Program and Abstracts

Society for American Archaeology

FORTY-THIRD ANNUAL MEETING

Tucson, Arizona 4-6 May 1978
GENERAL INFORMATION

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

Business Meeting The Society’s annual business meeting will begin at 5:45 pm in the Community Center Music Hall.

Convention Office Any problems or special requests during the meeting should be reported to the Pima Room.

Exhibits Publishers’ book exhibits will be displayed in the Cochise Room from 4 pm to 8 pm on Wednesday, 9 am to 5 pm Thursday and Friday, and 9 am to noon on Saturday.

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

Message Center A self-service message center will be located in the registration area. This center should not be used for messages pertaining to the placement service.

National Endowment for the Humanities representatives—Glenn Long of the Museums and Historical Organizations Program and staff members from the Endowment’s Division of Public Programs—will be present at the annual meeting to discuss historic site interpretation and museum programs with interested archaeologists. Times and places of their availability for consultation will be posted on the message board.

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

Open House Everyone is invited to the open reception (cash bar) on Thursday at 6 pm in the concourse lobby.

Placement Service A placement service will be conducted in the Chihuahua Room which is located in the lower lobby of the Marriott Hotel from 9 am to 5 pm on Thursday, Friday and Saturday. Positions open or wanted may be listed with the service throughout the meeting. Message forms will be provided and box numbers will be assigned for use in the placement service message center.

Registration Registration, which includes a copy of the Program and Abstracts, is required for attendance at all sessions. Registration desks will be open in the concourse lobby from 4 pm to 8 pm on Wednesday, 8 am to 4 pm on Thursday and Friday, and 8 am to noon on Saturday. Members who pre-registered by April 17 should claim their programs and badges at the advance registration desk.

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

Floor plans of the exhibition hall meeting rooms and of the community center appear on the next pages.
The MANAGEMENT of ARCHEOLOGICAL RESOURCES

THE AIRLIE HOUSE REPORT

edited by Charles R. McGimsey III and Hester A. Davis

A Consideration of Law in Archeology
Cultural Resource Management
Guidelines for the Preparation and Evaluation of Archeological Reports
The Crisis in Communication
Archeology and Native Americans
Certification and Accreditation

A special publication of the Society for American Archaeology, available from SAA Publications, 1703 New Hampshire Av NW, Washington, DC 20009. $3.00 per copy, prepaid.

PROGRAM

THURSDAY MORNING, MAY 4

(1) Symposium: CHANGE AND INTERACTION IN THE HOHOKAM CORE AREA Mohave
Organizer and Chairperson: Fred Plog
Participants:
9:00 Fred Plog, The Nature of Hohokam Cultural Change
9:20 David E. Doyel, Hohokam Social Organization and the Sedentary to Classic Transition
9:40 Carroll L. Riley, The Impact of Mesoamerican Interaction on Hohokam Culture Change
10:00 Discussants: J. Charles Kelley, Martin E. McAllister
10:30 Robert E. Gasser, Exchange in Hohokam Subsistence Practices
10:50 Steadman Upham and Glen Rice, Up the Canal Without a Pattern: Modelling Hohokam Interaction and Exchange
11:10 Discussants: Stephen Plog, Emil Haury
11:45 Discussion

(2) Symposium: FRONTIER SYSTEMS AND BOUNDARY PROCESSES: AN APPROACH TO IN-TER-REGIONAL ANALYSIS Maricopa
Organizers and Chairpersons: Stanton W. Green and Stephen M. Periman
Participants:
9:00 Stanton W. Green and Stephen M. Periman, Introduction
9:15 Steven E. Hampson and John S. Justeson, Closed Models of Open Systems
9:55 Stephen M. Periman, The Effect of Coastal Processes on Coastal and Inland Settlement
10:35 Kenneth E. Lewis, Settlement Pattern and Functional Variation of the South Carolina Frontier
10:55 Robert W. Paynter, Spatial Responses to Long Distance Processes: Models and Assumptions
11:15 Discussants: Michael B. Schiffer, H. Martin Wobst

(3) Symposium: SOCIAL USES OF MAYA BIOTA

Greenlee
Organizer and Chairperson: Mary Pohl
Participants:
8:00 Stanley J. Olsen, Special Problems of Fossil Analysis in the Maya Area
8:25 Nancy L. Hamblin and Rea Amadeo, Isla Cozumel Archaeological Avifauna
8:50 Elizabeth S. Wing, Maya Foodways
9:15 Mary Pohl, Fauna as an Indicator of Differential Social Status Among the Ancient Maya
9:40 Hattula Moholy-Nagy, The Uses of Mollusks at Tikal, Guatemala
10:05 Frank P. Saul and Julie Mather Saul, Maya Socioculture and Ecology as Recorded in Their Skeletons
10:30 Arthur W. Vokes, They Don’t Make Them Like They Used To
10:55 Howard Savage, Faunal Findings in Cave Sites in Belize
11:20 Linda Schie, The Plants and Animals on the Sarcophagus Sides at Palenque
11:45 Discussant: B. M. Gilbert

