONA. A study of the lithic materials used at the Grasshopper Ruin near Cibecue, Arizona, reflects the knowledge of the geology of the region, and of the specific qualities of the raw materials. Stratigraphic analysis of the trenches placed in the ruins and adjacent areas reveal the sedimentary history during and post-occupation. (1)

Agenbroad, Larry D. (Chadron State College) A PALEO-INDIAN BISON KILL IN THE PANHANDLE OF NEBRASKA. Initial excavation of the Hudson-Meng Paleo-Indian site was begun in September, 1971. Work by volunteer labor continued until mid-November, when the site was closed for the winter storms and frozen ground. The discovery of an unusually large Scottsbluff point in situ in the ribs of one of the animals indicates association of the Plano complex and extinct bison. The bone bed is a single occupation event, representing a butchering floor activity near the actual kill site. Absence of skull fragments and lower long bones indicate quartering or halving the animals at the kill with transfer to the butcher area. Testing in the field season of 1971 indicates a site at least 35 meters by 15 meters, with the limits of the bone bed yet to be determined. (24)

Agenbroad, Larry D. (see Kelso, Gerald)

Aigner, Jean S. (University of Connecticut) STUDIES IN THE EARLY PREHISTORY OF NIKOLSKI BAY: 1937-1971. Nikolski Bay, Umnak Island, in the eastern Aleutians of Alaska has been the focus for diverse prehistoric studies and research since 1937. Then, Hrdlicka, working for the U.S. National Museum, first excavated a Nikolski Bay archaeological site. He also collected ethnographic information relating to the Aleut burial caves and metrically studied Aleut head form. Hrdlicka's initial inferences and hypotheses continue to configure research in the area. In this paper, the organizing theme is the early prehistory of Nikolski Bay, prominently its connection with the Bering Land Bridge. For this the archaeological record and ethnographic evidence become supporting context. The relevance of

study methods employed over time, the significance of finds for reconstructing New World migrations, multidisciplinary studies on living Aleuts, and the contribution of this information to general theory, are presented in brief form. (19)

Amsden, Charles W. (University of Manitoba) BUT WHAT HAPPENED IN BETWEEN? NUNAMIUT SETTLEMENT, COMMUNITY, AND EXPLOITATIVE PATTERNS—1900-1970. During the past 2 decades, anthropological studies among the Nunamiut Eskimos have dealt with descriptions of their contemporary culture or reconstructions for the period prior to 1900. To date, the time span between 1900 and 1950 has been virtually ignored, with the result that few details are known about changes in Nunamiut culture from its aboriginal to present state. Knowledge of these details can be valuable in constructing models of culture change among hunting populations. This paper reports some results of a recent analysis of Nunamiut settlement, community, and exploitative patterns for the period 1900-1970. Several major trends in these patterns are described, and explanations are offered in terms of changing conditions in the natural and social environment. (11)

Anderson, James (Cahokia Mounds Museum) THE CENTRAL ENCLOSURE. The east and south sides of a defensive enclosure around the central part of Cahokia have been located. The exact location of the enclosure was determined from aerial photographs taken in the early 1930's. The enclosure was rebuilt at least 3 times over a period of 200 years. The rebuildings show a change from round to square bastions. Some comments about the labor force and a days work as suggested by the data will be made. (10)

Anderson, James (Cahokia Mounds Museum) MOUND 72. Five years of research at Mound 72 will be summarized. The excavations began in 1967 to test the hypothesis that the mound was part of a N/S center line at the Cahokia site. Evidence of a large marker post was found at the eastern edge as predicted. The mound has produced nearly 300 burials, large caches of ceremonial artifacts, and information on mound construction. Several burial classes have been documented including sacrifices and individuals of high status. The artifacts suggest a trade network extending as far north as Wisconsin and as far south as the gulf coast. The mound was built in several stages, prior to its final form as a low linear mound, the mound was actually 2 independent structures. (10)

Anderson, Keith M. (National Park Service), E. Pierre Morenon, Olin F. McCormick III, and Kathleen Gilmore (Southern Methodist University) DEDUCTIVE STRATEGY AND SALVAGE ARCHAEOLOGY: AN EXAMPLE FROM EAST TEXAS. The results of survey and excavation in Lake Palestine reservoir, on the upper Neches river, are presented as an example of an attempt to apply deductive strategy in a salvage program. An ecological review, ethnohistorical records, and survey results were used to develop a series of predictions to be tested in excavation analysis. These predictions were intended to discriminate elements of Caddoan and Archaic settlement systems, provide background for a ceramic study of social stability in Caddoan hamlets, and test indirectly for economic change with the introduction of horticulture. It is argued that there is no inherent contradiction between deductive strategy and the goals of salvage archaeology, and that productive results can be obtained by testing hypotheses within the limits of single reservoir projects. (5)

Ayres, William S. (University of South Carolina) EASTER ISLAND PREHISTORY AND NEW WORLD-PACIFIC CONTACTS: RECENT RESEARCH. Recent archaeological research on Easter Island adds new information concerning the question of prehistoric contacts between the New World and this eastern-most extension of Polynesia. Structural stratigraphy in ceremonial centers on the island indicates a cultural continuity from the earliest settlement at approximately A.D. 400 to historic times. Evidence continues to point to a hiatus in religious activity around A.D. 1100 which remains to be explained. (8)

Bailey, J. W. (Yale University) EARLY CLASSIC RELIEF SCULPTURE AT TIKAL: METHODS FOR IMAGE AND GLYPHIC ANALYSES. The Early Classic hieroglyphs at Tikal are considered, with particular emphasis on a group of dated stelae which appears to show a change of title or name over a 50-year period. A new method of glyptic analysis is developed based on position, association, and repetition. (26)

Ball, J. W. (University of Wisconsin) A REGIONAL CERAMIC SEQUENCE FOR THE RIO BEC AREA. Three seasons fieldwork in the Rio Bec area of the Maya lowlands has produced a long sequence running from Chicanel-like pottery of the Preclassic to early Postclassic complexes. Special interest features of the sequence include the Early Classic ties to the southern traditions and the Late Classic ties to the north. Teotihuacan-linked ceramic traits show up in the sequence about the same time as the construction of the Becan fortress. Rio Bec style architecture, according to the ceramics, begins at least by 650 A.D. Other cultural-evolutionary and historical implications will be discussed. (3)

Belding, Richard N. (University of Texas) THE GALLINAZO PHENOMENON—VALLEY OR INTERVALLEY HEGEMONY? Utilizing the recent studies on Kotosh, Vicus, and Jequetepeque, together with the author's survey material from 10 North Coast valleys, it is possible to elaborate several constructs for the cultural significance of settlement and artifacts associated with the Viru culture in the Chicama Valley of Larco and the Gallinazo cultural phase in the Viru Valley by Bennett et. al. This paper proposes to examine the several constructs, presenting at the same time a resume of the late pre-Mochica developments on the North Coast. (25)

Benchley, Elizabeth (University of Wisconsin-Milwaukee) THE FIRST TERRACE OF MONKS MOUND. Excavations on the southwest corner of the first terrace of Monks Mound have revealed that this area was the location of intense building activities during the later phases of the Cahokia site sequence. The excavated area served first, around A.D. 1100, as the location of a series of large buildings and building complexes. Around A.D. 1200, it was the location of a series of small substructure mounds. The final prehistoric utilization of the area around A.D. 1300 resulted in a broad ridge of garbage fill extending from the southwest corner of the first terrace to the base of the third terrace. Final Indian utilization of the area was in historic times around A.D. 1700, when women and children were buried with French trade goods on the first terrace. The southwest corner of the first terrace of Monks Mound has yielded unique data on the intensity and nature of building activities during a period previously thought to have been the "decline" of Cahokia. (10)

Berger, Rainer (see Ericson, Jonathon E.)

Bettinger, Robert (see Thomas, David H.)

Bieber, Alan M., Jr. (University of Connecticut) STATISTICAL ANALYSIS OF STONE TOOL DISTRIBUTION AT THE ANANGULA BLADE SITE. The Anangula Blade site is an 8500-year-old village site on what was the south coast of the Bering Land Bridge. During the summer of 1970, 625 square meters of the site were excavated, revealing undisturbed materials representing a habitation of probably no more than 500 years. Several house pits were found, but due to acid soil conditions, only lithic materials were preserved. Of the more than 20,000 stone artifacts recovered, about one-third are recognizably either tools, cores, or tool blanks (as opposed to manufacturing debris). A computer-assisted statistical analysis was done of the distribution of these materials in order to define clusters of tool types which tend to occur together and to determine which types of tools tend to be found in which areas of the site. These data were used to define probable tool kits and activity areas, allowing hypotheses to be tested concerning spatial organization of the site and economic activities within the site. (19)

Bilharz, Joy, and Charles C. Kolb (Bryn Mawr College) PALEOPATHOLOGY IN RURAL TEOTIHUACAN. The human osteology from the Maquixco site in the Teotihuacan Valley, Mexico, includes both Aztec and Teotihuacan individuals. The material, excavated in 1961-62 by personnel of the Teotihuacan Valley Project, was primarily recovered from house midden, but includes a number of purposeful inhumations within residences. Standard osteometric techniques were utilized in an attempt to differentiate the 2 populations, and age and sex determined for the more complete specimens. Radiographs of pathologies permitted a more precise diagnosis of diseases. Emphasis is placed upon functional and cultural correlates of pathology. (26)

Binford, Lewis R. (University of New Mexico) DEMOGRAPHY-NUNAMIUT HUNTERS AND THE MALTHUSIAN ARGUMENT. The demographic history of the inland Nunamiut is discussed as a case study in the effects of sedentariness on fertility. The implications of this case will be explored as it may relate to hunters and gatherers in general. (11)

Birkby, Walter H. (Arizona State Museum) THE SKELETAL REMAINS OF THE GRASSHOPPER POPULATION. Over 450 skeletons of individuals have been exhumed to date from the Grasshopper site in Arizona. While this is not the largest skeletal series ever recovered from the Southwest, it is certainly one of the most carefully documented, best preserved, and complete collections available for comparative analyses. Data will be presented on the method of treatment of the material following excavation, and the types of analyses which have been undertaken or are in progress. In addition, plans will be given for future studies on this expanding skeletal population. (1)

Black, Robert F. (University of Connecticut) GEOLOGY AND ANCIENT ALEUTS: AMCHITKA, AND UMNAK ISLANDS, ALEUTIANS. Amchitka Island in the western Aleutians and Umnak in the eastern have had significantly different Quaternary histories. Amchitka Island has had no Quaternary vulcanism, but several raised marine notches demonstrate faulting and pronounced irregular uplift in pre-Wisconsinan time. Umnak has had frequent and extensive vulcanism probably throughout the Quaternary, yet tectonism seemingly has been significantly less frequent or important in the Quaternary. Both islands have experienced glaciation likely covering all land except possibly the highest volcanic peaks on Umnak, but the timing seems to have been different. Sangamonian deposits are recognized on Amchitka and are covered apparently without significant time break with till(?). An early Wisconsinan age seems indicated for the glaciation on the stratigraphic relations, induration, displacement by faulting and amount of marine notching of various uplifted blocks. No glaciers exist on Amchitka today. On Umnak no glacial deposits earlier than Late Wisconsinan have been recognized, but the island should have been glaciated earlier. An extensive ice sheet covered Umnak Island probably in Woodfordian time. A Neoglaciation about 3000 years ago saw the present restricted alpine glaciers expanded to the sea. Unconsolidated ash and organic soil sequences began forming about 10,000 years ago on both islands; gravity movements are much more pronounced on Amchitka today than on Umnak. Man was well established on Umnak Island 8400 years ago and stayed through the Neoglaciation without apparent adverse effects. If man were on Amchitka then, likely it was on the coast. All possible sites have been inundated or destroyed by marine erosion; only those a few thousand years old remain. (19)

Blanton, Richard E., Carl Kuttruff, and Dudley Varner (Rice University) SETTLEMENT PATTERN SURVEY AT MONTE ALBAN. A systematic surface survey of Monte Alban has been initiated, using the techniques employed by Rene Millon and William T. Sanders in the Teotihuacan Valley. One field season has been completed, during which time nearly 500 residential terraces and other features were located, mapped, and surface-collected. Conclusions regarding change through time of the size and configuration of the site can only be preliminarily stated at this time and are subject to change when the work is complete, but the following patterns have been noted: the site was a large, densely occupied urban center during the Late Monte Alban I phase (Late Formative); earlier, during the Early M.A. I phase, there were 2 or 3 discrete, small settlements near the top of the hill. The M.A. II period was a time of dense settlement, and, apparently, expansion. During the Early and Late Classic periods (M.A. IIIa and IIIb) the site continued as a large urban center, but possibly somewhat reduced in size and density of occupation compared to the M.A. II period. (13)

Boggs, Stanley (El Salvador) PRECLASSIC UNDERGROUND OVENS FROM USULUTAN. (abstract not received). (26)

Bohrer, Vorsila L. (University of Massachusetts, Boston) PREHISTORIC PLANT REMAINS. The distribution of the plant remains between room blocks tentatively suggests that those living in the latest constructed parts of the pueblo used a wider variety of wild products than those living in the earliest built segment of the pueblo. Pollen evidence suggests one pottery vessel contained a plant belonging to the lowspine Compositae, and that Cruciferae and other pollen types are so distributed as to suggest economic utilization. Inferences concerning the control of prime agricultural land, the types of habitats exploited, and the nature of the seasonal economic cycle will be discussed. (1)

Bolian, Charles E. (University of New Hampshire) THE USEFULNESS OF TEMPER AS A CRITERION IN CERAMIC TYPOLOGY. Temper has been used as a major criterion for the classification of ceramic artifacts by a number of archaeologists. At times, it has been credited with being both a cultural and chronological marker in the study of prehistory. Recent archaeological and ethnographic research in the Trapecio of Amazonas, Colombia, indicates that the primacy of temper as a major criterion for ceramic analysis should be reconsidered. Tukuna potters are currently using at least two and possibly three distinct kinds of tempering materials, according to personal preference. (22)

Bradbury, John P. (University of Minnesota) A DIATOM STRATIGRAPHY OF THE TEPEXMAN MAN SITE IN THE BASIN OF MEXICO. The witness section of lacustrine sediments at the Tepexpan Man site was exposed in 1969 to provide material for stratigraphic and paleoecologic analysis. It is now possible to refine our knowledge of late-Pleistocene and early-Holocene environments in central Mexico when man hunted a now-extinct megafauna, and to correlate this site stratigraphically with other areas in the Basin of Mexico. Diatom analysis of the 2.7-meter section of lacustrine and paludal sediments reveals the succession of aquatic environments at the edge of ancient Lake Texcoco where hunting activities were concentrated. Diatoms are siliceous algae that are sensitive indicators of water depth and salinity, and their stratigraphic record shows fluctuations in the ancient lake level, changes in water chemistry, and the influence of marginal freshwater marshes fed by the Rio San Juan Teotihuacan and other seasonal streams. The sediments contain 3 ecologically distinct diatom floras: (1) a brackish, open-water flora indicating a saline but comparatively lower lake levels, and (3) an alkaline, freshwater marsh flora. The diatom stratigraphy indicates a fluctuating transition from a brackish-water lake to a freshwater marsh that extended lakeward as water levels fell, presumably in response to a drying climate. Tepexpan Man lived at the beginning of the last marsh phase. The lower, fresher, water probably produced environments favorable for grazing herbivores near shore where the animals were hunted. (22)

Brandt, Keith (University of Wisconsin, Milwaukee) SETTLEMENT ANALYSIS—CAHOKIA AREA. The current state of research pertaining to settlement analysis within the American Bottoms, and its adjacent Bluffs is tended. It is reviewed according to the degree of relevance it has towards an understanding of the Cahokia settlement pattern. Thus, Late Woodland and Mississippian sites are discussed in detail, while those of other periods are largely sketched. The data was gained almost entirely from the results of 3 archaeological surveys. These were done by Alan D. Harn in 1961 and 1962, Patrick J. Munson in 1963, and this writer in 1971. Site locations densities, placement, composition, and patterns are discussed in relation to themselves, the American Bottoms as a whole, and to physiographic zones within it. One site, Metropolitan East St. Louis Mound Group, which is of particular interest and largely unknown is described. (10)

Browman, David L. (Washington University, St. Louis) PREHISTORIC PASTORAL NOMADISM OF THE JAUJA-HUANCAYO BASIN (CENTRAL PERU). Semi-nomadic pastoralism was practiced in the Jauja-Huancayo basin from possibly as early as 5000 B.C. until A.D. 550, when the valley was conquered and incorporated into the Huari empire. Preceramic assemblages nearly duplicate those reported by MacNeish for the Ayacucho region. During the Early Horizon, Chavin religious and political influence first bypasses the Central and Southern highlands. However, the Second Coming of Chavin, the Paracoid reformation, spreads widely and rapidly through the Central and Southern highlands, the locus of llama pastoralism in the Andes. (25)

Brown, Kenneth L. (Pennsylvania State University) BALL COURT CONSTRUCTION: ITS RELATIONSHIP TO CLASSIC SETTLEMENT PATTERN AND TEOTIHUACAN INFLUENCE IN THE VALLEY OF GUATEMALA. Mound excavation at Kaminaljuyu and surface survey within the Valley of Guatemala, have indicated that the ball court, as an architectural feature, makes its appearance during the Early Classic period, Aurora ceramic phase. At least 16 courts were found to be from the Early and Middle Classic, one of which (B-III-5 at Kaminaljuyu) was extensively excavated. This permits the construction of a model demonstrating the evolution of civic architecture within the Valley of Guatemala from the Terminal Formative through the Late Classic. Excavation has revealed that a regional architectural style was being practiced contemporaneously with the Teotihuacan-like architecture found at Kaminaljuyu. This has far reaching effects upon the determination of the nature of Teotihuacan influence and control both at Kaminaljuyu and in the Guatemalan Highlands. (13)

Bruhns, Karen Olsen (San Jose State College) PREHISPANIC LOST WAX CASTING MOLODS FROM CENTRAL COLOMBIA. The discovery of 2 lost wax casting molds in a tomb in the Department of Quindio in the Central Cordillera of Colombia has provided the first actual examples of this type of mold from a Preconquest site. Although it was known that lost wax casting was the technique used to make "Quimbaya" and other gold artifacts in Colombia, these molds further enlarge our knowledge of the processes involved in the making of metal objects. (21)

Buikstra, Jane E. (Northwestern University) THE LOWER ILLINOIS RIVER VALLEY: A REGIONAL PROGRAM IN THE EXCAVATION AND STUDY OF HUMAN SKELETAL MATERIAL (abstract not received). (9)

Bullen, Adelaide K. (see Bullen, Ripley P.)

Bullen, Ripley P., Adelaide K. Bullen, and E. Thomas Hemmings, Jr. (Florida State Museum) THE RIVER STYX MOUND. Recent digging of Owens-Illinois land near Micanopy, Florida, brought fragments of calcined bone to the surface suggesting a burial mound. Charles Stearns and Kevin Hollen of Gainesville brought this matter to the attention of the Florida State Museum and some salvage archaeology has been done at the site. Originally, it consisted of a small mound about 60 feet in diameter and, perhaps, 3 feet in height surrounded by an encircling embankment about 200 feet in diameter. Unfortunately the central portion was dug out many years ago. This mound is unique in that it is the only Florida mound known to us that has produced only cremations. We also have fragments of stone points that have gone through the crematory fire, copper beads, copper, and pottery. The last, suggests a late Deptford time period and the whole complex Adena-Hopewell influences. (9)

Burch, Ernest S., Jr. (University of Manitoba) THE "NUNAMIUT" CONCEPT AND THE STANDARDIZATION OF ERROR. Since the late 1940's, the Eskimo word "nunamiut" has been applied by researchers representing all subfields of anthropology to certain Northwest Alaskan Eskimos who spend (or spent) all or most of their time living away from the seacoast. Unfortunately, the first writers to use the term failed to grasp its correct meaning. They also failed to take into account the uniqueness of the historical situation of the Eskimos who first suggested it to them. The erroneous view that resulted became standardized, and it has been compounded during the nearly 25 years since it first appeared in the literature. "Nunamiut" not only fails to enlighten, it actually obscures most issues of interest to anthropologists concerned with the area, particularly for periods prior to the turn of the present century. In this paper, I will attempt to correct this state of affairs (1) by pointing out the flaws in the current, standardized view, and (2) by presenting an alternate picture that should prove more useful to social anthropologists and archaeologists alike. (11)

Cann, J. R., and N. Hammond (Center of Latin American Studies, Cambridge) TRACE ELEMENT ANALYSIS OF MAYA JADE SOURCES: PRELIMINARY RESULTS (abstract not received). (17)

Cazeau, Charles (see Scott, Stuart D.)