(4) Symposium: DIAGNOSTICS OF THE MIDDLE HORIZON IN PERUVIAN ARCHEOLOGY

Graham
Organizers and Chairpersons: Richard P. Schaeder and James M. Vreeland
Participants:
8:30 Richard P. Schaeder, Permanent and Transitory Diagnostics of the Middle Horizon in the Central Andes
8:50 Discussion
9:30 James M. Vreeland, The Moche-Huari Cultural Interface: Textile Technology and Iconography of a Sill Tapesty Funerary Garment
9:40 Discussion
9:50 William J. Conklin, Middle Horizon Textile Techniques
10:00 Izumi Shimada, Causality of Changes During the Middle Horizon: A North Coastal Perspective
10:20 Discussion
10:30 Carol J. Mackey, A Re-evaluation of the North Coast Huari Style
10:50 Discussion
11:00 Jack Smith, Jr., Recency Iconography and Middle Horizon Styles
11:20 Discussion
11:30 William H. Isbell, Huari Urban Configurations
11:50 Discussion
12:00 Katharina J. Schreiber, Planned Architectural Units of the Middle Horizon: Variations on a Theme
12:20 Discussion

(5) Symposium: CURRENT THEORY AND RESEARCH IN GREAT BASIN ARCHAEOLOGY
Gila Organizers and Chairpersons: D. D. Fowler and Robert L. Bettinger

(6) General Session: METHOD AND THEORY
Coconino
Chairperson: Daniel Wolfman

(7) Symposium: URBAN HISTORICAL ARCHAEOLOGY IN THE UNITED STATES
Apache Organizers and Chairpersons: Roy S. Dickens, Jr. and William R. Bowen
Participants:
9:00 Frederick J. E. Gorman, The Changing Economy of the Eighteenth-Century Glass Manufacturing Community: Implications for Urban Historical Archaeology
9:40 Bert Salwen, Archaeology in Megalopolis: Updated Edition

(8) Symposium: REGIONAL DIVERSITY ON THE HOHOKAM PERIPHERY
Mohave
Organizer and Chairperson: David E. Doyel
Participants:
2:00 George J. Gumerman, The Hohokam of the Northern Periphery
2:20 Donald E. Weaver, Jr., The Northern Frontier, Hohokam Regional Diversity as Seen from the Lower Salt River Valley
2:40 Peter J. Pilled, Jr. and Paul R. Fish, Colonies, Traders, and Trade: The Hohokam in the North

(9) Symposium: RECONSTRUCTION OF SOCIAL ORGANIZATION IN NORTHERN PERU
Maricopa
Organizers and Chairpersons: Margaret A. Hoyt, Alexandra M. Ulana Klymyshyn
Participants:
2:00 Garth Badewin, The Social Context of Moche V Ceramics
2:20 Melody Shimada and Izumi Shimada, Generative Aspects of Socioeconomic Stresses
2:40 Donald E. Thompson, Structure-Function in Pre-Columbian Villages in the Peruvian Highlands
3:00 Margaret A. Hoyt, Chimu Status Differentiation as Reflected in the Ceramics
3:20 Patricia J. Netherly, Archaeological Implications of Social Organization in the North Coast of Peru
3:40 Alexandra M. Ulana Klymyshyn, Social Organization in an Imperial Capital
4:00 John J. Wilcox, An Incaic Period in Pre-Incaic Peru
4:20 Discussion

(10) Symposium: MAYA ECOLOGY AND AGRICULTURE FROM THE PERSPECTIVE OF THE NATURAL SCIENCES
Greenlee
Organizer and Chairperson: Frederick M. Wiseman
Coconino
Organizers: Francis P. McManamon and David J. Ives
Chairperson: Francis P. McManamon

Participants:
2:00 Francis P. McManamon, Discovering Non-Structural Sites in the Eastern United States: Past and Future Directions
2:20 Dena F. Dincacue, Predicting Relative Site Densities: Two Techniques for Landscape Analysis
2:40 John J. Knoett, Data Resolution in Measuring Site Location in Heavily Vegetated Areas: Methodology and Techniques
3:00 Laurel Casinelli, Approaches to Site Discovery
3:20 David R. Evans and David J. Ives, Locating Sites in East-Central Missouri: Problems and Solutions
3:40 Peter Thorbahn, Site Survey in New England: A Field Experiment in Sampling Theory and Method
4:00 Joan M. Gero and Dolores Rook, Data Retrieval from Stored Memories
4:20 Mark Brooks and Stanton W. Green, A Strategy for Determining the Extent and Variability of Archaeological Sites in Temperate Forest Localities
4:40 Glen Hanson, Richard Taylor, and Marion Smith, The Russell Archaeological Project: A Survey of Forested Lands in the South Appalachian Piedmont
5:00 Albert A. Dekin, Spatial Theory and the Effectiveness of Site Examination in the Northeast
5:20 Discussant: Stuart Struever

(14) Symposium: THE ANTHROPOLOGY OF EARLY HAWAII
Apache
Organizers and Chairpersons: P. Blon Griffin and Robert J. Hommon
Participants:
2:00 Patrick V. Kirch, Ecological Perspectives on Prehistoric Hawaiian Marine Exploitation
2:20 Michael W. Kees, Hawaiian Social Unit Boundaries as Artifacts
2:40 Paul Rosendahl, The Impact of Early Hawaiians on Their Island Environment
3:00 Edmund J. Ladd, Hawaii Island Dryland Agriculture
3:40 Patricia Price-Beggarly, Pre-Agricultural Hawaii: A Possible Model
4:00 Thomas J. Riley, The Peoples of Hawaii
5:00 P. Blon Griffin, Technology and the Hawaiian Adaptive System
5:20 Hallett H. Hammatt, Geoarchaeological Stratigraphy in the Hawaiian Islands: Some Propositions and Preliminary Results

(13) Symposium: NON-STRUCTURAL SITE DISCOVERY IN HEAVILY VEGETATED AREAS: METHODOLOGIES AND TECHNIQUES
Maricopa
Chairperson: Mark S. Aldenderfer

Participants:
2:00 Deward Walker and James J. Hester, Use and Abuse of Ethnographers in Cultural Resource Management
2:25 Howard M. Davidson and Deborah Westfall, An Example of Multi-Stage Research Within a Cultural Resource Management Framework
2:50 Joseph G. Gallagher, Scarification and Cultural Resources: An Experiment to Evaluate a Timber Management Technique
4:05 J. Jefferson Reid, To Soothe the Salvage Beast
4:30 Bruce Anderson, The Antiquities Act in the 10th Circuit Court: Failure to Prosecute Due to Vagueness
4:55 Charles M. McKinney, Recent Antiquity Legislation Initiatives
5:20 Discussion

Thursday evening, May 4

(15) General Session: QUANTITATIVE METHODS
Maricopa
Chairperson: Mark S. Aldenderfer

Participants:
2:00 Edward S. Deere, Don S. Rice, and Mark Brenner, Classic Maya Impact on a Lacustrine Environment
3:00 Robert B. Waide, The Effect of Slash-and-Burn Agriculture on the Anfoula of Southern Campeche
3:25 Suzanne K. Fish, Palynology of Edzna and Aquacalaf: Environment and Economy
4:40 Alfred H. Siemens, Maya Raised Fields in a Broadened Context
5:15 Frederick M. Wiseman, The Terminal Classic Malize Episode
5:45 Discussants: T. Patrick Culbert, Edward S. Deere

(11) General Session: NORTH AMERICAN ARCHAEOLOGY
Graham
Chairperson: Ruthann Knudson
Participants:
2:00 Robert F. Maslowski, Moorehead Cave Corridor Analysis: Its Cultural and Technological Implications
2:15 Rain Venik, Archaeological Survey Along the Sheyenne River, Eastern North Dakota: A Preliminary Report
2:30 Janet Friedman and Floyd Sharrock, Prehistory in Hills Canyon National Recreation Area
2:45 Richard M. Pettitgrew, The Prehistoric Cheyennesians: Lake Dwellers of Lake Abert, Southeastern Oregon
3:00 Joanne M. Mack, A Ceramic Tradition from the Siskiyous Mountains of Southwestern Oregon
3:15 Rick Minor, Late Period Settlement at the Mouth of the Columbia River
3:30 John C. Sappington and Ruthann Knudson, The Lytle Gulch Site, Shoshonean Adaptations, and Northern Great Basin Prehistory
3:45 Louis James Tartaglia, Early Prehistoric Shoshonean Contacts in Southern California
4:00 Jason W. Smith, Brian O. K. Reeves, and John M. D. Pohl, The Mission Ridge Site: A Pre-Wisconsin Human Occupation on the Southern California Coast
4:15 Richard Levy, The Linguistic Prehistory of California: A Processual View
4:35 Emma Lou Davis, Use of Tethered Balloon Photography for Analyzing Paleoamerican Sites: A China Lake Example
5:05 Wendy Hanford Arundale, A Preliminary Survey of the Cape Dorset Area, Baffin Island, N.W.T., Canada

(12) Symposium: AMERICAN SOCIETY FOR CONSERVATION ARCHAEOLOGY SYMPOSIUM ON CONSERVATION ARCHAEOLOGY
Gila
Organizer and Chairperson: Donald K. Grayson
Participants:
2:00 Deward Walker and James J. Hester, Use and Abuse of Ethnographers in Cultural Resource Management
2:25 Howard M. Davidson and Deborah Westfall, An Example of Multi-Stage Research Within a Cultural Resource Management Framework
2:50 Joseph G. Gallagher, Scarification and Cultural Resources: An Experiment to Evaluate a Timber Management Technique
4:05 J. Jefferson Reid, To Soothe the Salvage Beast
4:30 Bruce Anderson, The Antiquities Act in the 10th Circuit Court: Failure to Prosecute Due to Vagueness
4:55 Charles M. McKinney, Recent Antiquity Legislation Initiatives
5:20 Discussion

5:30 COMMITTEE ON THE STATUS OF WOMEN IN ARCHAEOLOGY
Maricopa
Open Meeting: The business of the meeting will include a panel discussion on the theoretical and methodological aspects of Women in Prehistory
6:00 OPEN HOUSE
7:30 Concourse Lobby
Cash Bar
6:00 SOCIETY OF PROFESSIONAL ARCHAEOLOGISTS
7:30 Mohave
Annual Business Meeting

Thursday evening, May 4
(16) Symposium: CONFERENDE ON Mesoamerican Ethnohistory: SAHAQÚN, The Man and His Manuscripts

Greenie
Organizer and Chairperson: Nancy P. Troike
Participants:
8:00  Arthur J. Anderson, An Note on Sahaqún’s Spanish Text
8:25  Ellen Taylor Baird, The Artists of Sahaqún’s Primeros Memoriales
8:50  Thelma S. Sullivan, Tlatanati and Tlatocoyotl in the Sahaqún Manuscripts
9:15  Wibertino Jiménez-Moreno, Sahaqún in the Intellectual Context of His Time