Charlton, Thomas H. (University of Iowa) THE SIGNIFICANCE OF AN HISTORICAL EVENT IN THE ARCHAEOLOGY OF THE VALLEY OF MEXICO. The application of the Meighan-Ascher seriation technique to excavated "Late Aztec" (III and IV) ceramics from the Teotihuacan Valley demonstrates that stylistically defined Aztec ceramics persist to 1650 and possibly 1720. This finding effectively extends the potential occupation of "Pre-conquest" Aztec sites located through surface surveys another 130 years. With this extension of the Aztec ceramic sequence and recent studies of the Codex Xolotl it is possible to suggest that the transition from Mazapan (Tula) to Aztec ceramics may have occurred during the thirteenth century and not earlier. This then lengthens the post Teotihuacan period in the Valley of Mexico. Postconquest archaeology in the Valley of Mexico is an integral aspect of any attempt to define the prehistoric sequence. Given Aztec ceramic continuity to at least 1650, August 13, 1521, is an obviously artificial cutoff point for archaeological studies. (13)

Chartkoff, Joseph L. (Michigan State University) SOME COMMENTS ON EMPIRICIST AND POSITIVIST APPROACHES IN ARCHAEOLOGICAL RESEARCH. A number of

journal articles in the past 2 years have generated a debate over central research strategies, methods and theoretical foundation in archaeological research. Somewhat inappropriately, the 2 rival positions have been labeled the empiricist, or narrow inductive, and the positivist, or processual, approaches to archaeological reasoning. The debate is compounded by unclear and sometimes inaccurate presentation of the conflicting world-views. Much of the differences between the rival schools are spurious. In particular the so-called narrow inductivist position is largely mythical, in spite of strong defenses by its proponents. It suggests that little, if any, professional archaeological research is conducted in the absence of problems or questions, which in turn dictate data recognition, collection, observation, and analysis procedures. This observation is intended to include salvage archaeology situations, despite the disclaimers of Chenhall and others. (5)

Chatters, James C. (University of Connecticut) **EARLY RUSSIAN IMPACT ON THE ALEUT POPULATION.** In the late 1930's Hrdlicka concluded that a population of brachycephalic "Aleuts" had replaced the earlier dolichocephalic "pre-Aleuts" over much of the Aleutian chain. Since then, although wholesale migration has been discounted, there is increasing evidence that the rapid change in cranial vault form in selected areas was due in part to population movements. Statistical analysis of archaeological remains recently excavated from the west end of Chaluka village mound, Umnak Island, has produced strong evidence with respect to the hypothesis that another Aleut isolate, slightly varying physically and culturally, supplanted the old isolate at this site within the last 2 centuries, a move possibly stimulated by early Russian traders. (19)

Chavez, Sergio J. (Institute of Andean Studies) **ARCHAEOLOGICAL RECONNAISSANCE IN CHUMBIVILCAS (CUSCO), PERU.** A complete report of surface reconnaissance, carried out in the summer of 1971, in the little known province of Chumbivilcas in the Department of Cusco (Peru), will include the presentation of 7 newly discovered carved monoliths all related to the Pucara culture. One of these monoliths is unique in showing carved elements which closely relate to those on Pucara pottery from sites in Puno. The relationship of these pieces of stone sculpture to others in the altiplano will be given. The second part of the presentation includes the description of a new site having an occupational extension of 10 kilometers. Materials collected from the surface show a long sequence of occupation there since preceramic times. (25)

Cheek, Annetta L. (University of Arizona) **A TYPOLOGY OF ARTIFACTS FROM HISTORIC ABORIGINAL SITES.** Quimby (1966) proposed a typology of historic artifacts. Based on his idea, and on componential analysis, I have constructed a classification of Indian-made historic period artifacts. It is hoped that the use of this classification will aid in the analysis of the nature and extent of change that has occurred in the aboriginal culture. (8)

Cheek, Charles (University of Tulsa) **POLITICAL THEMES ON MESOAMERICAN STELAE.** Berlin, Proskouriakoff, and Kelley have pointed out that some stelae in the Maya region depict political scenes. They were able to identify distinct personages and places through the use of name glyphs. It may also be possible to derive socio-political information from stelae that do not have glyphs or whose glyphs are not currently decipherable. This can be done through the study of features that may function as symbols of cultural identity, such as style of dress, personal ornament and ideals of beauty. The stelae from the Cotzumalhuapan region of Guatemala are presented as a case study. (14)

Chenhall, Robert G. (University of Arkansas) **RELIABLE DATA CONTROL FOR MULTI-SITE RESEARCH.** Archaeologists, along with other scientists, today are engaged in a self-conscious reappraisal of their objectives and methodology. However, with few exceptions, archaeologists have not yet recognized that an explicitly scientific approach will demand a sophistication in the methods used to obtain and control data that is at least as revolutionary as the newer research designs. Examples are given to illustrate the role of scientific instrumentation in archaeological research, and the computerized data bank is presented as a necessary tool for reliable data control in multi-site research. (4)

Clark, Donald W. (National Museum of Man) **THE EARLIEST PREHISTORIC CULTURES OF KODIAK ISLAND, ALASKA.** Antecedents of the first settlers of Kodiak Island probably had made a maritime hunting adaptation shortly prior to colonizing the island group. Thus the earliest Kodiak phases should be related to other early Alaskan maritime cultures. Ocean Bay I and II, which date from ca. 1500 B.C. to 3500 B.C., were discovered in 1963 and were further investigated in 1971. The 2 phases are characterized respectively by flaked chert and sawn/ground slate technology and together show the inception and ascendency of slate working in the regional chronology. Although Ocean Bay I is not necessarily the earliest occupation, it presently will be so regarded since no evidence otherwise has been found on Kodiak. This phase has a nearly identical contemporary counterpart, Dumond's Takli Alder, also without known antecedents, located on the adjacent Alaska Peninsula. Later phases of the Peninsula and Kodiak diverge somewhat although they show many cross-ties. There is no apparent close relationship to proto-Eskimo, early Aleut, or early Northwest Coast cultures, although trait correspondences with the last are striking and ultimate relationships may lie with the latter 2 of these. (19)

Clark, Donald W. (see Macfadyn, A.)

Clark, G. A. (Arizona State University) **THE ASTURIAN OF CANTABRIA: A REEVALUATION.** Research conducted in 1969 in the north Spanish provinces of Asturias and Santander is described. Investigation focused on the Asturian, a post-Pleistocene coastal adaptation radiocarbon dated from 7000 to 8900 B.P. The Asturian has been virtually ignored by Spanish prehistorians since the 1930's; it was held to be characterized in the past by a crude lithic industry here shown to be the result of sampling error. Chronological problems developed since the 1930's are evaluated and a lithic typology established for the industry as a whole. Sparse evidence for intersite variation is discussed. Copious faunal remains and supposedly related artifactual material in Galicia and in Portugal are also evaluated. (8)

Clausen, Carl J. (Bureau of Historic Sites and Properties, Florida) **UNDERWATER EXCAVATIONS AT LITTLE SALT SPRING AND WARM MINERAL SPRING, FLORIDA** (abstract not received). (8)

Cieland, Charles E. (Michigan State University) **CURRENT RESEARCH IN THE TRAVERSE CORRIDOR OF NORTHWESTERN MICHIGAN.** A review of 5 years of archaeological research undertaken by Michigan State University in northwestern lower Michigan. Information from 35 late Woodland sites located within the ecological and physiographic confines of a narrow coastal corridor bordering Lake Michigan reveals new settlement systems data. Tentative conclusions relevant to environmental factors influencing site placement and the relationship between sites will be reviewed. (9)

Clewlow, C. William, Jr., and Patrick S. Hallinan (University of California, Berkeley) **THE SALVAGE PROBLEM, PRIVATE ENTERPRISE, AND THE CRISIS IN AMERICAN ARCHAEOLOGY.** The problems of salvage archaeological programs on state and federal-controlled lands may be seen as part of the larger perspective of crisis in American archaeology. Several institutional features of the private enterprise system are examined for their impact on the practice of archaeology in the United States. Negative and positive features are discussed; proposals are offered to inhibit negative tendencies and to enhance positive ones. (16)

Cohen, Mark N. (State University of New York, Pittsburgh) **POSSIBILITIES AND LIMITS IN THE QUANTITATIVE ANALYSIS OF ORGANIC RESIDUES.** Recent work in the quantitative analysis of plant and animal remains for a region of the Peru Coast indicate that a number of theoretical and practical problems are encountered which prevent reliable dietary quantification even when "excellent" preservation is encountered. The paper will express doubts about statements of the relative quantities of various food items in the diet while suggesting other, more limited applications of quantitative analysis. (17)

Cole, John R. (Columbia University) **TRANS-ANDEAN CONTACT: PRECERAMIC AND OTHER LITHIC EVIDENCE.** Lithic artifacts examined for evidence of relationships between Pre-Columbian coastal and inland sites suggest intriguing possibilities. T-shaped axes, typical of forest cultures, are found in coastal Ecuador and Peru. Artifacts similar to coastal Vegas are reported from Colombia. Some coastal artifact traditions can be traced to Highland areas peripheral to Amazonia although direct Amazonian contact evidence is often lacking. Evidence of diffusion and/or migration via intermontane routes suggests at least indirect contact, with outlets to Amazonia and the coast passable both directions. 10,000 years of Transandean interaction is thus suggested by evidence of varying directness and certainty. (12)

Collins, Michael B. (see Wilcox, David R.)

Cook, John P. (see McKennan, Robert A.)

Corbin, James (Washington State University) **EARLY HISTORIC NUNAMIUT HOUSE TYPES.** Recent excavation of a small village site (Aniganigurak) at the western end of the Atigun Canyon in the eastern Brooks Range has uncovered a number of dwelling structures. Since the site was obviously Eskimo and historic, the available ethnographic literature on the Nunamiut Eskimo was consulted in an attempt to identify the structures as to type, function, and methods of construction. Compilation of these data, those derived directly from the people of Anktuvuk Pass, and from conversations with researchers in the area, allowed the reconstruction of 2 primary house types, the ivrulik and the itchelik. (11)

Cotter, John L. (see Malone, Patrick M.)

Cowgill, George L. (Brandeis University) **SYSTEMS, LAWS, PARADIGMS, AND GOOD IDEAS.** It has been argued that there is a "dialectic" between archaeologists who follow a "logico-deductive" paradigm that leads them to think in terms of linear causality and Hempelian covering laws, versus those who think in terms of systems concepts. The first approach supposedly stems from physical science paradigms and the second from those in the biological sciences. Actually, most archaeological applications of ideas from either physical or biological sciences are still programmatic or fairly rudimentary and any debate between only these 2 alternatives obscures the main point. It would be good to understand the concepts in these other fields better, but we should not let preoccupation with them make us minimize the ways in which social/cultural entities are not like either biological or physical systems, or draw our attention from other sources of good ideas. (5)

Crabtree, Don (Idaho State University) SOME COMMENTS ON ARTIFACT EDGE ANGLES. The obtuse angle as a function edge will be discussed, and the differences explained between intentional grinding of artifact margins by the worker and the abrasion on edges due to function. (7)

Davis, Leslie B. (Montana State University) THE EFFECTS OF OBSIDIAN COMPOSITIONAL TYPES ON HYDRATION RATE VARIATION (abstract not received). (17)

Dean, Jeffrey S., and William J. Robinson (University of Arizona) DENDROCHRONOLOGY OF GRASSHOPPER PUEBLO. Nearly 1300 tree-ring samples were recovered during the excavations at Grasshopper. From these, 106 dates have been derived to form the basis for the absolute dating of the pueblo. The dates range from A.D. 1090-1366, with a maximum clustering between A.D. 1280-1340. The collection is dominated by 5 arboreal species, all of which occur in the present environment of Grasshopper. Temporal and spatial distributions of the species serve as the basis for inferences regarding the use of certain species in functionally-specific contexts. Observed shifts in frequency of species through time are attributable to either cultural or environmental variables. Dendroclimatic techniques of analysis provide information regarding the paleoclimate of Grasshopper Pueblo during and preceding its occupation. Index-departure values (Robinson and Dean 1969) suggest that the climatic conditions during the so-called Great Drought of the late thirteenth century were less severe at Grasshopper than in other areas of the Southwest. This period was followed throughout the Southwest by a century that was characterized, according to the dendroclimatic model, by cooler and wetter conditions. (1)

DeBlois, Evan I. (U.S. Dept. of Agriculture, Forest Service) THE FIRST SEASON OF THE ELK RIDGE ARCHAEOLOGICAL PROJECT (abstract not received). (18)

Dickson, D. Bruce (School of American Research) SURVEY AND SAMPLING. In an effort to explain settlement pattern changes through time in the middle Northern Rio Grande area, a site survey was performed on a transect laid out in a portion of that area south of Santa Fe, New Mexico. Within this transect, which ran west from the Sangre de Cristo Mountains to the Rio Grande, areas to be surveyed were selected on a stratified random basis in an effort to avoid systematic error. Using the information thus collected as a control, previously recorded site information for the middle Northern Rio Grande area was utilized in the construction of a tentative model of site location in that part of New Mexico. Finally, a series of potentially testable hypotheses were generated to explain change in that model through time. (5)

Dixon, E. James, Jr. (University of Alaska) THE GALLAGHER FLINT STATION, AN EARLY MAN SITE, NORTH SLOPE, ARCTIC ALASKA. The Gallagher Flint Station is located in the arctic foothills province approximately 20 miles north of the Brooks Range on the upper Sagavanirktok River drainage in northern Alaska. Two distinct localities are recognized within the site. Locality I exhibits a generalized core and blade industry which lacks both burins and bifacial stone tools. The only radiocarbon date from this locality is 8590 B.C. plus or minus 150 years. No distinction can be made between blades and micro-blades on the basis of width or width/thickness ratios, and rotated cores are common. Locality II demonstrates a bifacial stone industry as well as burins. Two radiocarbon dates from this locality are 175 B.C. plus or minus 70 years and A.D. 1045 plus or minus 30 years. Because of the surface nature of the site, there may be some mixing of the components. The site's Locality I may demonstrate some of the oldest evidence for the presence of Aurighocoid industries reaching North America from Siberia at the close of the Wisconsin during late land bridge times. (24)

Dixon, E. James, Jr. (see Holmes, Charles E.)

Doelle, William, and Edward B. Sisson (Robert S. Peabody Foundation for Archaeology) POSTCLASSIC ARCHITECTURE OF THE TEHUACAN VALLEY, PUEBLA, MEXICO; A PRELIMINARY ASSESSMENT. During the 1971 field season of the R. S. Peabody Foundation's "Proyecto Coxcatlan," portions of 9 small to medium-sized structures ranging in date from Early to Late Postclassic were excavated. These structures are described and compared with comparable Postclassic structures from other areas. Construction techniques and possible functions are discussed. (13)

Donnan, Christopher B. (University of California, Los Angeles) A PRECOLUMBIAN SMELTER FROM NORTHERN PERU. An exquisitely modeled ceramic bowl from the North Coast of Peru, dating to ca. A.D. 600, provides a glimpse of ancient metallurgical technology as it was practiced a full 900 years before the arrival of the Europeans. (21)

Druss, Mark (Columbia University) ENVIRONMENT, SUBSISTENCE ECONOMY, SETTLEMENT PATTERNS OF THE CHINCHIN COMPLEX NORTHERN CHILE. During 1970-71 research on the relationship between small-scale environmental change, subsistence economy, and settlement patterns of the late Preceramic Chiu-chiu complex was carried out in the Calama region of the Atacama Desert, northern Chile. Fieldwork consisted of excavation at 5 sites, yielding data on subsistence economy, settlement pattern, environmental change, chronological position, and, to some extent, on the season and degree of permanence of habitation at each site. Aerial and terrestrial exploration provided some understanding of

the subsistence potential of the zone and aided in the location of likely resource areas. Site prospecting in altiplano and highland sectors was conducted in order to test hypotheses about seasonal transhumance. Local game, including guanaco (*Lama glama guanicoe*), was hunted and skinned to provide data on game ranges and habits as well as osteological samples for comparative purposes. Modern floral samples were also collected. We were able to observe the short-range effects of a minor wet fluctuation of the climate and were thus provided with an heuristic example of climatic change and the relationship between increased precipitation, cloud cover, temperature, evaporation rate, vegetational changes, and changes in game ranges. (25)

Duffield, Lathel F. (University of Kentucky) DETERMINING THE AGE AND SEX OF THE POST-CRANIAL SKELETON OF BISON. The age (at the time of death) of postcranial elements of bison can be determined roughly by the use of a chart showing the age of epiphyseal closure. Sex of certain post-cranial elements can be determined on the basis of measurements and indices. (8)

Eaton, Jack D. (Tulane University) CHICANNA: AN ELITE CENTER IN THE RIO BEC REGION. The ruins of Chicanna lie approximately 2.5 kilometers southwest of Becan and are a complex of mounds and monumental buildings forming a main plaza group and peripheral court groups. These are the ruins of an elite ceremonial center which are principally of Late Classic construction, but with some Early Classic substructural remains. There is a thin underlay of late Preclassic material which represents what is believed to be the earliest occupation of the site. (3)

Edwards, William Ellis (Temple Buell College) THE SYNCHRONITY OF DEGLACIATION AND MEGAFAUNAL EXTINCTION. At least 6 hypotheses suggest a causal rather than chance relationship between deglaciation and extinction. Most extinction did not ensue from simple megafaunal non-adaptability to (1) climatic change or (2) parasites crossing a vanished ice barrier. (3) In Indonesia and other areas, deglaciation caused island formation and, through several mechanisms, extinction. (4) Deglacial climatic change, especially in enlarged areas of more optimal "challenge," perhaps directly stimulated cultural evolution, but only moderately. (5) The most extensive extinctions apparently required expanding economies, for which motivation was insufficient in postulatedly parasitism-limited, Last Glaciation, tropical-subtropical Old World humans, and opportunity was insufficient farther north. During deglaciation arose an appreciable, food-limited temperate zone with adequate motivation and opportunity. (6) Alternatively, the Last Glaciation temperate zone comprised suitable but small, semi-isolated "islands," which expanded and coalesced with deglaciation; with increased area, population, and interchange, cultural evolution accelerated. (7) Tropical-temperate populations were territorially limited, but with deglaciation, expanding (by environmental change plus culture), non-territorial, food-limited subarctic bands experienced adequate motivation (increasing starvation mortality) and opportunity (non-game food abundance and diversity), with extinction-associated spread into adjacent temperate areas and throughout America. Selecting between hypotheses (5), (6), and (7) must await additional data and analyses. (24)

Elias, Joel N. (see Ford, Richard I.)

Ericson, Jonathon E., and Rainer Berger (University of California, Los Angeles) OBSIDIAN HYDRATION DATING: FURTHER STUDIES ON THE CHEMICAL AND PHYSICAL PARAMETERS AFFECTING THE HYDRATION RATES OF OBSIDIAN. The chemical and physical factors influencing the hydration rates of obsidian artifacts are reexamined. Several induced hydration experiments on California obsidians were conducted. The results and their interpretation will be presented. (17)

Ericson, Jonathon E. (see Hagan, Timothy A.)

Faulkner, Charles H. (University of Tennessee) MIDDLE WOODLAND SUBSISTENCE-SETTLEMENT SYSTEMS IN THE MIDDLE SOUTH: A HYPOTHETICAL MODEL. The study of the subsistence-settlement systems of Middle Woodland cultures in the Great Lakes-Riverine area has focused attention on the regional variability of Middle Woodland groups participating in the Hopewellian Interaction Sphere and their adaptation to distinct environmental regions of the eastern United States. One of these regions is located in the Interior Low Plateaus physiographic province of the Middle South. Lacking evidence of intensive agriculture, the cultural complexity witnessed in this region during the Middle Woodland period is best explained by maximum exploitation of the natural environment. (15)

Findlow, Frank J. (University of California, Los Angeles) THE ACCURACY PROBLEM AND HYDRATION DETERMINATIONS UNDER 2 MICRONS. One of the most serious problems hampering the development of hydration dating systems for many parts of the world is the problem of loss of accuracy when dealing with hydration determinations under 2 microns. To alleviate this problem, a method of photographic enlargement has been developed to ensure accuracy when reading hydration bands smaller than 2 microns. (17)

Fitzhugh, William (Smithsonian Institution) THE CIRCUMBOREAL HYPOTHESIS REVISITED: NEW DATA AND INTERPRETATIONS FROM THE NORTH ATLANTIC

**LITTORAL.** A recent survey of Scandinavian museum collections of the Younger Stone Age has resulted in a new approach to the circum-polar diffusion hypothesis of Giessing and Spaulding. Despite the remarkable chronological and functional correlations which exist between the maritime-adapted cultures of Scandinavia and northeastern North America, no substantial indications of contact are noted. However, analysis of their respective environments and adaptations suggests a number of important questions regarding functional and cross-cultural development of maritime adaptations in prehistory. In particular, their role in cultural evolution is discussed, with ethnological and archaeological data presented, and a proposal for more prominent attention of archaeologists to cross-cultural studies of maritime adaptations and their relationship and functional equivalency in agricultural societies. (6)

Flayhardt, R. A., and Elizabeth Ann Morris (Colorado State University) **THE T-W DIAMOND SITE, A STONE RING LOCALITY IN NORTH CENTRAL COLORADO.** The Colorado State University Archaeological Field School excavated the T-W-Diamond site, a stone ring locality in north central Colorado during the summer of 1971. The site was located on top of a ridge in the foothills near a spring in an adjacent canyon. Seventeen circles were excavated or tested out of a total of 41. The presence of hearths and the location of artifacts on barely discernible floors indicated that this was a habitation site. Artifactual material was scarce and included side-notched and triangular projectile points, several types of knives and scrapers, a pipe stem fragment, and a few potsherds. Cultural affiliations are thought to have been Shoshonean. It is postulated that the site was occupied seasonally for short periods of time by nomadic groups exploiting a pattern of diverse based subsistence. (8)

Fleinenken, J. J., and M. D. Mandeville (Iowa State University) **A COMPARISON OF FLAKING QUALITIES OF NEHAWKA CHERT BEFORE AND AFTER THERMAL PRE-TREATMENT.** Twelve bifaces were made from paired preforms, 6 were retained as controls, and 6 were heat treated by aboriginal techniques. The difference in flaking quality is discussed and comparisons are made of the debitage. (17)

Fletcher, Charles S. (State University of New York Agricultural and Technical College). **THE ECOLOGY OF POTTERY—THEN AND NOW.** Archaeological analyses of ceramic characteristics such as design, decoration, and form have usually been concerned with inferential data regarding chronology, cultural development, diffusion, contact, conquest, population movements, social organization, etc. However, little attention has been paid to the ecology of ceramics in terms of the suggestions made by Frederick Matson in 1966. This situation is probably due in part to the difficulty of recovering such information in archaeological contexts. In the Basin of Mexico, a unique opportunity exists for the study of the ecology of archaeological ceramics. We have used information from sixteenth century pictorial manuscripts and other ethnohistorical sources, in combination with modern ethnographic data, to arrive at some conclusions regarding the ecological rationale of continuity and change in ceramic form, decoration, and manufacture. (35 mm slides) (4)

Forbis, Richard G. (University of Calgary) **THE MAJORVILLE CAIRN AND MEDICINE WHEEL, ALBERTA.** The Majorville Cairn on the plains of southern Alberta is a conical mound some 20 feet in diameter and 4 feet in height. It is surrounded by a circle of stone about 90 feet in diameter, which is connected to the cairn by a series of regularly-spaced spokes of stone. The number of spokes suggests the possibility that the site may have served as a lunar notation station. (8)

Ford, Richard I., and Joel N. Elias (University of Michigan) **TEOTIHUACAN PALEO-ETHNOBOTANY.** The subsistence basis of the Classic period city of Teotihuacan has long been an unresolved question in Mesoamerican prehistory. For the first time, flotation samples of carbonized plant remains, collected by Rehe Millon as part of the Urbanization at Teotihuacan Project, yield a preliminary answer. In addition to the cultigens, the inhabitants of the urban zone were utilizing a variety of gathered wild plant products which appear to have contributed extensively to their diet. Furthermore, an analysis of the environmental requirements of food plants and of trees used for firewood provides important information about land use patterns in the Teotihuacan Valley. (22)

Fowler, Melvin L. (University of Wisconsin, Milwaukee) **AERIAL ARCHAEOLOGY AT THE CAHOKIA SITE.** Fifty years ago, the first aerial photos were taken of the Cahokia site. Since that historic event, many air photos have been made specifically for research. These include panchromatic, infrared, and color infrared (false color). The month of February seems to give the best results for interpretation, due to the bareness and saturation of the soil. Many archaeological features have been discovered from air photo interpretation. These include palisade lines and locations of mounds that have been destroyed. Aerial photogrammetry has been utilized for contour mapping of the site. Aerial photography is an indispensable tool for large site archaeology. It should be done well in advance of any proposed surface archaeological studies and excavations. Data can be gained from air photo interpretation that makes for much more effective field work. (2)

Fowler, Melvin L. (University of Wisconsin, Milwaukee) **THE CAHOKIA MAPPING PROJECT: GOALS TECHNIQUES, AND RESULTS.** For the past 6 years, the University of Wisconsin, Milwaukee, has been conducting archaeological research at the Cahokia site near East St. Louis, Illinois. This project has been financed by the National Science Foundation.