(17) General Session: Latin American Archaeology

Graham
Chairperson: Christy G. Turner, II
Participants:
8:00  Michael J. Sarnitski, The Earliest Ceramics from Costa Rica: La Montana, A Middle Formative Site on the Atlantic Watershed
8:20  Carl D. Speth, El Muerto Rock Shelters: A Study in Non-Ceramic Culture on the Guayas Coast, Ecuador
8:40  Marion G. Olsen, Surface Investigation of the Machalilla Component at Real Alto, Ecuador
9:05  Theresa L. Top and John R. Topic, Fortification Systems in Southern Peru
9:20  Richard P. Watson, The Reconstruction of Prehistoric Agricultural Potential from Environmental Parameters: The Chimu Case
9:50  Christy G. Turner, II and Junius B. Bird, The Dentition of the Chilean Cerro Sota-Palli Aike Cave Indians and the Poopling of the Americas

(18) Symposium: Public Archaeology in America

Gilla
Organizer: Alan Skinner
Chairpersons: Hester A. Davis and Alan Skinner
Participants:
8:00  Stuart Stuever, Private Support of Archaeology: The Northwestern University Example
8:20  Robert Greenwood, Land Developers Involvement in Public Archaeology
8:40  Larry Banks, Public Archaeology in the Corps of Engineers
9:00  S. Alan Skinner and Deborah T. Connors, Public Involvement in Field and Lab
9:20  James H. Woold, The Conserving Amateur Evaluates Professional Archaeology
9:40  Discussion

(19) General Session: Lithic Studies

Coconino
Chairperson: Mary Lee Douhle
Participants:
8:00  Mary Lee Douhle, Use of SPSS Factor in Lithic Analysis
8:15  Jeannette L. Dickerson, Kenneth C. Rozen, and Howard M. Davidson, A Multivariate Lithic Analysis of Materials from Southeastern Arizona
8:30  Richard W. Jeffreys, Lithic Artifact Diversity as a Means of Discerning Inter-Site Activity Variability

8:45  Charles M. Baker, Miimba-Mogollon Lithic Assemblage Variability
9:00  Deborah H. Olszewski and Alan H. Simmons, Memoirs of a Midden
9:15  Tony Del Bene and Kenneth Feder, Micro-Distributional Analysis in the Examination of Lithic Activity
9:30  Dennis Weder, The Functional Interpretation of Lithic Scatters During Surface Reconnaissance

(20) General Session: CONTRACT ARCHAEOLOGY

Apache
Chairperson: William J. Mayer-Oakes
Participants:
8:00  William J. Mayer-Oakes, Bureaucrats or Scholars—Who Controls Archaeological Research?
8:35  Alan H. Simmons, Move That Dirt and Pass The Buck—The New Mercenaries?
8:50  William A. Lucas, The Central and Southern Coal Projects of Utah: Methods and Results of Analysis for Two Large-Scale Contracts
9:05  Michael R. Becker, Archaeological Reconnaissance in the Southern Tularosa Basin: McGregor Guided Missile Range
9:20  Alston V. Thoms, Contract Archaeology, Research Designs and Intensive Surveys
9:35  LaMar Drollinger, Historic Research and the Cultural Resource Survey

FRIDAY MORNING, MAY 5

(21) Symposium: Local and Regional Exchange Systems: New World Case Studies

Mohave
Organizer and Chairperson: Robert E. Fry
Participants:
8:30  Robert L. Rands, Patterns of Ceramic Exchange in the Palenque Region, Mexico
8:55  Ronald L. Bishop, Ceramic Compositional Modeling at Maya Palenque
9:20  Haring L. Backman, The Distribution of Tusayan White Ware Among the Kayenta Anasazi
9:45  Paula H. Krotzer and Evelyn Rattray, Distribution of Major Ceramic Wares Produced at Tecolotlan
10:10  Lawrence P. Allen, Intra-Urban Exchange at Teotihuacan: Evidence from Mold-Made Figurines
10:35  Robert E. Fry, Models of Exchange for Functional Classes of Lowland Maya Pottery
11:00  Joseph W. Ball, Polychrome Pottery and Regional Exchange in the Early Classic Northern Maya Lowlands
11:25  Prudence M. Rice, Postclassic Pottery Production and Exchange in the Central Peten, Guatemala
11:50  Discussion: Dean Arnold

(22) Symposium: Methodological and Theoretical Issues in the Archaeology of northeastern Arizona: Examples from Black Mesa

Maricopa
Organizers: Alan T. Syenki and Stephen Plog
Chairperson: Stephen Plog
Participants:
8:00  Joseph K. Anderson, Research Dealing with Archaelogical Dating on the Black Mesa Sites: A Comparison of Methods
8:15  Jeff Hantman, and Stephen Plog, Predicting Occupation Dates of Prehistoric Black Mesa Sites: A Comparison of Methods
8:30  Shereen A. Lerner, Analysis and Functional Interpretation of Black Mesa Ceramics
8:45  Margareta Green, Variation in Chipped Stone Raw Material Use on Black Mesa
9:00  Shirley Powell McAlister, The Effets of Seasonality on Site Space Utilization
9:15  Alan T. Syenki, A Multivariate Approach for Examining the Relationship Between Surface and Subsurface Remains
9:30  Terry Kleen, Examination of Change in Social Group Size on Black Mesa
9:45  Tony Kiesler, Regional Variation on Black Mesa: A Comparison of Discrete Areas
10:00  Mark Callin, The Function of Limited Activity Sites in Prehistoric Subsistence Systems on Black Mesa
(23) Symposium: THE ARCHAEOLOGY OF EMPIRES, STUDIES OF FRONTIER EXPANSION