The goals of the project have been: (1) To prepare a physical and cultural map of the Cahokia site; (2) To define the site limits; (3) To define the nature and character of the site as a community; and, (4) To determine the nature of specialized areas within the site. The techniques used in this project have been aerial photogrammetry, air photo interpretation, controlled surface collections, and standard excavation techniques. The project has resulted in a better understanding of the site's complexity and extent. Much of this research is summarized in the papers of this symposium. (10)

Fowler, Melvin L. (University of Wisconsin, Milwaukee) **SUMMARY AND INTERPRETATIONS: CAHOKIA MAPPING PROJECT.** Some comments are offered regarding the size of population, complexity and level of social-cultural integration of the Cahokia site. Some suggestions are offered as to community organization. The possible contributions that Cahokia data can offer to our understandings of the processes leading toward complex community development will be discussed. (10)

Frisbie, Theodore R. (Southern Illinois University) **THE CHACOAN INTERACTION SPHERE: A VERIFICATION OF THE POCHTECA CONCEPT WITHIN THE SOUTHWESTERN UNITED STATES.** A processual model is employed to indicate that a Mexican-derived Pochteca group organized an interaction sphere within Chaco Canyon during the eleventh century. It is hypothesized that this group directed operations at related sites outside of the core area, and that exploitation of raw materials through colonization and mobilization of local populations were major objectives. (18)

Frison, George (University of Wyoming) **EVIDENCE FOR USE ON TOOL ASSEMBLAGES FROM PLAINS BISON BISON AND BISON ANTIQUUS BUTCHERING SITES.** Bison bison and *Bison antiquus* kills produce simple but functional tool assemblages along with butchering evidence on bones. Stone tools were used for functions of cutting, chopping, and rushing. Evidence indicates that bone tools were also important in butchering processes. Analysis of butchering works on bones and wear patterns on tools from sites and those used experimentally support these hypotheses. (7)

Fryman, Frank B., Jr. (Bureau of Historic Sites and Properties) **BUILDING AN ARCHAEOLOGICAL DATA BANK: PROGRESS REPORT FROM FLORIDA.** Florida's Division of Archives, History and Records Management (which includes the State Archaeologist's office) has undertaken to establish a computer data bank for storage and retrieval of the archaeological, historical, and museum data accumulated through its various programs. Included in this data bank will be the data on all known land and underwater archaeological sites, recorded historical sites of significance, and, in addition, the data on all museum items acquired for Florida's State Historical Museum. Ultimately, the data bank is to serve as a repository for coordinating all such data throughout the state, providing the means for integrating and then disseminating this data. (17)

Fullem, Bruce (University of Connecticut) **ANALYSIS OF THE ANANGULA CORES AND TABLETS.** A technological investigation of the unusually large number of cores and tablet flakes from the Anangula collection is attempted to reveal the technological, behavioral patterns. It is hoped that social groupings will also be identified by the relationship between workshop areas and houses. A third area of investigation will be an attempt to estimate the degree of lateralization in this prehistoric population. This will be done by using evidence of rotation of cores and tablet flakes and linking this data with other evidence of handedness. (19)

Fuller, John W. (University of Washington) **DEVELOPMENT OF NUCLEATED COMMUNITIES DURING THE LATE PREHISTORIC PERIOD IN WEST VIRGINIA.** Research activities in northern West Virginia by R. C. Dunnell and John W. Fuller have been concentrating on the manner of change in community form marking the Woodland-Late Prehistoric transition. At present, the structure of Woodland communities is believed to be small dispersed hamlets, and that of Late Prehistoric communities is known to be large nucleated towns. Present research activities will first determine the structure of the Woodland communities and then establish the process operative in town development by surface survey and controlled surface collection. (9)

Furst, Peter T. (State University of New York, Albany), and Stuart Scott (State University of New York, Buffalo) **AN ETHNOGRAPHIC-ARCHAEOLOGICAL PARALLEL FROM WESTERN MEXICO.** In the course of archaeological fieldwork in the coastal Marismas Nacionales de Sinaloa and Nayarit in 1971, Scott visited and photographed Los Monos, an important and barely accessible petroglyph site in the lower altitude western mountain zone of the Sierra Madre Occidental. Los Monos consists of a series of rocky plunge pools, with the rock art located in the deepest part of the ravine. No archaeological remains were located that might shed light on the cultural associations of the rock art. However, a dominant motif on the east wall depicting a sun with rays in association with a ladder design was found by Furst to correspond to an important element in Huichol cosmology and mythology, relating to the mythic birth and daily journey of the Sun Father across the sky and through the Underworld. (13)

Gaines, Sylvia W. (Arizona State University) **COMPUTER APPLICATION IN AN ARCHAEOLOGICAL FIELD SITUATION** (abstract not received). (1?)

Gardner, William M. (Catholic University of America) COMPARISON OF A "COMMUTER" AND A "RESIDENTIAL" FIELD SCHOOL. Two archaeological field school situations will be compared and evaluated. The first of these involved daily commuting near Washington, D.C. The second was in the Shenandoah Valley on Paleo-Indian sites and involved communal living with a group of 40 people including National Geographic Society research grant staff, 20 students in the field school and several high school volunteers. There were tremendous differences between the 2 in such areas as group rapport, interest, learning environment, social relations, publicity, and overall results. (20)

Gilmore, Kathleen (Southern Methodist University) THE ISOLATION OF SOCIAL GROUPS AMONG PREHISTORIC CADDO BY CERAMIC ATTRIBUTE ANALYSIS. Research was designed to test for evidence of social distance and economic independence among 8 sites of the prehistoric Caddo on the upper Neches River, Texas. Attribute analysis of sherds from these sites was made by using techniques of execution and design motifs. The analysis was put on punch cards and computerized in an attempt to arrive at the amount of female mobility among the villages and thereby the nature of the social group from which the women were drawn. (17)

Gilmore, Kathleen (see Anderson, Keith M.)

Glauner, Darlene (New World Archaeological Foundation) THE CEMETERY ROLE OF ELITE DOMESTIC PLATFORMS; ARCHAEOLOGICAL SALVAGE OF MOUND 15 AT CHIAPA DE CORZO, CHIAPAS, MEXICO (abstract not received). (26)

Glennan, William S. (University of California) THE MANIX LAKE LITHIC INDUSTRY—EARLY LITHIC TRADITION OR WORKSHOP REFUSE? The question of the type of activity pattern reflected by the Manix Lake Lithic Industry has led to some degree of controversy. Some researchers feel that these crude lithic specimens are finished tools and evidence of very early human occupation in the New World, on the order of plus 20,000 years B.P. Others feel that the specimens are roughly flaked because they are only blanks and discards of refined biface production. In an attempt to support one of these contending hypotheses, a study was undertaken. Some tentative conclusions can be drawn based on a reexamination of the published reports and original collection of specimens, the collection and study of new materials, and the location of the sites themselves. The evidence present today supports the hypothesis that the Manix Lake Lithic Industry specimens are rejects and discards and do not represent fully finished stone tools. The sites are probably workshop areas. There is no supportive evidence that these materials reflect the survival of some sort of Old World Handaxe or Asian Chopper-Chopping Tool Tradition. (17)

Graybill, Donald A. (University of Arizona) FACTOR AND CLUSTER ANALYSES: COMPARISON, APPLICATION, AND ARCHAEOLOGICAL UTILITY. The widespread availability of particular computer programs for multivariate analysis provides prehistorians with a relatively new basis for precise comparability of method and repeatability of manipulative experiments. Several variations of factor and cluster programs in the BC-TRY system and the Computer Contributions of the Kansas State Geological Survey are utilized with African paleolithic assemblages in consideration of analytic differences and utilities. Assumptions concerning the nature and suitability of data sets are examined. It is concluded that future publications in treatment of topics of this nature would enhance communication within the discipline if precise descriptions of data sets, statistical techniques, computer programs, and options or default values within these were provided. (5)

Green, Ernestine (Western Michigan University) LOCATION ANALYSIS OF PRE-HISTORIC MAYA SITES IN NORTHERN BRITISH HONDURAS. This paper examines the spatial distribution of prehistoric Maya sites in Corozal District, northern British Honduras. The method is to isolate characteristics of the environment and to test their correlation with settlement distribution. Tests include multiple regression and percentage point difference. By using both tests, it is possible to determine which characteristics were relevant to the selection of a location for settlement, their relative importance, and their order of importance. The analysis indicates that variables of soil, vegetation, and distance from navigable water are significantly associated with settlement. (14)

Greene, Jerry L. (see Mathews, Thomas W.)

Greengo, Robert E. (University of Washington) MONOCHROME CERAMICS OF NORTHEASTERN GUERRERO, MEXICO. Decorated pottery and figurines usually serve as primary data in establishing spatial-temporal networks in archaeological studies. However, for most ceramic complexes in Mesoamerica the largest samples are of monochrome wares. With sufficiently sensitive attributes, study of monochrome wares may provide partially independent alternative interpretations. The hypothesis that monochrome wares have a more fundamental relationship to subsistence and habitation patterns leads to the postulate that monochrome pottery may better reflect certain cultural processes related to rate and nature of change. Through comparison of patterns in monochrome wares within and between regions, more precise evaluations may be made as to the roles played by variations within a tradition (evolution) and those acquired from other traditions (diffusion). (26)

Gregg, Michael (University of Wisconsin, Milwaukee) BIOLOGICAL RESOURCE BASE AND AREA ECOLOGY. Witness tree data have been extracted from the Illinois Field Notes

of the original United States Government land surveys of the American Bottoms region. Attempts are being made to correlate geological, soils and climatic zones with the witness tree data in order to reconstruct the macro-floral assemblages of the bottoms region biotic community as they existed in the early nineteenth century. These will then be used as a "base-line" for reconstructing the biotic zones at the time of the aboriginal occupation of the Cahokia site. (10)

Grossman, Joel (University of California, Berkeley) THE BEGINNINGS OF METALLURGY IN THE SOUTH-CENTRAL HIGHLANDS OF PERU. Recent excavations in the Province of Andahuaylas (Dept. of Apurimac) have uncovered the earliest known ceramics for this area of the Andes, dating to ca. 1500 B.C. Associated with the ceramics at the site of Waywaka were gold foil and a metalworker's tool kit. Implications are that the use of metal was already well established in Peru by the initial period. (21)

Gumerman, George T. (Prescott College) THE UNREALIZED POTENTIAL OF REMOTE SENSING IN ARCHAEOLOGY. Archaeologists have long utilized aerial photography as a device for discovery and recording, but recent advances in the field of aerial remote sensing have provided new opportunities of which, for the most part, archaeologists are not aware. Multispectral films and viewing instrumentation provide the potential for the discovery of cultural features as well as for the construction of environmental maps necessary for modern archaeology. Tests with isodensitometers and microdensitometers indicate that these instruments might provide a means for the discovery and relative dating of irrigation systems and agricultural plots. The advantages and disadvantages of various types imagery and instruments for archaeological research will also be discussed. (2)

Gunn, Joel (University of Pittsburgh) MORPHOLOGICAL ANALYSIS SYSTEM (MAS)—A SOFTWARE PACKAGE ORIENTED TOWARD THE METRIC ANALYSIS OF ARTIFACT SHAPES. MAS is an integrated system of 20 Fortran IV programs intended primarily for analysis of artifact shapes recorded in various metric media. Discussion includes the philosophy of the system, recording of data, description, and use of the programs and selected examples of data and results. (7)

Gunnerson, James H. (Northern Illinois University) A POSSIBLE ORIGIN FOR SIMPLE STAMPING ON PLAINS POTTERY. Paddle-stamped Eskimo pottery exhibiting ridges and grooves, as well as bone paddles used to produce such a surface, have been recovered from Eskimo sites varying in time from ca. 300 B.C. to historic times. Some of these sherds bear a close superficial resemblance to the "simple stamped" pottery of the Mandan, Arikara, Pawnee, Wichita, and Plains Apache. In the United States, simple stamping thus far appears earliest on the middle Missouri River in late prehistoric sites of people who may have been ancestors of the Mandan. It is here suggested that Plains simple stamping represents diffusion from Eskimo. (8)

Haas, Jonathan (Arizona State Museum) ARIZONA HIGHWAY SALVAGE PROGRAM. The Arizona State Museum has been conducting an intensive archaeological salvage and survey program on Arizona's road systems since 1964. Under the program, financed by the Arizona Highway Department, the Museum surveys all proposed road construction to determine the number of sites that would be destroyed, and the impact their destruction would have on the total archaeology of the area. When the decision is made to dig a site, the director of the excavations uses his own research design to excavate. The same is true for the final analysis and report. (16)

Hagan, Timothy A. (Charles Bower's Museum), and Jonathon E. Ericson (University of California, Los Angeles) OBSIDIAN SOURCES IN CALIFORNIA PREHISTORY. The description of obsidian sources, utilized in California prehistory, is presented. A discussion is made of the ethnographic data of California with regard to the utilization of these sources and probably intertribal obsidian trade. (17)

Hall, Edwin S., Jr. (State University of New York, Brockport) A PRELIMINARY ANALYSIS OF HOUSE TYPES AT TUKUTO LAKE, NORTHERN ALASKA. Excavations at the large late prehistoric/early historic Eskimo site at Tukuto Lake, in the Etivluk/Colville drainage, disclosed dwellings of at least 6 different structural types. The form, method of construction, and artifact inventory of one example of each type is discussed and possible explanations for the variety are suggested. (11)

Hall, Robert L. (University of Illinois, Chicago Circle) CAHOKIA CHRONOLOGY AND PHASES. The problem of developing a site chronology for Cahokia is examined historically as a prelude to a summary of the results of the 1971 Cahokia Ceramic Conference at which a new phase terminology for Cahokia development was established. Sequences based upon stratigraphy and typological seriation are compared and related to radiocarbon chronology. Cahokia development opens with an occupation by a late Woodland people whose cultural record furnishes the basis for a Patrick phase (pre-A.D. 600 to 800). Following an unnamed phase of transition the emergence of a distinctively Mississippian pattern at Cahokia is recognized by the establishment of a Fairmount phase (A.D. 900-1050). The former Old Village and Trappist phases and their transition fall within the new Stirling (A.D. 1050-1150), Moorehead (A.D. 1150-1250), and Sand Prairie (A.D. 1250-1500) phases. After an unnamed and little known phase from A.D. 1500 to 1700 the Indian record at Cahokia concludes with a Historic phase characterized by eighteenth century burials. (10)

Hallinan, Patrick S. (see Clewlow, C. William, Jr.)

Hally, David J. (University of Georgia) THE DEVELOPMENT OF MISSISSIPPIAN CULTURE IN THE UPPER TENSAS BASIN OF LOUISIANA. Two seasons of site survey and test excavation in the Upper Tensas Basin of Louisiana have resulted in the delineation of a sequence of Plaquemine and Mississippian phases that spans the last 500 years of prehistory in the area. Plaquemine culture develops out of Coles Creek culture in the Upper Tensas Basin by A.D. 1200 and in the southern portion of the Basin continues into the historic period as historic Taensa and Natchez. Mississippian cultural features begin to appear as early as A.D. 700, and ultimately by A.D. 1550 a fully Mississippian manifestation, the Transylvania phase, can be recognized in the northern portion of the Basin. Mississippian manifestations in the Basin developed from local Coles Creek and Plaquemine antecedents and were not greatly influenced by Mississippian developments to the north. (15)

Hammond, Norman (Centre of Latin-American Studies) FUNCTIONAL ZONES AND DIFFERENTIAL TRAFFIC-FLOW IN A MAYA CEREMONIAL CENTER. The plan of the Maya ceremonial center of Lubantun is shown to have a concentric-zone structure of varying function, with differential central-accessibility between the zones. This suggests secluding residence, public religious areas and the ball-game being restricted to the elite. (14)

Hammond, Norman (see Cann, J. R.)

Handler, Jerome S. (see Lange, Frederick W.)

Harbottle, Garman (see Abascal-M., R.)

Harbottle, Garman (see Weigand, Phil C.)

Harp, Elmer, Jr. (Dartmouth College) AERIAL PHOTOGRAPHY AS AN AID TO ARCTIC ARCHAEOLOGY. This paper explains the advantages and disadvantages of aerial photography and photo interpretation with respect to field archaeology in Arctic environments. The discussion includes such topics as the reconnaissance and discovery mission, site evaluation, and expedition planning. The relative value of several air photo scales and various photographic emulsions will be weighted in terms of cost factors. (2)

Harper, Albert B. (University of Connecticut) OSTEODENSITOMETRIC ANALYSIS OF SKELETAL REMAINS. Bone mineral content and skeletal weight can be accurately assessed via osteodensitometric techniques. This involves scanning the bone with radio-active I-125, or Am-241. Estimates of bone mineral content are very highly correlated with skeletal weight. Procedures and estimation parameters of osteodensitometric analysis are discussed. The ulna and radius of 10 Russian seamen, killed in the Aleutian Islands in 1764, were scanned, and bone mineral content calculated. Comparative data on Sadlermiut Eskimo remains are discussed. (19)

Hassan, Fekri A. (Southern Methodist University) POPULATION DYNAMICS AND TERMINAL PLEISTOCENE ADAPTATIONS. A model to simulate the relationship between population size and carrying capacity is constructed. This model is based on the application of demographic and ecological methods. The effects of extractive efficiency, climatic changes, migration, and socio-cultural organization are considered. The model is designed to be of wide applicability. Few applications are suggested. (17)

Haynes, C. Vance (Southern Methodist University) GEOCHRONOLOGY AND PALEOENVIRONMENTS OF THE MURRAY SPRINGS CLOVIS SITE, ARIZONA. Interdisciplinary investigations over the past 6 years at the Murray Springs Clovis site have revealed a detailed stratigraphy which has yielded successive late Quaternary vertebrate and invertebrate faunas, Clovis hunting and camp sites, Cochise occupational horizons, fossil springs, prehistoric wells, and over 30 radiocarbon dates. These data, in conjunction with fossil pollen records from other sites, permit some interpretations of environmental change over the past 30,000 years in southeastern Arizona as well as the local environment at Clovis sites in the San Pedro Valley. (24)

Haynes, C. Vance (see Kelso, Gerald)

Hellmuth, Nicholas M. (Yaxha Project) A STREET SYSTEM AT CLASSIC MAYA YAXHA, GUATEMALA. Mappers discovered 6 paved streets at Yaxha. These streets are oriented north-south or east-west. There are rectangular compounds of low mound facing onto most of the streets. Although there is a Teotihuacan Tlaloc-like personage on Yaxha Stela 11, there is no proof that the streets and compact site layout of Yaxha represents local attempts to copy Teotihuacan concepts of city planning. Yaxha is probably not as unique as it now seems. If other lowland Maya sites were mapped, we might find street-like passageways and a more urban-like density of buildings at other large Classic Maya sites also. (14)

Hemmings, E. Thomas, Jr. (see Bullen, Ripley P.)

Henning, Dale R., and Elizabeth R. Henning (University of Nebraska) ARCHAEOLOGICAL FIELD TRAINING AT THE UNIVERSITY OF NEBRASKA. Field training in archaeology

at the University of Nebraska is designed around a fourfold approach involving (1) techniques of recovery and recording, (2) laboratory preparation and initial analysis, (3) lecture and reading, (4) comparison with other excavation programs. This multi-faceted approach has been tested and developed over 3 seasons; it offers a low-cost, quality educational experience coupled with adequate data recovery. (20)

Henning, Elizabeth R. (see Henning, Dale R.)

Herman, Suzanne (New World Archaeological Foundation) RECOVERING AN EARLY CLASSIC RITUAL OFFERING PATTERN IN THE CERAMICS FROM THE AGUA AZUL CENOTE, CHINKULTIC, CHIAPAS, MEXICO (abstract not received). (26)

Hester, James J. (University of Colorado) ENVIRONMENTAL RESOURCE UTILIZATION IN THE BELLA BELLA REGION, NORTHWEST COAST. The ecological and cultural significance of specific food species remains in coastal shell middens must be determined through reference to the modern distribution of these species. Inasmuch as the ecological remains differ in composition in a site from level to level, these findings are indicative of shifts in resource utilization. Data from the Bella Bella region of coastal British Columbia are presented with respect to the occurrence of major species by environmental zone. These data are then compared with the prehistoric data to indicate the nature of shifts in resource use through time. (8)

Hickey, Clifford G. (University of Alberta) VARIATION IN BASIC ECONOMIC STRUCTURE OF THE ARCTIC WOODLAND CULTURE. The Arctic Woodland Culture of the Kobuk River may be seen as a unique Eskimo socio-technic system. In a pioneering analysis, J. L. Giddings viewed the prehistoric and contemporary data from an ecological perspective, accounting for variation through the concept of adaptation. While supporting Giddings' thesis, new methods may allow us to go beyond material and behavioral statements regarding cultural dynamics. Adopting the structural approach of input-output economics, this paper discusses Arctic Woodland archaeological data as coefficients of economic transactions involving the variable allocation of resources and human energy. Such an approach leads to statements regarding relationships between major sectors of socio-economic systems, and provides insight into constancy and change in these relationships through time and across local ecosystemic boundaries. (11)

Hill, James N., Fred Plog, and Dwight Read (University of California, Los Angeles) EXPLAINING VARIABILITY IN SETTLEMENT DISTRIBUTIONS. Settlement pattern data from 2 nearby regions in Arizona, the Chevelon drainage and the Upper Little Colorado drainage, are discussed. Environmental differences between the regions are identified. The effects of environmental variables, such as plant community, soil, and the availability of water on the distribution of sites are considered. Alternative models explaining the distribution of settlements are presented and their importance to those who seek laws of behavior and cultural process identified. (4)

Hitchcock, Robert K. (see Lyons, Thomas R.)