Greenlee
Organizer and Chairperson: Jerome Schaefer

Participants:
9:00 Robert M. Schacht, The Development of Imperial Institutions
9:20 Brad Bartel, Archaeological Operationalism of Colonialism and Imperialism: An Example from Colonial Rome
9:40 David M. Heizer, Roman Influence on the Peoples of Scotland
10:00 Jerome Schaefer, Days of Wine and Roses: The Byzantine Occupation of the Neger Desert
10:20 Break
10:30 Paula Wapnish and Brian Hess, The Zooarchaeology of Empires
10:50 David L. Brown, The Integration of Ancestral Puebloan Heritage with its Hinterlands
11:10 Thomas P. Myers, The Fringes of the Inca Empire
11:30 Terence N. D’Altroy, Timothy K. Earle, and Catherine J. LeBlanc, The Effects of Inca Expansion in the Upper Manaro Valley, Peru
11:50 Discussion: John W. Eade

(24) General Session: CULTURAL RESOURCE MANAGEMENT

Graham
Chairperson: Thomas R. Lyons

Participants:
8:00 Thomas R. Lyons and Douglas H. Scovill, Non-Destructive Archaeology and Remote Sensing: A Theoretical and Methodological Stance
8:15 James E. Bier, Remote Sensing and Large-Scale Cultural Resource Management
8:30 Galen N. Brown, Ecological Mapping for Purposes of Sample Stratification in Large-Scale Cultural Resource Assessment
8:45 Dwight L. Dragt, Automated Data Processing of Digital Aerial Imagery in Cultural Resource Survey
9:00 Cordelia T. Snow, Remote Sensing Monitoring of Impact on Cultural Resources

(25) General Session: LITHIC STUDIES II

Graham
Chairperson: E. Mott Davis

Participants:
10:00 Neal W. Ackery, Modeling Microwear Formation: A Feasibility Study Based on Fracture Mechanics
10:15 Jeanne A. Schutt, Artifact Recovery Procedures and Microwear Patterns
10:30 Laura Kosakowsky, Laurence Linford, Randall McGuire, Rebecca McSwain, John Whittaker, Richard R. Wilt, and Howard Davidson, Lithic Use Wear Research at the University of Arizona
10:45 Barbara A. Stafford, A Technofunctional Analysis of Payson Lithics: A New Method
11:00 Michael G. Spitzer, Predicting Workplace Hardness from Microliths Scans on Orthogonal Cutting Tools
11:15 Sue Lewenstein, An Analysis of Experimentally Produced Edge Damage on Obsidian Blades
11:30 Philip A. Bandy, The Technological Reconstruction of a Northern Texas Lithic Assemblage
11:45 C. Russell Stafford and Barbara A. Stafford, The Implementation of Experimental Design in Lithic Studies

(26) Symposium: PALEOINDIAN TO PLAINVILLE: HOLOCENE ADAPTATION IN THE TRUMAN RESERVOIR, SOUTHWESTERN MISSOURI
(29) Symposium: PREHISPANIC SETTLEMENT PATTERNS IN THE VALLEY OF OAXACA, MEXICO
Mohave Organizer and Chairperson: Richard E. Blanton Participants:
2:00 Margaret Curran, An Examination of the Relationships between Agricultural Productivity and Population Densities Using Satellite Data
2:20 Eva Fisch, Discontinuous Site Size Hierarchies in Formative Mesoamerica
2:40 Richard E. Blanton, Monte Albán, Oaxaca, Mexico: Patterns of Urbanism at the Ancient Zapotec Capital
3:00 Gary Feinman, The Effects of a Changing Administrative Organization on Ceramic Production Within the Prehispanic Valley of Oaxaca
3:20 Stephen A. Kowalewski, Growth and Non-Growth in the Past and Present Valley of Oaxaca, Mexico
3:40 Laura Finsten, The Classic-Postclassic Transition in the Valley of Oaxaca, Mexico
4:00 Jill Appel, The Valley of Oaxaca Late Postclassic in an Evolutionary Perspective
4:20 Discussant: Greg Johnson

(30) Symposium: PUEBLO CLIFF DWELLINGS: AN ENDURING INFORMATION SOURCE IN SOUTHWESTERN ARCHAEOLOGY
Maricopa Organizer and Chairpersons: William D. Lipe and Jeffrey Dean Participants:
2:00 Arthur Rohn, History and Potential of Studies of the Southwestern Cliff Dwellings
2:20 Robert McLandress, An Architect's View of the Mesa Verde Cliff Dwellings
2:40 Sarah Schlageter, Limits to Growth in Pueblo III Cliff Dwellings: An Examination of Eighty's Model
3:00 R. G. Matson, Locational Determinants of Cedar Mesa Cliff Dwellings
3:20 Margaret Powers, Variability in Pueblo Building Strategies in the Cedar Mesa Region, Utah
3:40 Richard V. N. Ahlstrom, Dendrochronology of the Hopi Pueblo of Walpi: A Preliminary Interpretation
4:00 Cory D. Breternitz and Bruce Hamill, Dendroarchaeology of the Johnson Canyon Cliff Dwelling, SW Colorado
4:20 Terry Walker, ML 1147, An Undisturbed Cliff Dwelling in SE Utah
4:40 Don P. Morris, Significance of Cliff Dwellings in Canyon del Muerto, Arizona
5:00 William D. Lipe, Centralized Storage at Moon House, A Pueblo III Cliff Dwelling In Southeast Utah
5:20 Discussant: Jeffrey Dean