Holmes, Charles E. (University of Alaska) ARCHAEOLOGICAL MATERIALS FROM THE UPPER KOYUKUK RIVER REGION ALASKA: THE PROBLEMS OF AFFINITIES AND DATING. This paper concerns material excavated during the past 2 field seasons in conjunction with the archaeological survey of the proposed trans-Alaska pipeline. Several assemblages exist. One characterized by notched points, another by "fluted" or basically thinned points, a third possibly representing proto-Denbigh or Denbigh-like artifacts, and a single assemblage thus far unique in Alaska. The latter consists of a blade and core technology including transverse burins, scrapers, and unifacially worked, steep-sided, plano-convex bipoints, associated with large bifaces. Excavations in Bonanza Creek Valley indicate that this region has been occupied by man for possibly 10,000 years, but there is no direct evidence that he has utilized the region within recent (contact) times. (6)

Holmes, Charles E., and E. James Dixon, Jr. (University of Alaska) EXCAVATIONS AT 49-RAT-32, AMCHITKA ISLAND, ALASKA. During the 1971 field season, the Department of Anthropology at the University of Alaska undertook salvage excavations of site 49-RAT-32. Excavations revealed 9 stratigraphic levels. A total of 5 semisubterranean houses were discovered; however, time permitted complete excavation of only one. The excavated house exhibits similarities to known contact period Aleut house types with some notable differences. Radiometric dating places this house at approximately 200 years B.P. (19)

Hondorb, Debi (University of Arizona) SOME PROBLEMS IN THE DATING OF METALLURGICAL SLAG. Previous attempts made to date the cinder slag which is produced during the smelting process have been fairly successful but the problem of dating tap slag remains relatively untouched. The need for such a method has arisen with the discovery of a fairly large smelting area. The question of contemporaneity which must be a part of any excavation dealing with multiple components may perhaps be best evaluated through the use of a technique which can accurately date an artifact that is associated with human activity. Currently, where enough uranium content is present in tap slag, fission-trace dating seems to be the most accurate means available. While this method has been used to date samples of glass, to the best of the author's knowledge it has not been used to date slag. (17)

Hurley, William M. (University of Toronto) **EFFIGY MOUND MATERIAL CULTURE**. The Effigy Mound Tradition originated out of an indigenous Middle Woodland base in the present tri-state area of Illinois, Iowa, and Wisconsin. Recognizable material culture items make their appearance at ca. A.D. 300 and continue until ca. A.D. 1642. Excavations at 2 sites in central Wisconsin yielded large quantities of diagnostic items dating from A.D. 600 to A.D. 1300. A typological ordering of the associate ceramics will be compared to a computer derived cluster and principal component analyses and then presented in histogram, matrix correlations, and dendrogram form. (9)

Irwin-Williams, Cynthia (Eastern New Mexico University) **THE SEASONAL STRATEGY**. This is a shortened version of a paper prepared for the School of American Research Advanced Seminar on Seasonality in Prehistory (Santa Fe, December, 1971). In this Seminar, evidence of prehistoric seasonal economics and cycles was examined in order to provide a basis for the generation of hypotheses concerning the derivation and systemic implications of seasonality, which can be tested by archaeological data. In the formulation of such models it is essential to explore various sources, not only within anthropology, but also from other conceptual structures such as General Systems Theory and Game Theory. Here a model is derived from Game Theory to provide explanations for the development of and socio-economic consequences of markedly seasonal cycles. Optimizing and satisfying strategies are considered in these terms, and in their relations to the evolution of sedentary societies from hunting-gathering bases. (4)

Ibell, William H. (State University of New York, Binghamton) **QUECHUA SPEAKERS AND THE CULTIVATION OF STEEP HILLSIDES**. The ecology of the cultivation of steep hillsides and terraces suggests the Andean Montana or the far North Highlands as a probable center of development. Coarse brown ceramics of a related tradition associated with hilltop sites remain little studied but there is convincing evidence for dating these materials as at least pre-Middle Horizon. The frequently made assumption that these complexes relate to an expansion by the Incas, or a proto-Inca development, is probably incorrect. The error may relate to the large number of shared vessel shapes between these coarse brown wares, and Imperial Inca ceramics. However, an alternative proposal would be to interpret the coarse brown tradition as an early expansion of Quechua speakers of which the Inca conquests are but a late manifestation. (12)

Jelinek, Arthur J. (University of Arizona) **FUNDAMENTAL PROBLEMS IN THE DESCRIPTION OF LITHIC INDUSTRIES EXEMPLIFIED BY THE ET TABUN PALEOLITHIC COLLECTIONS**. It is clear from the increasing quantity of literature relating to the description of the full range of lithic materials from archaeological sites that even such basic metric attributes as the length, width, and thickness of flakes are now determined by a variety of techniques. The results of these different techniques are usually not comparable. The range of present techniques for recording these and other observations are summarized and a system based on technologically significant formal properties is proposed. (23)

Jelks, Edward B. (Illinois State University) **OBSERVATIONS ON THE CONCEPT(S) OF ASSOCIATION IN ARCHAEOLOGY**. The term "association" is frequently used by archaeologists in a special way to connote a historical/cultural relationship between 2 or more things. The associated things may be either individual objects or classes of objects. "Associations" between 2 or more discrete physical objects sometimes may be observed with absolute objectivity; i.e., the "association" is a visually verified, spatial/contextual relationship between the respective objects which can be observed by anyone who wishes to look. But "associations" between classes of objects (e.g., pottery or projectile point types), or between classes of objects and specific cultures, are something quite different; these are really correlations between abstracted classes which the archaeologist formulates in his mind through logical processes rather than perceiving them visually. Or, stated another way, one kind of "association" is observed directly in the archaeological record, the other is inferred through correlations of abstracted classes. Clearly, the different concepts that underlie the term "association" constitute the very foundation of a substantial proportion of archaeological inference; yet archaeologists have consistently used the term without defining it or making explicit the true significance of a particular usage. This has sometimes led to invalid inferences. (4)

Joesink-Mandeville, L. R. V. (California State College, Fullerton) **CONCERNING OLMEC-MAYA RELATIONSHIPS: A CORRELATION OF LINGUISTICAL EVIDENCE WITH ARCHAEOLOGICAL CERAMICS**. An attempt is made to relate glottochronological evidence bearing on the divergency of certain Mayan languages with early Formative ceramic complexes in the Huasteca, the Olmec Gulf Coast region, Yucatan, the Peten, the Soconusco region of Guatemala, and the Guatemalan highlands. Scrutiny of this data, including available radiocarbon determinations, has led to the conclusion that the "heartland" of the ancestral Mayan group, wherein they first achieved a sustenance economy sufficiently adequate to support sedentary village life, was most probably within the Olmec Gulf Coast region. The Olmec are therefore viewed as being an early Mayan-speaking people, and their civilization the antecedent of the Maya Classic. (13)

Johnson, Donald Lee (University of Illinois) **ON THE ORIGIN AND EXTINCTION OF PYGMY ELEPHANTS, NORTHERN CHANNEL ISLANDS, CALIFORNIA**. Pygmy elephant bones occur in abundance on the islands off Santa Barbara, California. Many have thought that a severed peninsula created the islands and stranded a population of normal-

sized mammoths which, because of limited forage, became reduced in size during late Pleistocene time. However, modern elephants are excellent distance swimmers, hence there is no reason to believe that the predecessors of the pygmy elephants were not. Thus a land bridge is not a sine qua non for explaining elephants on the Northern Channel Islands. Also, other studies show that, in the absence of predators, certain large animals (horses, deer, and others) may attain pygmy size over short periods of time, in some cases less than 15,000 years. This same evidence suggests that elephants, in the absence of predators, may also become small in comparable periods of time. Extinction of the pygmy proboscideans likely reflects one or both of 2 environmental stress factors which appeared in very late Quaternary time, predators (man), and periods of prolonged drought. (24)

Johnson, Lewis L. (Polytechnic Institute of Brooklyn) **FLINT KNAPPING, COMPUTERS, AND LITHIC TECHNOLOGY**. Increasing interest among archaeologists in lithic technology, as opposed to typology, seems to be due to 2 developments. The first arises from an appreciation of the utility of computers in analyzing the attributes of lithic implements. Computers allow implements which do not have obvious stylistic differences to be defined by large numbers of small variations. The second development is an increase in the number of archaeologists, many trained by Don Crabtree, who are flint knappers. Archaeologists have theorized about the nature of lithic technology, for example, about the difference between purposeful retouch and use retouch, but few have studied the physical properties of stone which influence the artifact form. The advantage of knowing how to chip stones lies in duplicating ancient implements. This leads to a better understanding of the causes of stone tool attributes. An example of the value of these approaches, especially when combined, is seen in the analysis of material from quarry and camp sites in Northern Chile belonging to the Aguas Verdes complex. (23)

Judge, W. James (University of New Mexico) **THE CHACO CANYON SURVEY: 1971**. During the summer of 1971, an archaeological survey of Chaco Canyon National Monument and its immediate environs was undertaken, emphasizing the ecological and environmental aspects of the site locations. A transect method of sampling was employed in order to maximize reliability of ecological data. An approximate 15% sample of the survey area yielded information on 282 sites representing a time period from Paleo-Indian to the present. SPSS computer programs were employed in the analysis and the major, inductively-derived results of the survey are discussed in this paper. In addition, the possibilities of testing deductively-derived statements regarding a specific demographic model are explored. (18)

Judge, W. James (University of New Mexico) **THE FIELD SCHOOL: A TRAINING SESSION OR LEGITIMATE RESEARCH?** It is generally acknowledged that an archaeological field school is much more than a training session. In that the destruction of a site is taking place, the field school must be viewed primarily as a legitimate research project. Yet it is also one of the few means by which those who aspire to become professional archaeologists can attain initial proficiency. Thus the field school is secondarily, but no less importantly, a classroom exercise in which the penalty for substandard performance can well be the loss of invaluable data. This, then, is the source of a fundamental problem inherent in the field school situation; do the mistakes made by students untrained in the excavation and initial analysis of archaeological data prevent the attainment of legitimate research objectives? This paper examines some of the alternatives and concludes with cautious optimism that training and research objectives can be made compatible, assuming (1) strict adherence to a grading (penalty) system, (2) utilization of modern data storage and retrieval techniques, and (3) a concerned effort on the part of the field school staff to make the experience continually meaningful to the students. (20)

Kano, Chiaki (University of Tokyo) **THE PROBLEMS OF CHAVIN AND PRE-CHAVIN**. Recently, from the Shillacoto site, new important materials have been recovered, such as ceramic figurines of cats, bone implements with feline designs, and pottery shards of the Tropical forest. All of them belong to the pre-Chavin period. As to the designs on bone implements, one can point out a similarity with ones depicted in the stone carvings found at Chavin de Huanar. On the other hand, sherds of quite alien type to this region should indicate the existence of cultural contact between the Selva and the Andes. (12)

Keel, Bennie C., and Jefferson Chapman (University of North Carolina) **THE CONNESTEE PHASE IN SOUTHEASTERN PREHISTORY**. The recognition of the Connetee phase (ca. A.D. 300-1000) in the Appalachian Summit area has led to a reassessment of cultural relationships between the northern portion of the Southeast and the Midwest during the "Middle Woodland" period. Specifically, the Connetee phase is interpreted as being contemporary with the Forsyth-Cartersville foci of northern Georgia, the Candy Creek-Hamilton foci of eastern Tennessee, and with Middle and Late Hopewell in the Scioto Valley. Specific attribute sets common to these manifestations are discussed and the evidence of trade between these units and Ohio Hopewell is reviewed. Site distribution suggests a diffuse type of subsistence economy. (15)

Kelley, Ellen Abbott (Southern Illinois University) **EXCAVATIONS AT THE CHALCHIHUITES CEREMONIAL CENTER OF ALTA VISTA, ZACATECAS, MEXICO**. The University Museum of Southern Illinois University, Carbondale, carried out excavations at the ceremonial center site of Alta Vista, Chalchihuites, Zacatecas, during the fall months of 1971, under the direction of J. Charles Kelley and Ellen Kelley, aided by Betty Bell,

Contrary to expectations, the earliest part of the center proved to belong to the Canutillo phase, although the later occupation proved to be Alta Vista phase as anticipated. The canutillo constructions, including the Hall of Columns, were remodeled in Alta Vista times, ca. A.D. 300-500, and a series of rooms made of adobe brick walls were constructed on the older platforms. Elsewhere in the site other deep adobe rooms, with stone masonry columns supporting room wall junctions, were found in groups. One status burial was found beneath the Hall of Columns, with stacked bones of sacrificial victims and 5 paint cloisonne cups, a Suchil jar, and a broken flute. Cremated burials were found; also paint cloisonne decorated gourd vessels. Extensive evidence of ceremonial cannibalism appeared. (26)

Kelley, J. Charles (Southern Illinois University, Carbondale) VOLADORES AND ARCHAEOLOGICAL VILLAGE MODELS IN WESTERN MESOAMERICA. The well known Voladores performance of the Totonacs was practiced also in western Mexico at the time of Spanish contacts. At that time, the "dance" was not just an exhibition of skill but in actuality represented a solar ceremonial in which each of the 4 dancers made 13 revolutions of the pole, thus completing the 52-year cycle. It is probable that the contact period voladores ceremonial has deep roots in Mesoamerican ceremonialism and that it is represented in a formative stage in the west Mexican village models, associated with the shaft tomb complex, that show a "tree of heaven" arising from the center of the village court. Development of this hypothesis has considerable potential in expanding our knowledge of both ceremonialism and astronomical observation and recording in western Mesoamerica. (13)

Kelly, A. R. (University of Georgia) FROM EARTH LODGES TO WATTLE AND DAUB STRUCTURES IN GEORGIA. The 1971 exploration at the Bell Field mound site, Carter's Dam, Georgia, represented the sixth season of investigation with 9 successive mound occupations partially exposed. The 1971 season concentrated on 3 basal mound occupations with 3 superimposed earth lodge assemblages. The upper mound structures, 5 truncated in modern cultivation, give a Dallas continuum closely related to the culture described at Hiwassee Island, culminating in a mixture of Dallas and a north Georgia variant of Lamar. Unbroken continuity in successive mound building and an architectural progression from earth lodges to early wattle and daub is reconstructed. Cultural diagnostics, primarily pottery, suggest a pre-Dallas earth lodge manifestation most nearly resembling north Georgia Savannah with some nearby Tennessee provenance. Carbon-14 dates give a time span of successive cultural development in situ, from twelfth to sixteenth centuries A.D. (9)

Kelly, Roger E. (San Fernando Valley State College) ON PERSISTENCE IN SOUTHERN CALIFORNIA PREHISTORY. Persistence of lifeways in prehistoric southern California from ca. 5000 B.C. to historic times is often described in terms of slowly-changing, conservative, and diversified adaptations. Hunter-gatherer groups in rich natural environments left archaeological records indicating some change and developments in material culture elaboration but relatively stable adaptive methods. A systems theory view of persistence in adaptation will be presented as an explanatory framework. (8)

Kelso, Gerald (University of Arizona) POLLEN ANALYSIS OF 2 ALLUVIAL PROFILES FROM GRASSHOPPER RUIN. Pollen analysis of 2 profiles from the vicinity of Grasshopper Ruin revealed alternating frequencies of disturbance plant and arboreal pollen types. These pollen spectra resemble those of other sites which have been attributed to varying intensity of human activity. The appearance of similar pollen curves in profiles from archaeological sites upon which the Colorado Plateau environmental sequences were based suggests that the pollen from the floors of those sites, and consequently the sequences themselves, may be seriously biased by cultural factors. (1)

Kelso, Gerald (University of Arizona), Larry D. Agenbroad (Chadron State College), and C. Vance Haynes (Southern Methodist University) CLOVIS HUNTING CAMP AT MURRAY SPRINGS, ARIZONA: AN ANALYSIS AFTER 2 FIELD SEASONS. The 1970 field season at the Murray Springs Clovis site revealed camp activity in surface and near surface conditions to the south of the hunting areas. Tools and waste flakes in primary concentrations indicated camp activity in association with the kill sites. With the 1971 season, a statistical sampling technique was employed, resulting in delineation of 2 additional areas of lithic concentration and their relationship to the paleotopography. (24)

King, Denise E. (Michigan State University) SAMPLING AND INTERSITE VARIABILITY. With the rise of settlement archaeology and regional research problems has come the concomitant need for concern with sampling procedures at that level. So far, discussion in the literature has been concerned with sampling problems dealing with intrasite variability, but little or no attention has been given to the problem of intersite variability. This paper will discuss actual regional study programs described in the literature, and will evaluate them in 2 ways: (1) in terms of the inherent strengths and weaknesses as sampling designs, and (2) as to their relevancy for different research design purposes. (17)

King, Tom (University of California, Riverside) A "COOPERATIVE" MODEL FOR SALVAGE ARCHAEOLOGY. It is widely recognized that salvage archaeology today suffers from relatively poor coordination with emerging explanatory research generated by the academic profession. It is equally clear, however, that if there were a way to simply turn the administration of salvage over to academic institutions the problems of faculty and graduate

student instability and inter- and intra-institutional chauvinism would constitute major barriers to the organization of effective research. A possible third course is proposed here: the explicit and formal organization of regional "cooperatives" integrating diverse groups of institutions, organizations, and agencies. To attain maximum efficiency through such a program will require replacement of hierarchical with systemic models of archaeological organization. (16)

Klein, Joel I. (New York University) CHERT AND FLINT: THERMAL ALTERATION AND IDENTIFICATION. The results of recent experiments involving thermal alteration in approximately 20 varieties of chert and flint from the eastern United States will be discussed. The various property changes resulting from thermal alteration, emphasizing those in color, will be considered along with how they can be of value to the archaeologist. (17)

Klinger, Timothy C. (see Strachan, Richard A.)

Knudson, Ruthann (Washington State University) PARALLEL-COLLATERAL FLAKING IN THE PLAINS: PLAINVIEW AND MACHAFFIE. The Plainview and Bonfire Shelter sites, Texas, and the MacHaffie site, Montana, appear to represent geographical and temporal extremities of a tradition of parallel-collateral flaking on the Plains. Reassessment of these collections has provided models of lithic production systems utilized at each site, and comparison of systemic relationships between sites provides basis for evaluation of the inferred continuity of a lithic style over time and space. Plainview and Bonfire Shelter are small kill and butchering stations in the Southern Plains, dated at about 10,000 years ago. Neither site yielded large assemblages nor quantities of debitage, but evidence of manufacturing stages is retained on the points and scrapers that are available. MacHaffie, in contrast, is an 8000-year-old Northern Plains workshop and camp close to a large chalcedony outcrop quarry, with a small inventory of finished tools but considerable amounts of debitage. While there are numerous differences between these assemblages, parallel-collateral stylistic treatment of projectile points is common to all. Correlation of lithic styles with production sequences is necessary to substantiate inferences of strong archeological continuity as a cultural tradition. (23)

Kolb, Charles C. (Bryn Mawr College) LOWLAND MAYAN AND OAXACAN INFLUENCE AT TEOTIHUACAN, MEXICO. Linne (1942) and Millon (1964) have reported Tzakol Mayan sherds near the Tlamimilolpa room complex toward the eastern edge of urban Teotihuacan, Mexico. Millon (1966, 1967) has delineated a barrio, based on quantities of Mayan and Veracruz ceramics, and believes the area to be inhabited by Mayans or by local merchants specializing in bringing these wares to Teotihuacan. On the western side of the city, Millon and Paddock have defined a zone occupied by people who came from the Valley of Oaxaca. Additional data on this "foreign" influence is presented from several rural Teotihuacan sites investigated by Sanders and others (Teotihuacan Valley Project). Possible relationships with Barton Ramie, Tikal, and Monte Alban will be noted. (26)

Kolb, Charles C. (see Bilharz, Joy)

Kus, James J. (Fresno State College) THE CHICAMA-MOCHE CANAL IN CHIMU PREHISTORY. The Chicama-Moche Canal is a Chimu period inter-valley canal in northern coastal Peru. Some 30 cross-sections were recently excavated along the route of the canal, and these brought to light abundant material regarding the method of construction, the use, and the abandonment of the inter-valley canal system. In particular, analysis of data was very successful in determining the age of the canal. Possible implications of the canal's construction and use are summarized relative to Chimu prehistory in general. (25)

Kuttruff, Carl (see Blanton, Richard E.)

Lange, Frederick W. (Beloit College), and Jerome S. Handler (Southern Illinois University) AN ARCHAEOLOGICAL INVESTIGATION OF THE DOMESTIC LIFE OF PLANTATION SLAVES IN BARBADOS, WEST INDIES. The research reported is part of a long-range study of the social and cultural life of the Barbados slave population over the period 1640-1834. Written source materials have yielded considerable information on the institutional aspects of slave society, but considerably less on social or cultural topics, particularly those aspects relating to the domestic life of slaves. To increase our knowledge of the latter area, archaeological excavations were conducted in plantation slave villages during the spring of 1972. Preliminary results of the project are presented and deal with settlement pattern and material culture remains. (8)

Lathrap, Donald W. (University of Illinois) CULTURAL CONTACT AND CULTURE AREAS IN EARLY NORTHERN SOUTH AMERICA. Most attempts to synthesize the culture of South America operate in terms of culture areas which, at best, show some relationship to the situation as of A.D. 1540. Available archaeological evidence, scattered and insufficient though it is, suggests that between 3000 B.C. and 1000 B.C. very different cultural boundaries and centers of cultural prestige and influence were operative. An attempt is made to sketch the vague outlines of such areas of intercommunication. (12)

Lechtman, Heather (Massachusetts Institute of Technology) SOME FURTHER STUDIES OF CHIMU GILDING. Analysis of gilded objects from Lambayeque presented at the 34th

International Congress of Americanists in 1970 showed that a specific type of gilding was characteristic of the northern manifestations of the Chimu culture. Further work on objects excavated at Huanchaco have confirmed that this type of gilding was indeed typical of the Chimu and has extended the known distribution of this technique considerably to the south. (21)

Linares, Olga F. (University of Pennsylvania Museum) **BARRILES, A MIDDLE FORMATIVE CHIEFDOM CENTER AND ITS ROLE IN THE SOCIO-POLITICAL DEVELOPMENTS OF WESTERN PANAMA.** A discussion of settlement and subsistence among satellite villages of the Barriles Culture (ca. 750 B.C.) in the Volcan Baru area of the Chiriquí Highlands. (26)

Lipe, William D. (State University of New York, Binghamton) **NEW MODELS FOR SALVAGE ARCHAEOLOGY.** (1) A widening gap between salvage and other archaeology has appeared in the areas of problem orientations and approaches. This may be due in part to retention by salvage contractors of archaeological research models current when the contractor entered the salvage field. (2) Large regionally-oriented salvage projects have consistently been more productive than have small, short-term, spatially restricted projects. (3) Because archaeological sites are a non-renewable and widely-threatened resource, archaeologists need to replace the salvage model with a resource conservation one. (16)

Lischka, Joseph J. (University of Arizona) **CAN ONE GET MORE OUT OF A POT THAN WAS PUT INTO IT?** Analysis of the spatial distribution of ceramic vessels within an archaeological site provides a means of discovering how various kinds of vessels were used and the contexts within which they were used. The utility of the several multivariate programs of the BC TRY system for this sort of analysis is discussed, using ceramic data from the Highland Maya site of Kaminaljuyu and from the southwestern U.S. (4)

Lister, Robert H. (University of New Mexico) **CHACO CANYON STUDIES BY THE NEW MEXICO ARCHAEOLOGICAL CENTER** The New Mexico Archeological Center has as its long range goal a multidisciplinary study of environment and man in the Chaco Canyon area of northwestern New Mexico. Activities underway or proposed include assembling archival data on archaeological collections from the Chaco, environmental investigations including geographical, geological, and biological studies, ethnographic programs, and archaeological surveys, test digs, and large scale excavations. A remote sensing laboratory has been established. (18)

Longacre, W. A. (University of Arizona) **MULTI-DISCIPLINARY RESEARCH AT THE GRASSHOPPER RUIN, ARIZONA.** The University of Arizona has now completed 9 years of research in a long range program of archaeological investigations at the Grasshopper Ruin, a large, fourteenth century pueblo community in east-central Arizona. This research is designed to investigate (1) the selective pressures responsible for the sudden aggregation of population into large pueblo communities during the late thirteenth century in this area, (2) the adjustments made by the community during the 100 years of its existence, and (3) the abandonment of the region by A.D. 1400. We suspect that a slight environmental shift necessitated the readaptation of the indigenous population. To test this hypothesis and to investigate the cultural adjustments attempted by these people, we have involved numerous specialists from a broad range of disciplines outside of anthropology. This symposium presents the results of the work to date, evaluates the research design and the strategy we have adopted, and details the future plans for research given what we have accomplished to date. Innovations in data collection and analysis are emphasized and sampling problems and our solutions are discussed. (1)

Lyons, Thomas R., and Robert K. Hitchcock (University of New Mexico) **REMOTE SENSING INTERPRETATION OF AN ANASAZI LAND ROUTE SYSTEM.** Application of remote sensing investigative techniques to a specific problem in a semi-arid environment is presented. The Chaco Canyon area in New Mexico is one which has been subjected to archaeological examination over a period of at least 75 years. A few prehistoric road segments were known; however, the full extent and significance of an integrated land route system was not recognized until the interpretations of black-and-white aerial photos were made. This analysis led to the recognition and mapping of a network of prehistoric roads which are only dimly discernible or completely unrecognizable from a ground station vantage point. Evidence, both historical and archaeological, is presented in order to substantiate our conclusion. It is also noted that this land route system may have served as an integrative mechanism for a more complex socio-political organization than has commonly been suggested for the Chaco region. (2)

Macfadyen, A., and D. W. Clark (National Museum of Canada) **KOYUKUK ATHABASKAN-KOBUK ESKIMO CULTURAL RELATIONSHIPS.** A prehistoric sequence for the Koyukuk drainage is partially definable at the present. The youngest complex is early historic Koyukuk Athabaskan. The oldest is fluted point Paleo-Indian. Our first consideration vis-a-vis inland Eskimos is a Norton or Ipuitak-related assemblage from 5 house pits on the middle Koyukuk representing either Eskimo or Indian occupation possibly dating to A.D. 0. No archaeological complexes are definitely assigned to the intervening period prior to protohistoric contact, however, a speculative later prehistory is offered using Koyukuk collections which may belong to that period set within the limiting framework of data from adjacent

regions. A long history of contact between the Kobuk Eskimos and Koyukuk Athabaskans is postulated on the basis of archaeological and ethnographic evidence. This contact may have developed initially through inter-tribal trade, for instance for obsidian from the Barza Tena source on the Koyukuk. Through time trade relationships, including intermarriage and extension of kinship, trading and hunting partnerships, feasting, shamanistic interchange, and other relations such as those attendant to internecine raiding developed. (11)

Malone, Patrick M., and John L. Cotter (University of Pennsylvania) **FIELD TRAINING: HISTORICAL SITES ARCHAEOLOGY.** The Department of American Civilization at the University of Pennsylvania has conducted a summer field school in historical sites archaeology for the past 6 years. The purpose of the field school is to give students experience in the excavation and cultural analysis of historical sites in America. The program is presently being expanded to include a preliminary course on archival research and documentation of a specific local site, which will then be excavated during the summer field school. Detailed study of recovered artifacts will be begun during the summer excavation period and continued during a fall course on archaeological laboratory techniques. In the past, we have found it difficult to combine documentary research, excavation, artifactual analysis, and preparation of a complete site report within the time limits of a single summer course. The expanded program should solve this problem. We ask our students to make a thorough cultural study of an historical site using artifacts and other physical evidence recovered by systematic excavation and documentary materials collected by historical research. (20)

Mandeville, M. D. (see Flenniken, J. J.)

Marcos, Jorge **CURRENT EXCAVATIONS AT AN EARLY VALDIVIA SITE, IN CHANDUY VALLEY, COASTAL PERU** (abstract not received). (25)

Markotic, Vladimir (University of Calgary) **LATE NEOLITHIC IN SOUTHEAST EUROPE.** The present writer has done research on the late Neolithic and particularly on the Vinca culture of the Southeast Europe. He has visited, during his sabbatical year (1970-71), all major museums and sites in that region. The research confirmed that the Vinca culture started in the north and moved southward into Greece. Thus, it did not originate in Anatolia as most southeast Europeanists still think. Stylistic changes were also examined and correlated to the various phases of the culture. (8)

Marmelstein, Al (Earth Satellite Corporation) **AERIAL REMOTE SENSING IN MARINE ARCHAEOLOGY.** Although several surface borne remote sensing systems are currently employed in marine archaeology surveys, extension of these activities to aircraft platforms does not seem indicated. Rather, the utility of aircraft for conveying imaging systems offered an unexploited extension of such activities. The results to be presented assess use of a photographic system employing several film/filter combinations for both detection and precise positioning of submerged sites. The rationale for choice of critical photographic and flight parameters will be discussed. The potential exhibited by other commercially available and prototype systems will also be presented. (2)

Marquardt, William H. (Washington University) **RECENT INVESTIGATIONS IN WESTERN KENTUCKY SHELL MOUNDS.** A 10-day archaeological investigation of two shell mound sites in western Kentucky has been carried out in an effort to add to the overall picture of subsistence activities of the (presumably) Archaic Horizon occupants of the important Green River shell mound sites. A preliminary report of the findings from test excavations at these sites (Bt 5 and Oh 13) will be given. (9)

Marshack, Alexander (Harvard University) **MICROSCOPIC STUDY OF UPPER PALEOLITHIC ENGRAVED MATERIALS.** Microscopic analyses of the engraved Upper Paleolithic symbolic artifacts allows a determination of artifact wear and usage, the sequence of symbolic engraving, changes in the engraving tools, and therefore allows determination of certain limited but specific cognitive contents. (7)

Martin, Paul S. (University of Arizona) **THE DISCOVERY OF AMERICA.** By analogy with other successful animal aliens, the spread of Homo sapiens over the New World can be modeled as a front of dense population (one person per  $\text{mi}^2$  or 0.4 per  $\text{km}^2$ ) sweeping the continent. The advance was fed by overkill of the innocent, easily hunted Rancholabrean megafauna. Values proposed for the model include an average frontal depth of 160 km, an average rate of frontal advance of 16 km annually, an average human population density behind it of 0.04 persons per  $\text{km}^2$  and a maximum population growth rate (after Birdsell) of 3.4% annually. The model generates a population sufficiently large to overkill a biomass of Pleistocene large animals estimated at 9 tons per  $\text{km}^2$  (50 animal units per section) or  $2.7 \times 10^8$  metric tons for the Americas south of Canada. Extinction on the front would require that one person in 4 destroy one horse-sized animal, or an equivalent weight of other species, per week. Since local extinction of the megafauna occurred in any single region in 10 years or less, the discovery of any kill sites or other direct archaeological evidence must be regarded as extremely fortunate. The large number of North American extinctions (32 mammalian genera and perhaps 100 species at the end of the late-glacial) and the very sparse record of extinct animals directly associated with artifacts of the early hunters is not a paradox but a necessary condition of this overkill model. The radiocarbon chronology of megafaunal extinction places New World invasion at between 11,000 and 12,000 years ago. If Early Man discovered America before 12,000 B.P., he came without Early Woman. (24)

Matheny, Ray T. (Brigham Young University) ARCHAEOLOGICAL INVESTIGATION OF THE ANCIENT CANAL SYSTEM AT EDZNA, CAMPECHE, MEXICO. An ancient canal system which connects the Maya site of Edzna, Campeche, with the Rio Champoton, some 32 km distant, is being investigated. The canal system also forms a moat around a sizable quadrangle of diked and possibly defensive structures located 1 1/2 km south of the central Edzna ceremonial center. A suite of hypotheses is to be examined concerning the possible primary and secondary functions of the canal system. These are (1) defense, (2) additional protein source, (3) water transportation of people and trade goods, and (4) water supply for various purposes. A fifth possibility is that the canal served to drain low-lying areas. (26)

Mathews, Thomas W., and Jerry L. Greene (University of Arizona) THE MAMMALIAN FAUNA OF GRASSHOPPER RUIN, NAVAJO COUNTY, ARIZONA. Studies initiated in 1969 on the faunal collections from 9 seasons of excavation at Grasshopper Ruin, have yielded identifications for 9000 mammal specimens in 40 taxa. Age-class composition, sex ratios, and other quantitative relationships are discussed. The sample indicates 11 species supply 97% of the specimens and mule deer is the most important source of meat. All species identified are those expected in the area today except, possibly, whitetail deer. Skinning and butchering marks indicate extensive utilization of dog and Abert's squirrel. Mule deer and cottontail alternate through time in mode of occurrence and this is clearly seen in the stratigraphy of the Corridor location in the site. (1)

Mayer-Oakes, William J. (Texas Tech University) RECENT EXCAVATIONS AT SAN JOSE, ECUADOR. Excavations conducted in 1971 at the San Jose site in highland Ecuador have confirmed the surface collection interpretation that the site is an important early unit. A unifacial industry in obsidian is characterized by blades, burlins, and scrapers with no projectile points either unifacial or bifacial. The site is similar to El Inga in being shallow, featureless, with no bone preserved or charcoal for dating. Typologically and by obsidian hydration dating, the site is the earliest yet known from the central highlands of Ecuador. (25)

McArdle, John (State University of New York, Plattsburgh) AN APPLICATION OF COMPUTERS TO THE QUANTIFICATION AND ANALYSIS OF ZOOARCHAEOLOGICAL DATA. A commonly encountered problem in faunal analysis from archaeological sites is the need to handle large quantities of attribute data in a comprehensive manner with a minimal expenditure of time. As a result of fieldwork on several sites in southeastern Turkey, a scheme for numerically coding morphological attribute data was devised. Along with this numeric code, several types of standardized recording forms were made and tested. These data were placed on punch cards and the quantification and analysis was completed with the aid of a computer program that generated multidimensional cross-classification tables and a number of useful statistics. The present paper describes in detail the application of this technique to a specific site from the work in the field to the interpretation of the computer printout. Additional applications of the technique and possible limitations are discussed. (17)

McBride, Harold (Topanga, California) MIDDLE AND LATE PRECLASSIC CERAMICS FROM CUATITLAN, VALLEY OF MEXICO (abstract not received). (26)

McCartney, A. P. (University of Arkansas) PREHISTORIC CULTURAL INTEGRATION ALONG THE ALASKA PENINSULA. An archaeological reconnaissance within the Izembek National Wildlife Refuge near Cold Bay in 1971 provides a valuable comparative phase for understanding Peninsular Eskimo prehistory. The sites investigated are approximately equidistant between Port Moller, the only other western Peninsula locality excavated, and Akun-Akutan, the easternmost Aleutian Islands where excavations have been conducted. The Izembek Phase, dated to A.D. 1050, appears to share greater cultural continuity with Naknek-Katmai phases of a comparable period than with known eastern Aleutian assemblages. The occupants of the Peninsula from at least A.D. 1000 until the eighteenth century Russian contact are hypothesized to be Peninsular Eskimos rather than Aleuts. The nature of the Aleut-Eskimo boundary is discussed. A large whale bone house ruin is described and ecological implications discussed. (19)

McCormick, Olin F., III (see Anderson, Keith M.)

McDougle, Eugene (Columbia University) CLIMATE CHANGE AND POPULATION SHIFTS ALONG THE SOUTHWESTERN ECUADORIAN COAST. The Fairbridge eustacy curve provides the basis for a model to infer climatic shifts during the past 5000 years. The model is applied to a particular micro-climatic zone and the evidence of climate change in that region is examined. In the Santa Elena Peninsula of southwestern Ecuador there appears to be a correlation between fluctuations in precipitation and the utilization of the area by its human population. Historical and archaeological evidence seem to support the conclusion that during periods of increased rainfall the region was occupied, whereas during periods of reduced rainfall the population decreased or the region was abandoned. Variants of this pattern can be explained as the result of technological innovations. (25)

McDowell, Ellis Ebaugh (American University) A TECHNO-ECOLOGICAL MODEL FOR ANALYSIS OF ARCHAEOLOGICAL MATERIALS IN THE POTOMAC PIEDMONT. This paper presents a model of seasonal and periodical procurement patterns for the Archaic

stage of cultural development in the Potomac Piedmont. The model is techno-ecological in focus and includes a series of interrelated limited activity camps and their related multiple activity home bases. Procedures for testing the validity of the model are discussed, as are difficulties such as lack of floral and faunal remains, encountered in the application of this model to artifactual materials from 9 test excavated and 6 surface collected sites in the Potomac Piedmont. (9)

McGimsey, Charles R., III (Arkansas Archeological Survey) REGIONAL OVERVIEWS AND ARCHAEOLOGICAL PRIORITIES. Effective, efficient advancement of archaeological knowledge requires the development of regional overviews and establishment of area-wide priorities concerned with (a) filling gaps in our areal or temporal knowledge and (b) investigation of processual problems. This, in turn, requires greater communication and coordination than presently is operative within the archaeological community. The various problems and potentialities of particular approaches to resolving this need are presented, including relying on the present annual and regional meetings, coordination through the National Park Service archaeological centers, and the establishment of some new mechanisms for this. Also considered will be some of the techniques which it will be necessary to employ to implement this effectively by whatever route, including periodic updating of regional assessment, involvement of lay archaeologists in producing data, and education of the general public toward the importance of protecting and preserving data. (16)

McHugh, William P. (University of Wisconsin, Milwaukee) STUDENT TRAINING IN EUROPEAN PREHISTORY—1971. In the summer of 1971, 8 students under my general supervision spent 3 weeks in France and 4 weeks in West Germany and Switzerland working with European prehistorians from Les Eyzies, Tubingen, and Bern on Upper Paleolithic and Epipaleolithic caves and open-air sites. The organization and activities of this program are related and the problems and benefits are discussed. (20)

McKenna, Robert A. (Dartmouth College), and John P. Cook (University of Alaska) THE DIXTHADA SITE, CENTRAL ALASKA. In 1936 and 1937, Froelich Rainey excavated part of this site, finding that it spanned the late prehistoric-historic transition of the Athapaskans in central Alaska. He also found some cores and microblades which led to the assumption of an earlier occupation of the site. Excavation in 1971 confirmed this view, but other interpretations of the site have been revised, especially in regard to the elaborate decorative techniques of the late prehistoric Athapaskans. The position of both later and earlier components of the site are discussed in relation to the Healy Lake sequence, using typological similarities and both obsidian and radiocarbon dates. (6)

McKusick, Mrs. Charmon R. (The Amerind Foundation) AVIAN STUDIES IN ARCHAEOLOGICAL INVESTIGATION AND INTERPRETATION. Although the identification of avian remains from southwestern archaeological sites was begun as an attempt to investigate prehistoric environment and possible climatic change, it has proved less satisfactory for this purpose than the study of the remains of small mammals. However, avian studies have provided information from which inferences may be drawn about non-material, intangible elements of culture such as vegetative zones utilized, seasonal activities, major cultural affiliations, trade relationships, and, coupled with information derived from worked bone, clues to social organization. Avian assemblages, if identified while excavation is still in progress, are useful for formulating hypotheses which can then be tested by excavation. (1)

McPherron, Alan (University of Pittsburgh) SCANNING ELECTRON MICROSCOPE STUDY OF BORERS FROM CAHOKIA AND FROM YUGOSLAVIA. Similarities and differences in inferred patterns of utilization are discussed, and the advantages of the scanning E.M. are illustrated. (7)

McVicker, Donald E. (Loyola University) EXPLORING THE RESEARCH AND LEARNING POTENTIAL OF THE "NEW ARCHAEOLOGY." At Loyola in spring of 1971, 5 graduate and 4 undergraduate honors students elected to approach archaeological method and theory through a research seminar on modern cemeteries co-coordinated by the author and Margaret Hardin-Friedrich. A small, century old, inner-Chicago, Catholic cemetery was chosen for detailed study. The first task was to define "cemetery" in terms of activity areas and residence patterns of the dead. The "hypothetico-deductive method," and the assumptions of the "New Archaeology" were taken for the methodological model. The goal of the seminar was to design a series of coordinated projects which would test the relationship between the known developmental and social features of the cemetery, and those which could be recovered from the archaeological data. (4)

Melanich, Jerald T. (Smithsonian Institution) THE SPECIFIC EVOLUTION OF THE COASTAL AND MIDDLE EASTERN TRADITIONS IN GEORGIA. From ca. 2000 B.C. until ca. A.D. 600 the coastal strand of Georgia was successively occupied by phases of the Coastal tradition. These phases—Sapelo, St. Simons, Deptford, and Wilmington—are characterized by economic adaptations to the salt marsh and other micro-environments of the strand, especially the live oak hammocks. Some transhumance into the river valleys of the Coastal Plain pine forest is indicated. In contrast, the Middle Eastern tradition—tentatively composed of an unnamed late Archaic phase, the Kellogg phase, and the Cartersville phase—was adapted to the upper piedmont (200 to 500 meters above sea level) broadleaf forests. Seasonal exploitation of microenvironmental resources, e.g., fish, shellfish, and forest pro-

ducts (especially nuts), was greater than in the Coastal tradition. After ca. 100 B.C., the beginning of the Cartersville phase, nomadic, maize gardening seems probable. (15)

Meyer, William (U.S. Geological Survey) INTRODUCTION TO REMOTE SENSING. The electromagnetic spectrum, encompassing all radiation waves, ranges from cosmic rays (wavelength of  $10^{-16}$  meters) to radio waves (wavelength of  $10^5$  meters). Except in specialized fields such as physics, earth scientists were mainly confined until the 1960s to scientific measurement obtainable only within a small portion of the spectrum; that is, visible wavelengths. Since the 1960s, however, data on the reflectance, radiation, and fluorescence of the land and water surfaces ranging over the spectrum from the ultraviolet to radio waves have become available to nearly all scientific disciplines. Quality of these data are continually improving. (2)

Michie, James L. (University of South Carolina) EARLY MAN IN SOUTH CAROLINA. Early man research in South Carolina was oriented towards the occurrence, distribution and typology of pre-Archaic tools and projectile points. It also deals in part with external relationships. The accumulation of information and the varied typology of tools and projectile points suggests that Early Man favored the areas of the Fall Line and the Coastal Plain. The Piedmont has failed to demonstrate a varied typology or great occurrence of early material. (24)

Miller, Arthur G. (Yale University) THE ARCHAEOLOGICAL IMPLICATIONS OF THE ARCHITECTURE AND MURAL PAINTING AT TULUM, QUINTANA ROO, MEXICO, A PRELIMINARY REPORT OF THE QUINTANA ROO MURAL PAINTING PROJECT, 1971-1972. During December 1971-January 1972, The Center for Pre-Columbian Studies, Dumbarton Oaks, Washington, D.C., began an intensive program of salvage archaeology in the state of Quintana Roo, Mexico, concentrating on recording the important mural painting and architecture at the Post Classic Maya site of Tulum. The few paintings recorded by Lothrop in the 1920s and Fernandez in the 1930s were found to be misrepresented in their publications. The murals of Tulum and the neighboring site of Tancah are being recorded by the Mexican artist Felipe Dávalos. One result of this season's work has been the identification of 2 distinct periods of Mexican influence at Tulum on the basis of an analysis of the style and iconography of the painting and architecture. (26)

Miller, Donald S. (U.S. Forest Service) THE TRANSITION FROM "SALVAGE" TO "RESEARCH" ARCHAEOLOGY ON THE NATIONAL FORESTS IN CALIFORNIA. "Salvage Archaeology" is representative of a particular period in the development of contemporary American archaeology. The conceptual and operational models that were associated with it are no longer valid, i.e., they simply do not work. It is shown that present-day U.S. Forest Service multiple-use concepts of land management are more amenable to the research interests of so-called "New Archaeology" than to traditional "Salvage Archaeology." Examples of the absorption of "Salvage Archaeology" into "Research Archaeology" will be drawn from programs in California as a means of clarifying the dictum: Salvage Archaeology is Dead. (16)

Moratto, Michael J. (San Francisco State College) PALEODEMOGRAPHY IN THE WESTERN SIERRA NEVADA, CALIFORNIA. Recent excavations and new radiocarbon dates indicate that much of the western Sierra Nevada in California was not inhabited until after 500 B.C., as compared with known occupations 3 to 5 millennia earlier in adjacent regions to the west and east. The apparently retarded settlement of the western Sierra is particularly surprising in light of the fact that trans-Sierran trade can be traced over a span of some 7000 years. Explanations are proposed in terms of ecologic variables unique to the Sierra foothills and the schedule of adaptive technologic innovations throughout central California. (17)

Morenon, E. Pierre (see Anderson, Keith M.)