(31) Symposium: FORENSIC ARCHAEOLOGY
Granite Organizer and Chairpersons: James W. Stoutamire and Dan Morse Participants:
2:00 James W. Stoutamire and Dan Morse, Introduction
2:10 James W. Stoutamire, Forensic Archaeology: A Course Outline
2:30 Shallagh T. Brooks and Richard H. Brooks, Archaeological Techniques Applicable to Forensic Investigation
2:50 Jack W. Duncan, Search Techniques: Buried Bodies
3:10 Martha Graham, Skeletal Recovery in Forensic Cases
3:30 Break
3:40 Dan Morse, Case Reports
4:00 Clyde Snow and Burney M. McClurkan, The Cummins Prison Excavation
4:20 Geoffrey Walker, Human Identification: Quantification and Recognition of Skull Fragments in Forensic Archaeology
4:40 Pamela R. Fesperman, Non-Human Bone Alteration and Scatter Patterns
5:00 Discussion

(32) Symposium: THE PALEOEKOLOGY OF LOWER CENTRAL AMERICA
Graham Organizer and Chairperson: Paul F. Healy Participants:
2:00 Karen O. Bruhns, Commercial Agriculture in the Postclassic: A View from El Salvador
2:20 Paul F. Healy, The Paleoecology of the Belén Farm Site (H-CN-5), Department of Colón, Honduras
2:40 Lydia L. Wyckoff, Southwestern Nicaragua: A Study of Change
3:00 Jean-Francois Moreau, Some Paleoecological Consequences of Two Volcanic Eruptions as Evidenced by the Molluscan Remains of a Costa Rican Shell Midden
3:20 Frederick W. Linge, The Ruiz Site: A Late Polychrome Occupation Near the Bay of Culebra, Costa Rica
3:40 Jeanne W. Sweeney, Ceramic Motifs and Subsistence
4:00 Richard G. Cooke, The White-Tailed Deer in Prehistoric Panama: An Hypothesis for the Manipulation of Wild Populations in the Neotropics
4:20 Discussant: Elizabeth S. Wing, Olga Linares

(33) Symposium: QUARRY SITE ACTIVITIES AND PRODUCTION ANALYSIS
Gila Organizer and Chairpersons: Jonathan E. Ericson and Barbara A. Purdy Participants:
2:00 Robin Torrence, Production for Export at the Melian Obsidian Quarries
2:20 Jonathan E. Ericson, Diachronic Change of Three Exchange Systems as Viewed Through Obsidian Production
2:40 William McDonough and Barbara Luedtke, Lithic Material Demand and Quarry Production
3:00 Frank J. Findlow and Christine A. Rudecool, Prehistoric Obsidian Use in Southwestern New Mexico
3:20 Barbara A. Purdy, Contributions of Quarry Studies to Archaeological Interpretation
3:40 Helen M. Leach, Mind Within Matter: Discovering the Technological Knowledge of Early New Zealanders
4:00 Thomas R. Hester, Quarry Sites and the Lithic Production Systems of South and South Central Texas
4:20 Discussant: M. H. Newcomer
4:40 Discussion

(34) Symposium: RECENT PALEOLITHIC RESEARCH IN THE OLD WORLD
Coconino Organizer and Chairpersons: Linda L. Taranik and Francis B. Harrold, Jr. Participants:
2:00 Catherine S. Flataker and Sheila Coulson, Mousterian Facies in England and in Mediterranean Spain
2:20 Linda L. Taranik, The Use of Attribution Analysis in the Design of Stone Tool Typologies: A Case Study Based on the Upper Paleolithic of Southwestern France
2:40 Harvey M. Bricker, Recent Results of Archaeological and Paleoenvironmental Research at Les Tchoupettes
3:00 Paul Fish, Beyond Tools: Debitage Analysis and Cultural Inference in the Middle Paleolithic
3:20 Francis B. Harrold, Jr., A Comparative Study of Eurasian Paleolithic Bifurals
3:40 G. A. Clark, L. G. Straus, J. Atuna, and D. Young, The La Riera Paleoecological Project (Asturias, Spain): Aims and Preliminary Results
4:00 Susan Bifield, Attribution Analysis of Sivlieux Burins
4:20 L. G. Freeman and Kathleen Volman, The Garbage Shall Rise Again: Stones, Bones, Charcoal and Seeds from Mousterian Levels at Abric Agut (Barcelona, Spain)
4:40 Volman, Thomas P., Middle Stone Age Artifact Variability in the Southern Cape Province, South Africa
5:00 Discussants: A. J. Jelinek, J. R. Sackett