Morris, Craig (Brandeis University) NEW EVIDENCE ON INCA URBANISM FROM HUANUCO PAMPA. The first season's work at Huanuco Pampa produced a substantial quantity of new information on Inca provincial cities. Most noteworthy is an increased understanding of the rather unusual residential patterns and the discovery of a large and rigidly planned craft production complex. The report will deal briefly with these and progress on the map of the city. (25)

Morris, Don P. (National Park Service) TERMINAL SUBSISTENCE PATTERNS IN CANYON DE CHELLY, ARIZONA. Archaeological excavations at Antelope House, Canyon del Muerto, Arizona, are summarized. Analysis of vegetal trash from between closely spaced floors demonstrates that maize declines in frequency in late PIII times, just prior to site abandonment, with a corresponding increase in the collection of noncultivars. Cucurbits may have continued in cultivation until abandonment. (18)

Morris, Elizabeth Ann (see Flayhardt, R. A.)

Mueller, James W. (State College at Bridgewater) EXPERIMENTAL ARCHAEOLOGY: THE USE OF SAMPLING IN ARCHAEOLOGICAL SURVEY, PART I. Almost 500 sites in northern Arizona are used in an experiment concerning statistically valid methods of sample

surveying. In the experiment, the results of the Paria Plateau Survey are compared to the results of simulated surveys based on simple random, systematic, stratified, cluster, and vector techniques (and combinations), as well as "grab" and right-of-way samples. Also, sampling units, fractions, and repetitions are evaluated. Chi-square and relative economy based on actual survey costs are used for quantitative evaluation. (4)

Nash, Ronald J. (Manitoba Museum of Man and Nature) ARCHAEOLOGICAL INVESTIGATIONS IN THE TRANSITIONAL FOREST ZONE: NORTHERN MANITOBA; SOUTHERN KEEWATIN, N.W.T. Between 1965 and 1971, the author conducted a general archaeological investigation in the open forest of the central sub-Arctic. Preliminary analysis of some 230 sites suggests a substantive Paleo-Indian occupation, some early archaic occupation and a greater late archaic occupation. Unlike the adjacent tundra coast of Hudson Bay, the forested interior contained no specialized edge-area cultures, nor was there evidence of the prehistoric Eskimo cultures known from the coast. Aided by the method of the Direct Historical Approach, the research suggests that the Chipewyan have been residents for at least 1000 years. The entire cultural sequence reflects minimal cultural evolution—a situation discussed with reference to a homeostatic model and historical evidence. (6)

Neely, James A. (University of Texas, Austin) PREHISTORIC DOMESTIC WATER SUPPLIES AND IRRIGATION SYSTEMS AT MONTE ALBAN, MEXICO. A preliminary investigation of the site of Monte Alban has determined the presence of at least 2 dammed reservoirs and one major canal system. Associated ceramics are predominantly late Monte Alban I and Monte Alban II types, but a longer span of use is indicated. The location, association, dating, and function of each of these systems is discussed in relation to the currently known history of the site. Much of the information is tentative, based on a brief surface survey. However, more details are available for the canal system and associated agricultural terraces due to the excavation of small exploratory trenches. (13)

Nelson, Sarah Milledge (University of Michigan) EARLY SETTLED VILLAGES IN KOREA: EVIDENCE OF INCIPENT FOOD PRODUCTION. Recent archaeological research in central Korea indicates that it was a center of early sedentary communities. This paper presents the evidence and reasoning leading to the conclusion that such communities were based on plant cultivation. (8)

Noakes, John E. (see Schneider, Kent A.)

Norton, Presley (Foundation for Ecuadorian Anthropological Studies) COMPARISON OF 2 EARLY FORMATIVE SITES IN ECUADOR. A comparison of cultural material recently excavated at Punta Concepcion, where the Columbia University Survey of Sta. Elena Peninsula made a collection in 1966 (OGSE 42 Lanning 1968) with material from our inland Early Valdivia site at Loma Alta indicates that the occupations were roughly contemporaneous, representing the earliest known Valdivia pottery. Certain similarities and differences in occupation refuse indicate that Loma Alta was a permanent settlement while OGSE 42 was a seasonal campsite occupied exclusively for the purpose of gathering mollusks from the surrounding tidal flats by groups who normally lived inland. Also, traces of varnish on some sherds and stone figurines at both sites point to a possible Amazonian derivation. (25)

Nunley, Parker (El Centro College) GATHERING SOCIETIES: A NEW MODEL FOR ARCHAEOLOGISTS. This paper points out some discrepancies between ethnographic data and concepts of hunting and gathering societies frequently used in archaeological interpretation. Generalizations are inductively derived from ethnographic data and presented as a set of viable expectations. These expectations form part of a new conceptual scheme for collecting and interpreting archaeological data within the larger framework of anthropological theory. (5)

O'Brien, Patricia J. (Kansas State University) STEED-KISKER MISSISSIPPIAN AND LABOR SPECIALIZATION. Recent work on Steed-Kisker sites in the Kansas City, Missouri, area has revealed some interesting data. In a previous report there was some information to suggest specialization of labor, either intra-village or inter-village. Chi-square analyses of the tool categories found in two burnt houses of the Priddy-Young site (23PL4) and one burnt house of the Coons site (23PL16) indicate statistically significant differences in the assemblages present. The data suggest the 2 houses from 23PL4 are not statistically different from each other, but they are quite different (statistically) from the 23PL16 house. Therefore these data point to inter-village specialization of labor within this culture. Considering the new evidence of the ties of this complex with Cahokia, specifically a Ramey Incised rim sherd from beneath the 23PL16 house, such specialization is not too surprising. (17)

Olsen, Stanley J. (Florida State University) THE WATER RESOURCES AND AQUATIC FAUNA OF GRASSHOPPER PUEBLO. More often than not, writers describing the abandonment of the early southwestern pueblos attribute this movement to "sparse rainfall accompanied by severe winters" or to "a great drought of 23 years." These statements are usually supported by evidence obtained from tree ring comparisons taken from excavated timbers and from increment borings from older living trees of the area. Little else is usually

added. Man is able to substitute or do without many things that contribute to his every day pattern of living but water is not one of them. Grasshopper Ruin has produced a variety of interesting sources from which one can speculate as to what the water supply was like during the occupation. These include stream bed sediments, aquatic invertebrates and vertebrates, as well as other animals usually associated with a stream or pond environment. (1)

O'Neill, George C. (City College of the City University of New York) ARCHAEOLOGICAL EXCAVATIONS IN THE SOUTHERN VALLEY OF MEXICO: CHALCO, XICO, AND ASTAHUACO (abstract not received). (26)

Painter, Floyd (The Chesapeakean) PALEO MAN'S TOOL KIT: SPECIAL TOOLS FROM THE WILLIAMSON PALEO WORKSHOP SITE. Little known and unreported tool types from a large and long-utilized workshop and habitation site near the Atlantic seaboard. Tools seldom or never found on kill sites and small, short-period campsites are illustrated and discussed. (24)

Palacio, J. O. (Ministry of Trade and Industry, Belmopan, British Honduras) A BRIEF REVIEW OF THE DEVELOPMENT OF ARCHAEOLOGY IN BRITISH HONDURAS. An attempt is to be made to trace the development of archaeology in British Honduras in the past decade: (a) in the administration of archaeology as a government department, (b) in the technical information which research has yielded on the culture history of the Maya in this area. Some stress will be put on data pertaining to settlement patterns, the use of caves, and the importance of this part of the Caribbean Sea Coast for Maya trade. Finally, there will be a brief summary of some remaining outstanding archaeological problems as well as a statement on the government's interest in attracting large-scale archaeological research programs. (26)

Paradis, Louise Isent (Yale University) THE OLMEC VIEWED FROM THE MIDDLE BALSAS, GUERRERO. An Olmec stela was discovered in Amuco de la Reforma, on a southern tributary of the middle Balsas, in 1967. Fieldwork done during 1970-71 and a preliminary analysis of the material seem to show that Olmec presence, in that part of Guerrero at least, is minor and selective. No Olmec or Olmec-like ceramics were found, but 2 masicos (one small sadeite mask from a looted corn field in Pineda; one ceramic mask in stratigraphic context from amuco) were encountered. A radiocarbon date would help date the Olmec in the Middle Balsas. (26)

Parmalee, Paul W. (Illinois State Museum) FAUNAL REMAINS FROM THE CAHOKIA SITE COMPLEX. Excavation of mounds and village areas at the huge Mississippian site of Cahokia, located near East St. Louis, during the past 2 decades has yielded tremendous quantities of bone and shell remains. Most of the faunal materials have come from refuse pits, general village debris and mound fill; artifacts, including such items as bone awls and marine shell beads, have also been recovered in some quantity in both the middens and with burials. The Cahokian inhabitants depended to a large extent upon animals for their basic food requirements; fishing, gathering and collecting small game, and the hunting of larger species must have been a constant and major activity in the effort to provide sufficient food for an apparently large local population. The white-tailed deer formed the basic meat staple in the diet of these people, although a wide variety of other species including birds (especially waterfowl), small mammals such as the squirrels, and fish (particularly catfish and buffalo) played a significant role as day-to-day supplements in the overall food economy. Recovery of a variety of species of marine mollusks, several of which occurred in great quantities, many which were modified as beads and pendants, suggests trade routes to or contacts with the Gulf Coast area of southeastern United States. (10)

Patterson, Clair C. (California Institute of Technology) THE DEVELOPMENT OF ARSENIC-COPPER ALLOYS IN PERU DURING MIDDLE HORIZON TIMES. The history of native metallurgy in South America shows that it developed in successive stages of increasing technological complexity during the period 1800 B.C.-A.D. 1500. The European invasion terminated this development at the bronze alloy stage and did not allow South Americans to discover by themselves later and more sophisticated techniques such as bellows, sulfide smelting, silver cupulation, and steel making. These latter techniques should have been introduced during transoceanic contacts at any time after 1800 B.C. by Asian or Phoenician voyagers if they had been influential in starting metallurgy in the New World. The fact that the orderly succession of metallurgical development in South America paralleled a sequence carried out about 6000 years earlier in Southwest Asia, and that the later sequence in South America was not altered or dislocated by the introduction of advanced techniques from the outside, proves that the development of South American metallurgy was indigenous. (21)

Patterson, Thomas C. (Temple University) RELATIONSHIPS BETWEEN THE CENTRAL COAST OF PERU AND OTHER AREAS IN PREHISTORIC TIMES. This paper examines the changing patterns of coastal relations with other areas in South America during the prehistoric period. Data from the central Peruvian coast indicate relationships, both direct and indirect, with the montaña and the highlands. (12)

Paulsen, Allison C. (Rye, New York) PREHISTORIC TRADE BETWEEN SOUTH COASTAL ECUADOR AND OTHER PARTS OF THE ANDES. Evidence for prehistoric trade contacts between south coastal Ecuador and other parts of the Andes is reviewed in the light of recent research. Inter-regional similarities between coastal and highland ceramics are now believed to have existed until the early part of the first millennium B.C. However, long distance trade in obsidian, shell, and copper began some centuries earlier than that date, and lasted until the Spanish conquest in A.D. 1532. Each of these 3 regional specialties is described, and the direction and chronology of their exchange are outlined, attempting to place this trade network within a broad outline of Andean prehistory. (12)

Penton, Daniel T. (Florida Bureau of Historic Sites) SALVAGE EXCAVATIONS AT HUTTO POND, MADISON COUNTY, FLORIDA. The Hutto Pond site represents a long sequence of short-term occupations, spanning 8-10,000 years. Scattered Early Archaic materials were encountered, but the majority of artifacts range from Deptford through a presumed prehistoric Western Timucuan component. Very little subsistence data were recovered, and almost nothing was encountered indicating a permanent or semi-permanent settlement. The site appears to be indicative of temporary, but recurring, exploitation of a natural resource or resources over a substantial length of time. (9)

Peske, G. Richard (University of Wisconsin, Milwaukee) RESEARCH AND TRAINING STUDENTS IN THE FIELD: CHAOS OR HARMONY? A summary of a University of Wisconsin, Milwaukee, archaeological field school at Washington Island, Wisconsin, is presented in terms of developing student expertise in archaeological methods and techniques while combining teaching with archaeological research design. (20)

Peterson, Curtiss E. (Florida Bureau of Historic Sites and Properties) A WOODEN ABORIGINAL FIGURINE AND POST MORTAR FROM FLORIDA. In December, 1971, an aboriginal figurine was donated to the Florida Division of Parks and Recreation. It was collected in Tomoka State Park, on the east coast of central Florida, by a dredge operator working in the park. It is anthropomorphic and gives an Indian's eye view of pre-Columbian Indians in Florida. The post mortar was recovered from mud in the bottom of the Aucilla River in northern Florida and is an example of aboriginal utilitarian woodworking. Wood identification and radiocarbon dating are currently being done on both objects. (9)

Peterson, David A. (Institute of Oaxaca Studies) REPORT ON THE INSTITUTE OF OAXACA STUDIES Isthmic Region Mapping Project: COMPLETED MAP OF A PYRAMID AND "PALACE" AREA ON GUIENGOLA MOUNTAIN. The site center at Guiengola, a 54,000 square meter area containing 2 large pyramids and other structures as well as Seler's (1901) "palace" area, has been mapped by crews of the Institute of Oaxaca Studies. The recent map reveals many errors in earlier maps of the same site. (26)

Phagan, Carl (Ohio State University) THE CONCEPT OF RELATIVE MASSES AS A PERSPECTIVE IN DEFINING AND SOLVING PROBLEMS IN LITHIC TECHNOLOGY: AN EXAMPLE OF ITS APPLICATION TO PROBLEMS OF "FLUTING." Problems in lithic technology are seen from an organizing perspective of relative masses involved in the removal of flakes or blades from nuclei. The perspective may prove helpful in both defining problems and in providing a framework within which to seek solutions. This paper briefly outlines the use of this perspective in the particular case of problems surrounding the "fluting" technology of early American lithic assemblages, and suggestions are made for its application to other problem areas. (23)

Phelps, David Sutton (East Carolina University) SWIFT CREEK IN NORTHWEST FLORIDA. The primary concern of this paper is a summary of the Middle Woodland Swift Creek phase on the North Florida Gulf Coast. The older phase terminology, Santa Rosa-Swift Creek, has been shifted to refer to 2 regional phases based on observable differences. The Santa Rosa phase occupied the area bounded on the east by the Apalachicola River and extending westward to Mobile Bay; from the Apalachicola eastward, the phase is Swift Creek. (15)

Pickering, Robert B. (Southern Illinois University) PRELIMINARY REPORT ON OSTEOLOGICAL REMAINS FROM ALTA VISTA, ZACATECAS. Observation from the field indicated that the distribution of the various bones did not follow the expected burial pattern. The remains included over 1300 isolated or disarticulated human bones. It was also noted that certain isolated bones were found more frequently in some areas than others. Preliminary analysis at the Center for West Mexican Studies in Ajijic, Jalisco, brought to light the presence of certain pathologies and discrete traits. Also, at least 2 cases of bones having been cut transversely across the joints were noted. Because of the quantity and relatively good condition of the bones, the Alta Vista excavation lends itself to an in depth study using physical anthropology as a method for gleaning badly needed information about the Chalchihuites Culture of West Mexico. (26)

Plog, Fred (University of California, Los Angeles) THE ARCHAEOLOGIST'S CONCEPT OF TIME. Many of the questions that ethnographers and other social scientists working with modern data have asked concerning culture change are largely unanswerable given the synchronic data with which they work. While the archaeologist works with diachronic data appropriate to such questions, his tendency to borrow ethnographic concepts and models of

time prevents a full utilization of these data. The strengths and weaknesses of alternative models of time for understanding culture change and doing archaeology are considered. (5)

Plog, Fred (see Hill, James N.)

Plog, Stephen (University of Michigan) THE RELATIVE EFFICIENCIES OF SAMPLING TECHNIQUES FOR ARCHAEOLOGICAL SURVEYS. Several prehistorians have proposed that probability sampling should be used in archaeological research. However, no evidence is available as to which sampling techniques are most efficient for archaeological data. Using data from 3 completely surveyed areas in the Valley of Oaxaca, Mexico, various sampling techniques are employed to draw samples and estimate the number of sites in each area. The squared standard errors of the mean estimates are compared. The conclusions are: (1) transect samples are more efficient than quadrats, (2) a "small" sampling unit is more efficient than a "large" unit, and (3) a stratified sample is the most efficient sampling design. (17)

Pollard, Gordon C. (State University of New York, Plattsburgh) SEDENTISM AND DESERT ADAPTATION IN N. CHILE. Data derived from archaeological research in the central Atacama Desert of N. Chile is used to construct a model of the process of sedentism. Major variables of the culture/environment system are utilized to delineate degrees of sedentism for several culture phases in the Chilean sequence (500 B.C.-A.D. 400). Special attention is given to new evidence relating to the presence of domestic Lama spp. and their role in the sedentary process. (25)

Potter, David F. (Tulane University) A LATE CLASSIC PERIOD PALACE AND OTHER STRUCTURES AT BECAN. Structure IV, a very unusual structure excavated during the 1970 and 1971 seasons, had attributes comparable to other prehistoric Maya structures thought to have been ceremonial in function but other characteristics make this structure appear to have been primarily residential in use. It was constructed just prior to the "collapse" over a still earlier structure which probably was a temple-pyramid. In addition to Structure IV, Becan had other stylistically and functionally interesting structures which were the subject of preliminary investigations. (3)

Pratt, Peter P. (State University of New York, Oswego) SUNY, OSWEGO, FIELD SCHOOL IN ARCHAEOLOGY. The evolution of a field school-leading to problem orientation, multi-institutional assistance, intensified training, the preparation of "micro-site reports" and a field school manual. (20)

Proulx, Donald A. (University of Massachusetts) EARLY HORIZON SITES IN THE NEPENA VALLEY, PERU. A recent survey of the Nepena Valley on the north coast of Peru revealed a number of probable Early Horizon sites. These include some extensive stone-walled settlements in the upper valley in addition to the well-known temples of Punkuri and Cerro Blanco in the lower valley. This paper will examine the nature of these early sites, comparing them with other Chavinoid sites in northern Peru. (25)

Puleston, Dennis E. (University of Minnesota) THE ROLE OF SEMI-DOMESTICATED ANIMAL RESOURCES IN MIDDLE AMERICAN SUBSISTENCE. While it is generally recognized that pre-Columbian Middle Americans made significant use of a broad range of domesticated plants, it is often stated that apart from the turkey and dog they were without domesticated animals. A review of the literature reveals that acceptance of this cliché has obscured the surprisingly significant role played by numerous "semi-domesticated" insects, fish, birds, and mammals. The way in which the distinction between domesticated and non-domesticated has retarded our understanding of native American animal resource manipulation will be examined. (14)

Puleston, Olga S. (University of Minnesota) AN ANCIENT MAYA WORKSHOP: CONTENT AND FUNCTION. The problem of specialization has long been a focus of interest in the Maya area. The discovery of a unique flint tool kit at Tikal, Guatemala, has provided an unusual opportunity to study the form and function of the contents of a workshop. It was composed of small pointed blade-like tools, burins, and flat thin flakes, some of which were notched. Microscopic analysis of wear patterns revealed that these tools were used for creating specific shapes out of bone or wood. The similarity between the functional parts of the workshop and other tools in North America, may suggest that the functions performed by this tool kit have a wide distribution. (26)

Purdy, Barbara A. (Florida State Museum) THE IMPORTANCE OF QUARRY SITES. The full range of premetal man's ability to work stone cannot be discerned by a study of lithic debris recovered from habitation sites. Examinations of outcrop detritus supply valuable information pertaining to quarrying operations and to techniques involved in the production of chipped stone implements. In addition, an analysis of these remains should provide clues to the many tasks performed at quarry sites such as the manufacture of various kinds of wood and bone tools. Many new methods now available, which facilitate the interpretation of archaeological data, could be effectively utilized in analyzing lithic remains from quarry sites. (17)

Purrington, Burton L. (Appalachian State University) A REAPPRAISAL OF THE C&O MOUNDS AND ADENA OCCUPATION OF THE EASTERN KENTUCKY MOUNTAINS. Traditionally the rugged mountain area of eastern Kentucky has been included within the range of Adena culture. Recent studies indicate that the C&O mounds, the best known mountain Adena sites, represent a series of Adena site-unit intrusions apparently confined to the Levisa Fork of the Big Sandy River—the most open, accessible, and agriculturally productive route into the mountains. Though formerly treated as a unit, the 2 C&O mounds show significant cultural and apparently temporal differences. Contemporaneous "Woodland" cultures in other areas of the mountains have an indigenous Archaic base plus a variety of highly localized ceramic styles. (9)

Rafferty, Janet (University of Washington) THE NATURE OF THE ADENA-FORT ANCIENT TRANSITION IN NORTHERN KENTUCKY. Evidence from an apparently early Ft. Ancient burial-mound-village site in Northern Kentucky indicates that certain ceramic styles are continuous from limestone-tempered to shell-tempered pottery. The former is generally regarded as Adena in affiliation. Its presence at this site, as well as the continuation of styles like handles, rim features, and decoration, implies a developmental relationship between Adena and Ft. Ancient in this area. (9)

Rathje, William L. (University of Arizona), and Jeremy A. Sabloff (Harvard University) COZUMEL, QUINTANA ROO, MEXICO: ONE TEST OF A MODEL OF CULTURAL FLUIDITY AND PORTS OF TRADE. Most sites studied by archaeologists have "typified" a specific cultural tradition. The nodes where cultures interact are also important. This paper will present one test of a model which states that cultural groups which subsist solely as trade intermediaries have a fluidity of political orientation and cultural norms that enable them to adapt readily to changes in political and economic realities. The Island of Cozumel, Quintana Roo, Mexico, was a trade interaction node during the Postclassic in Mesoamerica. Cozumel's adherence to the model of a pragmatically fluid commercial system will be illustrated with ethnohistoric data. (14)

Scott, Raymond (University of Calgary) SOME SPECULATIONS ON THE ECONOMIC IMPORTANCE OF THE UPPER MONTANA OF PERU TO PREHISTORIC HIGHLAND CIVILIZATIONS. The importance of the forested eastern slopes and valleys of the Andes to the central Andean civilizations has been repeatedly deemphasized by archaeologists and anthropologists. Some have argued that the rugged terrain and dense vegetation of the ceja prevented the highland peoples from conquering, colonizing, or otherwise exploiting this vast region to the east. Archaeological and historical data from the montaña and sierra of the Department of Ayacucho are used to support a theory that there was repeated colonization of selected areas of the montaña during the later prehistoric and historic periods of Peruvian prehistory. The Middle Horizon is suggested as the possible time for the onset of such colonizations. The possibility that the montaña may have served as a "Banana Republic" to the Huari Empire is offered. (12)

Redman, Charles L. (New York University) EARLY VILLAGE TOOL TECHNOLOGY. An approach is presented to the classification and functional understanding of prehistoric tools through a combination of microscopic observations, metrical measurements, and collateral sources, such as results of experiments, ethnographic analogies, and knowledge of mechanics. In this manner it is possible not only to propose, but to test the hypothesized function of a tool type. The artifacts used as an example in this study come from the eighth millennium early village site of Cayonu in southeastern Turkey. Chipped stone, ground stone, and bone objects are treated, and it is suggested that the normally assumed function of many artifacts must be revised. (5)

Read, Dwight W. (University of California, Los Angeles) THE USE AND EFFICACY OF RANDOM SAMPLES IN REGIONAL SURVEYS. As archaeologists shift from an emphasis on individual sites to an investigation of the interrelationships between and among sites in a given geographic area, the necessity for a random sampling procedure becomes acute. For all but the smallest of regions, the possibility of a 100% sample is not possible. A random sampling program is needed. Random sampling includes a variety of techniques. The choice of sampling method will depend on the questions being asked and the type of statistical analysis being done. The aid of all these techniques is to permit accurate generalizations from the sampled portion of a region to the entire region. (17)

Read, Dwight W. (see Hill, James N.)

Reeves, Brian (University of Calgary) LATE PALEO-INDIAN (ca. 8000-5500 B.C.) LAND/RESOURCE UTILIZATION PATTERNS IN WATERTON LAKES NATIONAL PARK. The Late Paleo-Indian (8000-5500 B.C.) period is represented by 12 archaeological sites, associated with 3 of the 5 life zones of the Park and a variety of geographic locales. Site typology and distributions are discussed, along with the environmental parameters extant during this interval. Evaluation of the latter suggests that the only major effect of the last valley glaciation (6500 B.C.) was to limit the available areas for occupation in the higher montane valleys. (24)

Reeves, C. H. (University of New Mexico) A REEXAMINATION OF THE VALIDITY OF NORTHERN ADAPTIVE STRATEGIES. Much has been written, both archaeologically and

ethnologically, about the adaptive dichotomy in the Circum-Polar region of North America. Those arguing against separate adaptations stress the universal reliance in this area on caribou as the primary subsistence strategy. This paper will first focus on the concept of adaptation; then, using Liebig's Law of the Minimum, will examine life in the North during the winter months when survival stress is at a maximum. (6)

Reid, J. Jefferson (see Wilcox, David R.)

Reyman, Jonathan E. (Southern Illinois University) THE QUETZALCOATL-TEZCATLIPOCA CONFLICT AT TULA: AN ALTERNATIVE HYPOTHESIS. Following the expulsion of Topiltzin Quetzalcoatl from Tula by the priesthood of Tezcatlipoca, the foremost deity represented in the new artwork, especially friezes, is not Tezcatlipoca but Quetzalcoatl. The paradox of a peaceful god in this militaristic setting and the general de-emphasis of the victorious Tezcatlipoca have puzzled scholars. It is suggested that the solution to the apparent paradox lies in the dualistic nature of Mexican religion and the need to preserve continuity in a time of political and social unrest. (14)

Rick, John W. (University of California, Santa Cruz) HEAT ALTERED CHERTS OF THE LOWER ILLINOIS VALLEY. A specific study of the heat treatment of cherts from the lower Illinois Valley has shown a high degree of variability of color change and material improvement. Variable tolerance of heat within one chert formation has implication for the selection of raw materials during the Middle woodland period. Differential improvement within the same formation would also be expected to influence raw material choice. (17)

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

Rock, James T. (University of Arizona) BEHAVIORAL CHAIN ACTIVITY CLUSTERS AT GRASSHOPPER: ARIZ. P:14:1. In this research a method for utilization of ethnographic analogy in an empirically verifiable manner is proposed and tested. This approach is utilized to support archaeological behavioral inference about prehistoric Pueblo activity sets. By extracting the structural principles from ethnographic activity sets, the investigator is able to deduct test implications and their variables that are empirical in their nature. Since the ethnographic data in this form are quantifiable, the archaeological arrays can be analyzed in the same manner, and the data obtained lend themselves to inference about the behavioral relationships that existed in the prehistoric activity sets. In the testing, the focus is on the activity sets as they exist in a behavioral chain. Each chain is composed of a number of events and any of these events can be represented by the material arrays investigated. Activity sets were not static events, but part of a dynamic continuum from starting point to completion. The objective of the research is to yield empirical support to ethnographically based behavioral assumptions that are made about the archaeological situation. The behavioral interpretation is based not directly on the material cultural array, but on the relationships that existed between the material and social variables that were involved in the process. It is these relationships, as they are located in time and space along the behavioral chain sequence, that indicate the actual behavior that once existed in the now extinct system. (18)

Roe, Peter G. (University of Illinois) THE CUMANCAYA CULTURE AND ITS RELATIONSHIPS TO THE SIERRA. The ceramic industry of the ninth century A.D. Cumancaya culture of the Peruvian selva, Ucayali River region, is comparable to certain archaeological complexes of the sierra of Peru, Ecuador, and Colombia. The presence of annular and pedestal-based open bowls associated with elaborate negative-resist decoration and incision in Cumancaya pottery relates more closely to Ecuador, where these traits are very common in a whole series of assemblages including Tuncahuán and Carchi, than to either highland Peru or Colombia. (12)

Rose, Jerome, and James Wells (University of Massachusetts, Amherst) ANALYSIS OF THE MOUND 72 BURIALS, CAHOKIA. This paper will present the analysis of age and sex of the burials excavated from Mound 72, Cahokia. These data, in combination with postulated mortuary practices, indicate social stratification of the burials in the mound. This distribution of age and sex also demonstrates that the mass burials were probably the result of sacrifice. This is presented as a case study of the application of specialized sexing and aging methodology to fragmentary remains. (10)

Rothschild, Nan (New York University) SEXUAL ROLE AND STATUS IN PREHISTORIC SOCIETIES OF EASTERN NORTH AMERICA. In a project designed to define sexual status and sexual role during prehistoric times, 3400 burials from more than 30 sites east of the Mississippi River are being analyzed in detail. Sites have been chosen to represent a variety of cultures and different burial traditions. Characteristics of each burial and its associated artifacts have been recorded in a computer-compatible format. A preliminary statistical treatment of this material by site, by cultural unit, and by time period is in progress, correlating these variables with age and sex groupings. A preliminary hypothesis tests whether grave goods are randomly associated with individuals at death; the broader relationship between social structure and burial patterns will also be explored. (9)

Rovner, Irving (University of Wisconsin) IMPLICATIONS OF THE LITHIC ANALYSIS AT BECAN. Analysis of lithic materials deriving from excavations at Bechan and Chicanna in the

Rio Bec region has demonstrated that lithic types and complexes comparable in utility for culture-historic reconstruction to equivalent ceramic units may be established through study of change in form and working techniques. A lithic sequence for the Rio Bec region extending from Late Pre-Classic to Late Post Classic times is here presented and its implications are examined. (3)

Sabloff, Jeremy A. (see Rathje, William L.)

Salzer, Robert J. (Beloit College) INVESTIGATIONS OF THE MERRELL TRACT AT THE CAHOKIA SITE. Excavations were conducted by the Logan Museum of Anthropology, Beloit College, in selected areas of the Merrell tract at the Cahokia site during the summers of 1969 and 1971. Beloit cooperated with the University of Wisconsin, Milwaukee in a joint research project which was designed to ascertain the presence of a suspected series of stockade lines. Preliminary results of a combined program of controlled surface collection, aerial photography, and trenching excavation techniques have failed to provide unequivocal evidence of the putative stockade lines. However, surface collections and excavations have revealed the presence of a partially stratified sequence of a variety of architectural features and cultural debris in the southern half of the Merrell tract. These assemblages provide important insights into the nature of the utilization of this portion of the Cahokia site during early and late Mississippian times. (10)

Sarma, Akkaraju (Temple University) ENVIRONMENTAL MODELS APPLICABLE TO THE COASTAL REGIONS, ANDES, MONTANA AND THE TROPICAL FOREST. This paper will examine the relevance of environmental models applicable to the above regions. Basic data in the construction of models come from the coasts of Ecuador, whose marginal characteristics have provided uninterrupted data for the last 6000 years. (12)

Schambach, Frank (Arkansas Archeological Survey) DEER CEREMONIALISM IN EARLY CADDO CULTURE. Recent excavations at the Crenshaw site, a major early Caddo ceremonial center in southwest Arkansas, have disclosed a unique complex of features which indicate that deer ceremonialism, most probably in the form of hunting magic, was an important element in early Caddo culture. There is documentary evidence that this practice continued up through historic times. (9)

Schiffer, Michael B. (University of Arizona) A SYNTHETIC MODEL OF ARCHAEOLOGICAL INFERENCE. Despite the numerous programmatic statements in the literature concerning how best to go about deriving archaeological inferences, very little is actually known about the logic-empirical structure of inferences themselves. Based on what I consider are the 3 basic problems that must be resolved in the justification of any inference, a synthetic model is presented that lays bare the general structure of inference justification. Using this model, the views of Binford and Thompson on the product of archaeological inference are reconciled. (4)

Schneider, Kent A., John E. Noakes, and James Spaulsind (University of Georgia) TRACING THE ORIGINS OF GEORGIA COPPER ARTIFACTS BY NEUTRON ACTIVATION ANALYSIS: II. Speculations on the origin and distribution of copper artifacts in the East are abundant; yet comparatively few studies have examined the elemental compositions of these artifacts to objectively determine their natural and cultural occurrences. Neutron activation analysis permits quantitative and qualitative determination of trace elements in copper artifacts and native copper ores. This information may allow local and regional comparison of such artifacts and ores from which they may have been derived independent of stylistic considerations. Recent investigations at the University of Georgia on selected copper samples from Mississippi, Michigan, and Georgia using neutron activation analysis will be discussed. (22)

Schoenwetter, James (Arizona State University) ARCHAEOLOGICAL POLLEN STUDIES IN THE LOWER ILLINOIS RIVER VALLEY. Pollen records have been recovered from three archaeological sites, 2 backwater lake deposits, and about 90 modern plant associations. Most of the sediments representing ancient horizons are poor pollen traps, necessitating analysis at a statistical level far below that normally considered desirable. The resulting level of interpretation cannot exploit the full potential of the pollen analytic method. It is clear, however, that local archaeological problems can be investigated reliably through pollen analysis when pollen study is conceived of primarily as an independent means of investigating issues approached simultaneously through other techniques. Interpretations developed so far refer to phytogeographic reconstruction, problems of chronology, and relationships between macro-fossil and palynological botanical records. It appears that the fossil pollen record is more suitable to interpretation as regards climatic and/or micro-environment changes than as regards plant community analysis. It is clear that on some archaeological horizons, notably the Late Archaic and the Havana Hopewell Horizons, pollen studies may serve to refine intra-site chronological units. It also appears that the fossil pollen record serves to amplify the macro-fossil botanical record regarding utilized plants, but not to conform with the expectation that micro- and macro-fossil studies would be complementary in reconstructing prior environmental conditions. The pollen record, for example, reveals utilization of maize in Archaic time (ca. 2000 B.C.), which macro-fossil studies do not indicate. Alternatively, macro-fossil studies argue for a lack of environmental change affecting the density and distribution of utilized resources. The pollen

record, on the other hand, argues for the occurrence of rather dramatic changes in climate and local environment over the same time-span. (22)

Scott, Stuart D., and Charles Cazeau (State University of New York, Buffalo) ARCHAEOLOGICAL FIELD SCHOOL IN SINALOA, MEXICO. The State University of New York at Buffalo operates a summer field school on the west coastal plain of Mexico, 80 miles south of Sinaloa. Both research and teaching-training aspects are expanded through a cross-disciplinary address to environmental and cultural questions related to coastal prehistory. The organization has a threefold interest: (1) undergraduate training in archaeology, (2) graduate training and research in all disciplines (e.g., geology, paleoecology, ethnozoology, etc.), (3) faculty multidisciplinary research. (20)

Scott, Stuart (see Furst, Peter T.)

Sedat, David W. (Claremont Graduate School) THE PRECLASSIC LOWLAND MAYA AND THEIR NORTHERN HIGHLAND NEIGHBORS. Recent archaeological investigations in the Alta Verapaz region of the northern Maya highlands have revealed evidences of occupation dating from the Middle Preclassic (ca. 900-400 B.C.), or some 700 years earlier than previously known for this area. This paper briefly summarizes the results of this research and discusses our present understanding of Preclassic highland-lowland interactions with emphasis on the question of the origins of the earliest settlers in the southern Maya lowlands. (14)

Shafer, Harry J. (University of Texas) LITHIC TECHNOLOGY INVESTIGATIONS AT THE GEORGE C. DAVIS SITE, AN EARLY CADDOAN SITE IN EAST TEXAS. The lithic technology study of the George C. Davis site materials provides for an interesting test of the Leslie White theory that technology is a determinant of the social system. A decline in the complexity of the social system is recognized at the Davis site and it is hypothesized that this will be reflected in the lithic technology. It is suggested that this change resulted in a greater exploitation of local resources; the nature of these resources required reduction techniques different from those used to exploit non-local materials. This paper reports (1) the initial results in attempts to differentiate the reduction techniques used by the Caddo from those of earlier cultures in the area; (2) the reduction methods used in exploiting the local and non-local stone; (3) significant technological changes hinted by the functional and distributional relationships between local and non-local materials. (17)

Shaw, Harold R. (Royal Ontario Museum) THE "CEREMONIAL BAR" AS A CLUE TO MAYA MIGRATION AND TRADE ROUTES. This paper considers the evidence indicating the probable land routes which centered on Tikal and radiated to Copan in the south, Coba in the northeast, and Uxmal in the northwest. The paper suggests that the sites of Naranjo and Calakmul were major assembly and transfer points of trade goods, and that numerous lesser sites served as overnight cargo stops. The "Ceremonial Bar," a distinctive emblem usually portrayed in the hands of the principal figure on Maya stelae and lintels, may provide a useful clue in tracing the time and extent of movement and migration. Considered as a clan or dynastic totem, the appearance of a specific type of "Ceremonial Bar" on a dated monument is an indication of migration or of colonization by members of a parent clan. The paper discusses the implications of time and location of the Double-Headed Ceremonial Bar, the Manikin Scepter, Triplicate Staff, Tasseled Spear, and the "Mexican Invasion" at various Classic Maya sites. (26)

Shenk, J. Richard (Louisiana State University, New Orleans) EL CALON: A MONUMENTAL SHELLMOUND IN SOUTHERN SINALOA. El Calon, originally reported by estimation to be almost 100 feet in height with a volume of 12.5 million cubic feet was accurately mapped and sampled and has been shown to be only slightly less impressive than the original estimate. (26)

Shiner, Joel L. (Southern Methodist University) MICROWEAR STUDIES WITH THE SCANNING ELECTRON MICROSCOPE. More reliable data are desperately needed on what prehistoric people were doing. These data must be obtained by hypotheses and testing. The SEM permits high magnification examination of wear and polish on actual and replicated stone tools without loss of field depth. The micrographs provide excellent means of communicating results of the research. (7)

Sisson, Edward B. (R. S. Peabody Foundation) A PRECLASSIC CERAMIC SEQUENCE FOR THE WESTERN CHONTALPA, TABASCO, MEXICO. A chronological sequence of 5 ceramic complexes, based on data from limited test excavations and site survey, is described for the Western Chontalpa, Tabasco, Mexico. These complexes from key Mesoamerican subareas and possible relationships are discussed. (13)

Sisson, Edward B. (see Doelle, William)

Smith, Jason W. (Boise State College) LARGE-SCALE LAY ARCHAEOLOGY IN IDAHO. During 1971, a large scale program of organization of laymen interested in archaeology began to emerge in Idaho. In a relatively short period of time a great deal has been accomplished. Archaeological Society activity has been undertaken in the area of survey, testing, and intensive training programs. Political pressures in favor of legislation and administrative

decisions favoring the proper management of Idaho's archaeological resources is also an important area of amateur involvement. (8)

Sonin, Robert (Institute of Andean Studies) RESIST DECORATION OF MAYA POTTERY. In addition to the widespread, conventional type of resist decoration common in both North and South America, which consists of staining fired pottery with carbon in one form or another, there exists another type of resist technique which has hitherto remained undescribed. It was far more limited, both in time and distribution, than the conventional resist. It is confined to the Maya Late Classic and it flourished in the Peten, Quiche, and Alta Verapaz. This technique is a complete reversal of the previously recognized one. The Maya technique employed an organic resist on unfired pottery followed by special ceramic slips and washes. The pottery was then fired. The process was often elaborated by Maya artists to achieve special decorative effects. The process appears to have been a response to changes in taste and styles of decoration. The related Usulutan process may be ancestral to the Late Classic one. (26)

Spaulsind, James (see Schneider, Kent A.)

Spielbauer, Ronald H. (Miami University) ABORIGINAL CHERT UTILIZATION IN UNION COUNTY, ILLINOIS. Early archaeological investigations in Union County, Illinois emphasized the presence of aboriginal quarries for Mill Creek Chert. Recent work in settlement pattern studies for the area has led back to the study of chert resources since the Union County area contains at least 2 other frequently used chert types. Information on identification, acquisition, and modification of these cherts will be presented. (17)

Stephens, S. G. (North Carolina State University, Raleigh) PROBABLE CENTERS OF DOMESTICATION OF COTTON IN THE AMERICAS. Recent geographical and morphological studies of primitive cotton cultivars in the Americas suggests that they may be classified in 4 broad groupings: Group I, *Gossypium barbadense*—Ecuadorian type; Group II, *Gossypium barbadense*—Brazilian type; Group III, *Gossypium hirsutum* var *marie galante*—Caribbean type; Group IV, all other races of *G. hirsutum*—Central American types. There is very little evidence of morphological transition, or of geographical overlap between these groups. Group I occurs in the same general area as wild forms of *G. barbadense*, and recent studies of archaeological cottons (ca. 2500 B.C.) in the Ancon area of central Peru seem to bridge the gap between wild and cultivated forms (Stephens and Moseley, unpublished). This suggests a primary center of domestication in the coastal regions of Ecuador or Peru. No wild forms of *barbadense* have been found east of the Andes and the lack of geographical or morphological overlap between Group I and Group II cultivars may indicate that the 2 groups were domesticated independently, west and east of the Andes, respectively. Group III seems to have its most primitive types located in northwestern Colombia and to have radiated outwards in 4 different directions: southward along (a) the Cauca and (b) the Magdalena Valleys, (c) northward through the Pacific coastal plains of Central America, and (d) westward through Venezuela into the Antilles. Group IV is a morphologically heterogeneous group, confined mainly to southern Mexico, Guatemala, and the eastern parts of British Honduras and the Yucatan. There is overlap between Groups III and IV in Cuba and Hispaniola. The wide distribution of wild forms of *hirsutum* around the Caribbean and on the Pacific islands gives no clue as to the origin of domestication in this species. The oldest recorded archaeological cotton in the Tehuacan Valley of Mexico (ca. 3500 B.C.) seems to have been already well established in domestication (Smith and Stephens 1971). Pending further archaeological evidence, early and separate domestications of Group III and Group IV cottons seems, for the present, to be the most likely interpretation. (8)

Stickel, E. Gary, and Jonathon E. Ericson (University of California, Los Angeles) A PROPOSED CLASSIFICATION SYSTEM FOR CERAMICS. A classification system, based on solid geometrical description of vessel morphology, is proposed which will permit the standardization of ceramic data. An experiment was conducted to test the reliability of the proposed system which had favorable results. A systematic relationship between the actual total weight and volume of the tested ceramics is presented, which may allow researchers to estimate the total ceramic capacity of archaeological sites. (17)

Stoltman, James B. (University of Wisconsin) MCKINSTRY MOUND 1 REVISITED... This paper reports the results of excavations into the undisturbed northern face of McKinstry Mound 1 during the summer of 1970. The mound had been constructed in 3 separate stages. Analysis of the contents of these mound stages provides the first firm evidence that much of the previously recognized within-Laurel cultural variability is attributable to time. Five radiocarbon dates are the first for this Middle Woodland phase in Minnesota. (9)

Strachan, Richard A. (Mankato State College), and Timothy C. Klinger (Wayne State University) A STATISTICAL APPROACH TO THE CLASSIFICATION OF PROJECTILE POINTS. Classification of projectile points has been of constant concern to most archaeologists. The variations of types and within types is so diverse and general that often description and visual classification becomes a process producing only obscure, conflicting and, incomprehensible data. It is suggested here that the usage of profile analysis in creating statistical coefficients of shape similarity may both eliminate the inherent problems in visual classification and, elucidate the often complex relationships between and within "established" types. (23)

Strother, Karen E. (Yale University) A METHOD FOR THE TECHNOLOGICAL ANALYSIS OF UNSPECIALIZED LITHIC INDUSTRIES. A technological study of unspecialized lithic assemblages from 6 cultural phases (including one preceramic phase) of coastal Ecuador demonstrates that production behaviors can be reconstructed from the detailed analysis of primary flaking debris and unspecialized cores. (23)

Stuart, George (National Geographic Society and George Washington University) THE ARCHAEOLOGICAL SITUATION IN THE MIDDLE WATeree VALLEY, SOUTH CAROLINA. Surface collection and some excavation between 1948 and 1953 in the Wateree Valley south of Camden, South Carolina, indicate a chronological range of occupation from the Paleo-Indian horizon into Colonial times. Unusual ceramic material from one site suggests an occupational span that may relate to the Woodland period. Possible relationships of this site to others nearby—including preceramic as well as temple mound manifestations—are discussed, along with evidence related specifically to Middle Woodland times in the region. (15)

Sutherland, Donald (University of South Carolina) SURVEY AND EXCAVATION OF HABITATION SITES IN THE DEPARTMENT OF SANTANDER, COLOMBIA, JULY AND AUGUST, 1970. This paper presents for the first time the most recent data available on habitation sites in the southeastern portion of the Department of Santander, Colombia. The data indicates the presence of larger settlements in the "Guane" area than formerly believed and suggest a careful selection of ecological circumstances for their placement. Pottery from the sites is identical to some found in dated shaft and side-chamber burials in the region and can to some extent be correlated with a still continuing, local ceramic tradition. (25)