(35) General Session: NORTH AMERICAN ARCHAEOLOGY II
Apache Chairperson: David S. Dibble Participants:
2:00 Humberto Dominguez Chavez, Los Petroglifos del Cerro San Rafael Coahuila, Un Modelo de Investigacion
2:15  Mark A. Grady, Consideration of the Texas Archaic Interaction Sphere
2:30  David S. Dibble, The Inferno Phase: Evidence for a Late Occupation in the Lower Pecos River Region, Texas
2:45  George B. Thomas, Survey Methods and Settlement Pattern at Fort Hood, Texas
3:05  Mark J. Lynch, Hunting and Gathering Site Types and Assemblage Variability in the Southern Rolling Plains
3:25  Barbara Vander Loost, The Ramey Field, Cahokia Surface Collection: Some Preliminary Results
3:40  Veleta Canouts, Ernest E. May, and Neal H. Lopinot, Upland Archaeology: An Example from Southern Illinois
3:55  Anne-Marie E. Cantwell, Hopewell Redux: Patterns of Chert Use During the Havana Tradition
4:10  E. Steve Cassells, The Judson College Site, A Late Archaic Camp in Northern Illinois
4:30  Nan Rothschild, Sarah Bridges, and Bert Salwen, The Onondaga Site: An Historical Continuum
4:45  Sarah Peabody, Turnbaugh and William A. Turnbaugh, Alternative Applications of the Mean Ceramic Date Concept for Interpreting Behavior
5:05  William A. Turnbaugh, FLOODING AS A TRANSFORMER OF THE ARCHAEOLOGICAL RECORD
5:45  SOCIETY FOR AMERICAN ARCHAEOLOGY ANNUAL BUSINESS MEETING
Community Center Music Hall
Cynthia Irwin-Williams, President
Presentation of the 1977 Alfred Vincent Kidder Award by Gordon R. Willey to Emil W. Haury
8:00  RECEPTION FOR NEW MEMBERS
Coconino
Present and past officers of the Society greet new members and members attending their first annual meeting

SATURDAY MORNING, MAY 6

(36) Symposium: MODELS OF PREHISTORIC SUBSISTENCE CHANGE
Mohave
Organizer: Andrew L. Christenson
Chairperson: Timothy K. Earle
Participants:
9:00  Timothy K. Earle, A Model of Subsistence Change
9:20  Andrew L. Christenson, Explaining Changes in the Food Niche of Human Populations
9:40  Christine A. Hastorf, Changing Resource Use in Subsistence Agricultural Groups: Predictions from an Economic Model
10:00  W. Frederick Linp, Subsistence Change and Optimization Theory
10:20  Van A. Reitheder, Simulating Optimal Resource Use in Subsistence Change
10:40  Mark N. Cohen, Carrying Capacity, Periodic Resource Failure, and the Regulation of Paleoindian Populations: A Critique of Some Recent Models
11:00  GaryUpinson, Decision Theory and Subsistence Strategies: Some Theoretical Considerations
11:20  Discussants: Robert N. Netting, Ester Boserup

(37) Symposium: NEW FRONTIERS IN THE ARCHAEOLOGY AND ETHNOCULTURE OF THE GREATER SOUTHWEST
Maricopa
Organizers and Chairpersons: Carroll L. Riley and Basil C. Hedrick
Participants:
8:30  Ellen Abbott Kelley and J. Charles Kelley, Slip Au and Pyramid Too: The Temple of the Crypt at Alfa Vista, Chalchihuites
8:55  Richard A. Pales, The Upper Rio Sonora Valley in Prehistoric Trade
9:20  Richard H. Brooks and Shellah Brooks, Cranial Deformation: Possible Evidence of Pochteca Trading Movements
9:45  John Hobgood, Aztec Aztecs and the Greater Southwest
10:10  Bertha P. Dutton, An Overview of the Galisteo Archaeology
11:00  Theodore R. Fries, Social Ranking in Chaco Canyon, New Mexico: A Mesoamerican-Derived Reconstruction
11:25  Discussion

(38) General Session: SOUTHWESTERN ARCHAEOLOGY
Greenlee
Chairperson: Robert C. Euler
Participants:
8:00  Sigra Larralde, Shared Artistic Traditions: Pottery and Textile Design Relationships in Arizona, 1100-1350
8:15  Patricia Crow Roberton, Southwestern Ceramic Classification: New Insights from the Chodistaas Site
8:30  Robin A. Gould, George R. Holley, and Veleta Canouts, Ceramic Imitation: A Supply-Demand Interpretation
8:45  E. Charles Adam, Room Size and Its Relation to Room Function
9:00  Rosalind Hunter-Anderson, The Rise of Matrifocality in the Western Pueblo Region
9:15  Robert D. Diggs, Prehistoric Exploitation of a Microenvironment in East Central Arizona
9:30  L. R. Sutro, N. W. Ackery, and R. T. Fehr, Activity Structure at Wart Rockshelter in East Central Arizona
9:45  Richard W. Effland, Jr. and Robert C. Euler, A Spatial Analysis of Kayenta Anasazi Occupation of the Inner Grand Canyon
10:00  David Batcho, Preliminary Investigations at Chavez Pass Ruins, Coconino National Forest, Arizona
10:15  Charles F. Merbs, Randall M. Smith, Jeffrey C. Long, and Donald H. Morris, Human Burials from Chavez Pass, Coconino National Forest, Arizona
10:30  Roberta A. Jewett, Social and Settlement Organization in Tonto Basin, Central Arizona
10:45  Charles J. Utterhouse, Charles F. Merbs, and Jeffrey C. Long, Hohokam Burials from the Salt River Valley, Arizona
11:00  E. Jane Rosenthal, Regional Shell Exchange in the Arizona Papagoan Region
11:15  J. Richard Ambler, The San Mateo Project So Far
11:30  Sandra L. Olsen, Micro-Wear Analysis of Utilized Bone from Grasshopper Ruin, Arizona