Suzuki, Kimio (Keio University, Japan) JAPANESE ARCHAEOLOGY: A HISTORICAL SKETCH. Several introductory syntheses of Japanese prehistory have been written by Western authors but they have mentioned very little about the methodological trends of Japanese archaeology. The writer therefore will present a brief outline of the development of Japanese archaeology, divided into 4 successive periods by its major developments in method and theory. This will provide comparative knowledge of the nature and characteristics of Japanese archaeological research. (8)

Symes, Martha I. (Colorado State University) A METHODOLOGICAL ANALYSIS OF OBSIDIAN WORKSHOPS IN THE NOCHIxtlan VALLEY, OAXACA. During July, 1971, collections were made on 3 obsidian workshops in the Nochixtlan Valley of Oaxaca, Mexico. The 3 populations were collected in different ways: one was a random pickup over the entire workshop area, the second was a controlled pickup over the surface of the area, and the third was an excavation of a 2 x 2 meter square within a workshop. (17)

Tamplin, Morgan J. (University of Arizona) CLUSTER ANALYSIS OF LITHIC ASSEMBLAGES USING THE BC TRY SYSTEM. Type frequency counts of Upper Paleolithic assemblages, particularly the Solutrean, were submitted to the BC TRY system of programs for key cluster analysis. The resulting inter-associations of artifact types and assemblages is comparable to the commonly recognized Paleolithic subdivisions. Previously unrecognized clusters are discussed in terms of attribute vs. fixed-type studies, and functional vs. cultural associations. (5)

Tartaglia, Louis James (University of California, Los Angeles) THE RECONSTRUCTION OF CERAMIC TECHNOLOGY BY X-RAY PHOTOGRAPHIC ANALYSIS. There are many problems involved in the detailed reconstruction of ceramic technology. For example, traces on pots which are indicative of a specific technique used in the manufacture of ancient Peruvian Moche stirrup spouted vessels are removed in the final process of vessel construction. Such complex situations make it difficult to evaluate alternative theories which have been proposed concerning the construction of Moche pottery. A number of Moche stirrup spouted vessels were subjected to X-ray analysis in an attempt to resolve the specific problems of reconstruction. The results revealed remains of the fabrication process which appears to confirm Donnan's theory on the ceramic technology of Moche stirrup spouted vessels. In addition, the analysis identified certain characteristics which may be reflective of different distinguishable workshops. (17)

Taylor, R. E. (University of California, Riverside) ADVANCES IN AMINO ACID DATING. At the present time, the study of early episodes in the evolution of the hominids is significantly hampered by the inability of operational chronometric methods to provide temporal placement for fossil material older than the effective limit of the radiocarbon method. Although other geochronological methods can be used to provide vital chronological data up to now they generally have been able to provide data only on associated geological contexts rather than directly to the fossil material itself. Through the use of differential rates of thermal decomposition and racemization for a wide spectrum of amino acids, chronometric placement for fossil material throughout most of the Cenozoic may be possible. A report on amino acid determinations on Pleistocene materials will emphasize the analytical problems involved as well as sample contamination effects. (17)

Thomas, David H. (City College of the City University of New York) CHI-SQUARE IN THE DESERT? The Reese River Ecological Project has conducted summer field courses for the

past 3 years through the Universities of Nevada (Reno) and California (Davis). Since the research design called for intensive surface collection of randomly selected 500-meter tracts, some rather unusual field conditions prevailed. After some degree of experimentation, a fair balance was finally attained between formal lecture sessions, applied scientific and statistical notions, and pure physical labor. (20)

Thomas, David H. (City College of the City University of New York), Leonard Williams (University of California, Davis), and Robert Bettinger (University of California, Riverside) NOTIONS TO NUMBERS: GREAT BASIN SETTLEMENT PATTERNS AS POLYTHETIC SETS. This paper deals with 2 theoretical issues which confront modern American archaeology: proper testing of hypotheses and operationalizing intuitive concepts. Based upon earlier computer simulation (the Basin I model) and extensive fieldwork in the Reese River area of central Nevada, the authors framed a series of hypotheses regarding winter village placement: given the proper set of environmental conditions, we felt that we could successfully predict presence/absence of archaeological sites—a hypothesis which requires testing upon independent data. But to conduct the requisite fieldwork, the relevant ecological variables were first defined into measurable quantities and then these rather diverse criteria were welded into a single polythetic definition. In this manner, whenever at least 5 of the 7 quantitative propositions were satisfied in nature, a site was predicted to occur. Subsequent fieldwork indicated that the polythetic predictors were accurate approximately 95% of the time in this area. (4)

Thomas, George B. (Summit, New Jersey) MEASURING THE POT-HUNTER FACTOR: UNCONTROLLED, SELECTIVE TREASURE-HUNTING AND CONTROLLED SURFACE COLLECTION NEAR MITLA, OAXACA. Missionaries loaned to archaeologists their collections of obsidian from the surface of an obsidian "workshop" site near Mitla, Oaxaca, Mexico. Comparative studies of these collections and of controlled collections of obsidian, non-obsidian lithic, and ceramic artifacts provided a clearly demonstrable index of site destruction by selective surface collection of most of the larger pieces of obsidian. Areal distribution and numerical representation were distorted, although possibly valid, workable results were obtained pertaining to the non-obsidian artifacts. The value of this study as an educational demonstration is discussed, within the framework of an applied anthropological approach to the problems of pot-hunting, looting, and modern behavioral patterns of construction and expansion. (26)

Thompson, Donald E. (University of Wisconsin) SITES IN THE PUNA BORDERING THE UPPER MARANON IN NORTHERN PERU. This paper is based upon a survey carried out between August and December, 1970, on the Upper Maranon between Ancash and La Libertad and on excavations carried out between June and August, 1971, in a series of sites in the zone of Uchucmarca, a town east of the Maranon in the Department of La Libertad in Northern Peru. Most of the sites discussed appear to be Inca and immediately pre-Inca in date, though some may have been occupied continuously since the Middle Horizon or earlier. The sites tend to be located in saddles or on ridges in puna country or just below. Architecture varies somewhat, but there are certain construction details and structure types that are common to most sites. Ceramics consist mostly of plainwares, and rim shapes provide the most useful traits for study. Finally, there are indications that the population in parts of this zone was considerably greater in the past than it is today and that the inhabitants of these high altitude sites in the eastern ranges of the Andes were involved in trade or some other kind of network which stretched from the Pacific coast to the Selva Alta. (12)

Thompson, Raymond H. (University of Arizona) THE UNIVERSITY OF ARIZONA ARCHAEOLOGICAL FIELD SCHOOL. The concept of the archaeological field school as a combination research and training operation. The history and development of the concept in the Southwest and the field school tradition at the University of Arizona in particular. The relationship of both the training program and the research effort at Grasshopper to this tradition. (1)

Thurman, Melburn D. (University of Maryland) NEW EXCAVATIONS AT THE ACCOKEEK CREEK SITE, MARYLAND. Robert L. Stephenson, in his report on the excavations of Alice L. L. Ferguson, stated that "the Accokeek Creek site has been so thoroughly excavated as to nearly exhaust the possibilities for collecting additional data or materials." Nevertheless, as a result of the 1971 excavations in the "Mayaone" area, which concentrated on postmold typology, portions of rectangular houses with oval ends were defined. These houses were of the kind described for the Piscataway Indians. (9)

Toth, Alan (Louisiana State University) THE MARKSVILLE PERIOD IN THE LOWER MISSISSIPPI VALLEY. Hopewellian connections in the mortuary pottery at the Marksville site were recognized as early as 1933. Subsequent WPA archaeology explored the relationship further, but reports on the finding are very few. A recent reexamination of ceramics from Marksville suggests a more complicated occupation of the site than previously suspected. A number of new Marksville sites, including village sites, have been located to expand the picture of Middle Woodland in the lower Mississippi Valley. Initial ceramic influence, which can be traced to the Illinois Valley, was followed by local development and elaboration of the basic decorative treatments. A review of current knowledge and research objectives concerning the Marksville period is presented. (15)

Tringham, Ruth (Harvard University) THE AIMS OF FUNCTIONAL ANALYSIS OF ARTIFACTS. Microwear studies and identification of the use of artifacts, specifically stone and bone artifacts, may be applied to the wider framework of analyses of artifacts in prehistoric (or ethnographic) assemblages. Microwear studies, with the support of systematic experimental testing, are essential in the recognition of change in cultural systems. Without such a check on the function or use of the artifact, it is impossible to evaluate the relative effect of the limitations, imposed either by raw material and level of technological skill or by the minimal morphological requirements of a particular function, in determining the shape of an artifact. Only when the effect of these variables has been determined, is it at all possible to recognize those morphological features which are the result of socio-cultural factors, i.e., the choice of preferred shape within the range of possible shapes offered by the combined factors of raw material, technology, and function. (7)

Turner, Christy G., II, and Jacqueline A. Turner (Arizona State University) ALEUT ARCHAEOLOGY, BIOLOGY, AND DEMOGRAPHY. Two sites on Akun and Islelo Is., eastern Aleutians, Alaska, were studied in June-July, 1971. On Akun, Chulka is the pre- and historic ancestral village of some living Akutan Aleuts. Chulka bone and stone tools show differences with Aleut Chaluka to the west and Eskimo Port Moller and Uyak to the east. Imported ground stone tools were used throughout the 3 m of occupation. Islelo has an eroding cliff-face remnant of 10 cm thick band of charcoal, Chulka-like bifacial points and flakes, but discordantly 75 cm beneath undisturbed peat. C-14 dates are being processed by R. Stuckenrath. Historic contact triggered a near total abandonment of most stone-tool types, bone flakers, and cheap stone resources. Expensive metal tools (and guns) were substituted, probably at important ecological costs and disturbances since historic sea mammal remains show a greater frequency (36.8%) of mature seals and sea lions than prehistorically (21.2%). Most bone tool frequencies remained unchanged, but cut-and-incised bird bones, needles, awls, pins, and fish hooks decreased as expected. An increase in worked and cut whale bone and the introduction of steambathing suggests wasteful use of precious bone and driftwood resources. Physically, the caries-free prehistoric Neo-Aleuts with their 3-rooted lower first molar-bearing broad jaws contrast markedly with living Akutan Aleuts who show among other differences a high caries rate, an increase in malocclusion, and a narrowing of the face and jaws. Genetic changes are significant. These and other data show (1) the importance of developing techniques for better utilizing archaeologically-derived temporally-expanded data as directly comparable baselines for local evolutionary investigations, and (2) that the deleterious effect of contact as known by Aleut population loss from 16,000 to 1000 plus or minus shows up even archaeologically in reduced cultural-environmental register, and in the acquisition of non-adaptive behavior in the wet cold pelagic Aleutian biome. (19)

Turner, Jacqueline A. (see Turner, Christy G., II)

Van Asdall, Willard (University of Arizona) ARCHAEOLOGY AND ECOLOGY: BEWARE OF THE PROBLEMS. Archaeologists recognize the value of incorporating ecological approaches, techniques, methods, and perspectives into their teaching and research. What they may not recognize or fully appreciate is that regardless of the approach used or the level of ecological involvement, pitfalls, and problems are likely to occur. Several such problems will be identified and discussed. Specific examples will be presented and considered. Recommendations of how to avoid or cope with such problems will be given. (1)

Varner, Dudley (see Blanton, Richard E.)

Veltre, Douglas W. (University of Connecticut) AN ANALYSIS OF ANANGULA BLADE TOOLS. In an attempt to establish a procedure for delineating artifact groups having behavioral significance, 2 hypotheses are formulated: (1) both manufacture and use of stone tools are reflected in certain measurable attributes of those tools; (2) the spatial patterning of artifacts within a site reflects behavioral patterning of their users. To test these hypotheses, blade artifacts from the site of Anangula, an island in the Aleutian chain, are examined. Attribute groupings are created through the use of computer cluster analysis, and the resulting clusters are analyzed with respect to their spatial significance. (19)

Vogeler, Ingolf (University of Minnesota) THE CULTURAL ECOLOGICAL SETTING OF SOUTHEASTERN CAMPECHE. A study of the cultural ecology of southeastern Campeche, Mexico has raised some important questions about the reliability of this field data for archaeological interpretation of the Rio Bee region. This frontier area with its low population densities, recent settlers and settlements, and incomplete development of the agricultural system presents particular difficulties. An analysis of shifting cultivation and food consumption was made to determine the carrying capacity of the area. The concept of carrying capacity, itself, presents a number of problems. (3)

Waller, Ben (Ocala, Florida) PALEO-INDIAN RIVER AND STREAM KILL SITES IN FLORIDA. Discussions in the report concern Paleo-Indians of Florida. It is maintained that some rivers and streams may have served as kill-sites for Paleo-Indians. (24)

Walther, John A. (University of North Carolina and Mound State Monument) COPENA: SUBSISTENCE AND SETTLEMENT, A PRELIMINARY REPORT. For many decades one

of the major problems in Southeastern Woodland studies has been the origin and development of the Copena culture of northern Alabama. Twenty burial mounds belonging to this complex have been excavated and the results published, only the Wright village in Lauderdale county, Alabama, has been reported. In 1940, during the final phase of the WPA excavations in northern Alabama, an intensive investigation was undertaken to locate and excavate more Copena habitation sites. This paper presents the preliminary results of recent laboratory analysis and reevaluation of this material. Four village sites with Middle Woodland components are discussed and compared with the Wright village material. (15)

Watson, Patty Jo (Washington University) ARCHAEOLOGY OF THE MAMMOTH CAVE AREA. Description and explanation of aboriginal use patterns in Salts Cave (Mammoth Cave National Park), excavations inside the cave, and analysis of prehistoric cultural debris found there began in 1963. The Salts Cave Archeological Project has expanded its activities to other caves in the Park—including Mammoth Cave itself—and has made a brief reconnaissance of Wyandotte Cave in southern Indiana. Radiocarbon dates have been obtained for prehistoric material in several of these other caves. Excavations have also been undertaken in Salts Cave Vestibule, and although stone and bone artifacts are few, charred plant remains, and fragments of human and animal bones are relatively abundant. Several radiocarbon dates have been obtained for the culture bearing layers, and seem to indicate a time range for the Vestibule occupation from mid-second millennium B.C. to early first millennium B.C. So far it appears that the lower levels contain sunflower, Chenopodium, Iva, and other native North American species but neither squash nor gourd, both of which occur in the upper levels and in the cave interior. (9)

Webster, Dave (University of Minnesota) FORTIFICATIONS AT BECAN AND MAYA MILITARISM. In 1934 Ruppert and Denison discovered the fortified Lowland Maya site of Becan, in southeastern Campeche. These fortifications were investigated during the 1970 season of the Becan Project (National Geographic Society). They consist of a huge dry-ditch and parapet system 1.2 miles in length surrounding an impressive center covering an area of some 50 acres. An intensive program of test-pitting and structural excavation has enabled us to reconstruct the original configuration of the defensive system and date its construction to the Early Classic Chacsik Phase (Tzakol 1-2, ca. A.D. 350-450). In terms of size, defensibility, and labor-input the fortifications dwarf all other known Lowland defenses, with the exception of the earthworks recently discovered at Tikal, and are presently the oldest fortifications yet found in Mesoamerica. They were built in response to Teotihuacan influences in the Peten, which seem to have caused serious political imbalances in the Lowlands. The existence of large-scale fortifications in the Lowlands in the fourth to fifth centuries A.D. indicates that warfare may have been an important factor in Maya cultural development throughout the entire Classic period. (3)

Weed, Carol S. (Arizona State Museum) CLASSIC PERIOD HOHOKAM LITHIC ASSEMBLAGES. Little work has previously been done with Classic Hohokam chipped and ground stone assemblages, primarily because of a scarcity of excavated sites. Haury's 1945 Los Muertos report lists specific artifactual types, usually considered indicative of Salado influence, as diagnostic of Classic lithics. However, a complete analysis of the stone recovered from the excavation at Las Colinas (Hammack, Kiva, vol. 31, no. 1), a large Classic site with a well-defined Salado ceramic element, failed to reveal any previously accepted diagnostic types and instead exhibited a remarkable degree of traditionalism. (23)

Weigand, Phil C. (State University of New York, Stony Brook), and Garman Harbottle (Brookhaven National Laboratory) TURQUOISE SOURCES AND SOURCE ANALYSIS: MESOAMERICA AND THE SOUTHWESTERN U.S.A. This paper presents the preliminary results of short and long neutron bombardment of turquoise source samples from various localities in Jalisco, Zacatecas, and New Mexico. The resultant source "fingerprints" are compared to those of turquoise artifacts. The implications of this project toward quantifying the patterns of long-distance trade and contacts between and within Mesoamerica and the Southwest are discussed. (22)

Wells, James (see Rose, Jerome)

White, Marian E. (State University of New York, Buffalo) AN ARCHAEOLOGICAL FIELD SCHOOL IN NEW YORK STATE. This field school is one which accepts both experienced and inexperienced students, 15-20 in number, for 6 weeks of formal and informal instruction. A temporary field camp serves as the base of operations somewhere in upstate New York State. This kind of field school arises from faculty and student viewpoints on the interplay between teaching and research accomplishments in a field situation. Given the one described here, certain practical guidelines follow. Proportions of formal vs. informal teaching and of experienced vs. inexperienced personnel, budget, and living arrangements will be discussed. Public relations, including those with the community, amateurs, Indians, and public media will be examined. (20)

Wilcox, David R. (University of Arizona), Michael B. Collins (University of Kentucky), and J. Jefferson Reid (University of Arizona) SAMPLING PUEBLOS: THE IMPLICATIONS OF ROOM SET ADDITIONS AT GRASSHOPPER. An analysis of room corners in three large room blocks at Grasshopper, a late Mogollon pueblo in east central Arizona, has resulted in the perception of a tentative sequence of room set additions called construction units. The

implications of these units for further sampling, for understanding pueblo growth and ultimately for the perception of social groups and their relations will be discussed. (1)

Wilkerson, S. Jeffrey K. (Harvard University) AN ARCHAEOLOGICAL SEQUENCE FROM SANTA LUISA, VERACRUZ, MEXICO. Excavations during 1968, 1969, and 1970 in the Tecolutla drainage on the Gulf Coast of Veracruz have produced a nearly complete chronology from the Middle Formative through European contact. A limited occupation of earlier date, possibly preceramic, is also present. The chronology helps to close a geographical gap between the northern Huasteca and south-central Veracruz, thereby allowing a more precise understanding of culture contact in the area. (14)

Williams, Kenneth (University of Wisconsin, Milwaukee) EAST LOBES OF MONKS MOUND. The east lobes of Monks Mound were excavated during 1971 in an attempt to discover their aboriginal function and to investigate the method of their construction. In the process of excavation a stratigraphic sequence was discovered which spans at least 600 years of nearly continuous occupation. Future work will do much to clarify chronological problems at the site. It was also our good fortune to find, in good context, one of the few instances of "southern cult" material to be discovered at Cahokia. (10)

Williams, Leonard (see Thomas, David H.)

Wing, Elizabeth S. (Florida State Museum) PRELIMINARY REPORT ON THE PREHISTORIC USE OF ANIMAL RESOURCES IN THE PERUVIAN ANDES. Faunal materials excavated from several sites in the Peruvian Andes reflect the use of animal resources by prehistoric people living in this environment. Although this study is in its preliminary stages certain patterns of animal utilization are beginning to emerge. Our data indicate prehistoric dependence on three groups of animals, deer, camelids, and guinea pig, an early domestication of guinea pig, and later domestication of the llama and alpaca. (22)

Yarborough, Michael A. (University of Arkansas) ANALYSIS OF POTTERY FROM THE WESTERN ALASKA PENINSULA. Sherds found in sites within the Izembek National Wildlife Refuge near Cold Bay represent the most westerly example of pottery known on the Alaska Peninsula. This gravel tempered pottery is dated to A.D. 1050 and is part of a larger pottery tradition known most closely from Chirikof Island, Kodiak Island and the Naknek-Katmai region. Other artifact classes of the Izembek Phase support the hypothesis of northeastern affinity. The tip of the Peninsula is considered to be the approximate southwestern end of pottery distribution as no sherds are currently known from the nearby Aleutian archipelago. (19)

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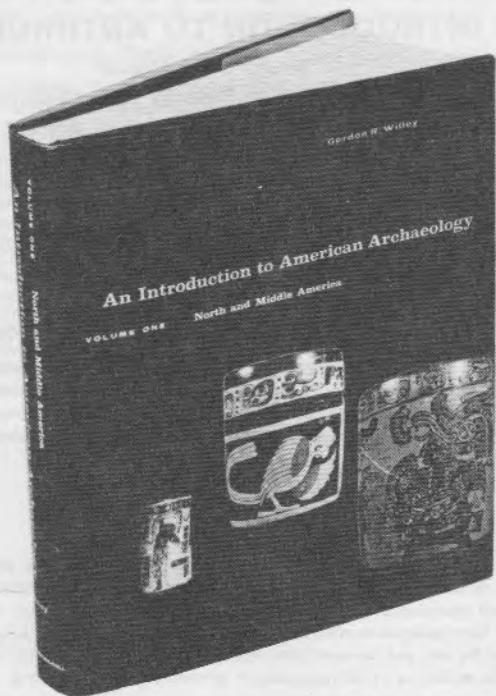
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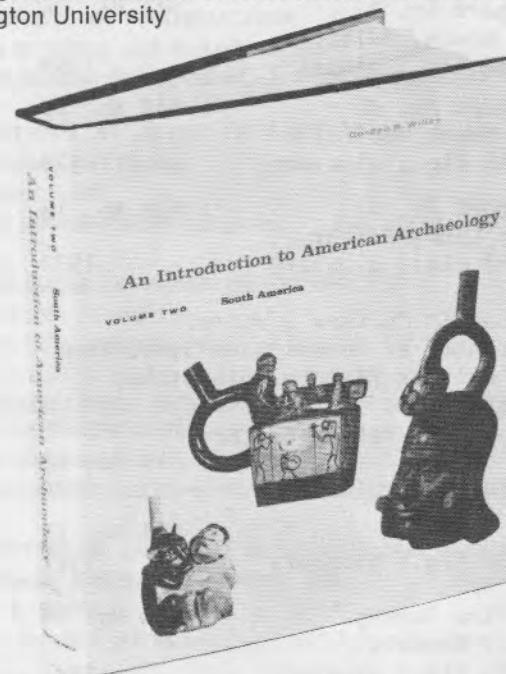
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