(39) Symposium: THE SHORT ARCHAEOLOGICAL SURVEY: PROBLEMS AND DIRECTIONS
Graham
Organizer and Chairperson: Mary Jane Butttigieg-Berman
Participants:
8:30  Stanley D. Bussey, The Small Contract as Research
8:50  Thomas J. Padgett, Problems and Promise of the Small-Scale Archaeological Survey: The Debate in the Southeast
9:10  Nina M. Versaggi, Small-Scale Survey: Methods of Organization and Management
9:30  Walter K. Wiese, The Small Survey in Regional Interpretations: The San Juan Data Base Project
9:50  Glen E. Rice and Shirley Powell McAllister, The Incorporation of Small Contract Projects into a Regional Sampling Design
10:10  David Stuart, Topographic Variability and Site Placement: Developing a Strategy for Maximizing Small Project Survey Data
10:30  Mary Jane Butttigieg-Berman, The Small-Scale Survey Report: Creation of a Data Base
10:50  Karen L. Way, Guidelines for the Design of Small Project Reports
11:10  Discussants: Hester A. Davis, George J. Gumerman, D. Green

(40) General Session: MESOAMERICAN ARCHAEOLOGY
Gila
Chairperson: Melvin L. Fowler
Participants:
8:00  Louise E. Paradis, The Political Status of the Tierra Caliente of Guerrero, Mexico: 1500-1820
8:15  Prudence Preccourt, Site Survey Techniques and Sub-Regional Settlement Patterns: The Puebla Valley
8:30  Gerald Cone, Computer Aided Analysis of Ceramics from the Puebla Preclassic Project
8:45  Melvin L. Fowler and Prudence S. Preccourt, Pre-Hispanic Lithic Industries in the Puebla Valley
9:00  Gregory B. James, Analysis of Figures from the Puebla Preclassic
9:15  William I. Woods, Field Tunnel Erosion—a Mesoamerican Example
9:30  Donovan C. Senter, The Tlachula of the Valley of Xochicalco, Morelos
9:45  Joseph B. Mountjoy, Researching the Prehistory of the Tomatlan River Valley, 1975-1977
(44) General Session: OLD WORLD ARCHAEOLOGY AND ETHNOARCHAEOLOGY

Maricopa
Chairperson: Robert E. Ackerman
Participants:
2:00 Judith A. Rasson, Interaction Spheres as Adaptive Mechanisms
2:20 Janet E. Levy, Social Organization in Bronze Age Denmark
2:40 Robert E. Ackerman and Alexei Pavlovich Okladnikov, Archaeology in the Soviet Far East: The Tadusha River Site
2:55 Harold L. Dibble, Patterns of Shape in Flakes from the Tabún Cave, Israel
3:15 Milla Y. Oehl, Conditions for Establishing Deliberate Modification of Lithic Specimens
3:35 Michael S. Bisson, Zambian Copper Workers Revisited: A Note on Variation in Ethnoarchaeological Data
3:50 Linda J. Jacobs, The Archaeological Implications of a Village in Transition: The Case of Tell-Hi Nun, Iran

(45) General Session: SOUTHWESTERN ARCHAEOLOGY II

Greenlee
Chairperson: James A. Neely
Participants:
2:00 E. Pierre Morison and T. R. Hays, New Evidence from the Jornada Branch: Excavations in the Pecos Arroyo
2:15 James A. Neely, Archaeology of the WS Ranch Site, West Central New Mexico: The 1977 Season
2:30 Solveig A. Turpin and James A. Neely, Temporal and Spatial Variability in Prehistoric Great Kivas of the Mogollon Region
2:45 Michael E. Whalen, Social-Organizational Implications of Household Distribution in a Late Mogollon Pithouse Village
3:05 Kent G. Lightfoot, Food Redistribution in the Prehistoric Southwest
3:20 Kenneth L. Kvaam, A Multivariate Model for Paleo-Demography: A Southwestern Example
3:35 Gordon J. Bronitsky, Technological Innovation and Population Pressure
3:55 Charles M. Mobley, Demographic Characteristics of Pecos Indians: A Model Based on Life Tables
4:35 Hannah Husi, Frank W. Eddy, and James J. Hester, The Blister-Starn Lake Cultural Resources Inventory
5:05 William A. Dodge, T. J. Ferguson, and Barbara J. Mills, Archaeological Investigations at Kyakama, Zuni Indian Reservation
5:20 T. J. Ferguson and Barbara J. Mills, The Growth of Zuni Pueblo

(46) General Session: SOUTHEASTERN ARCHAEOLOGY

Graham
Chairperson: Sharon I. Good
Participants:
2:00 Janet E. Rafferty, Functional Analysis of Surface Collections, Tombigbee River, Mississippi
2:15 William D. Lees and Kathryn M. Kimery-Lees, Form and Function of Colono-Indian Pottery in an Historic Plantation Context
2:30 Lois E. Sanders, Physical and Cultural Variables Affecting Phosphate Deposition and Preservation at Archaeological Sites
2:50 Chester B. DePratter and James D. Howard, Archaeological Implications of Holocene Geomorphologic and Eustatic Changes on the Georgia Coast
3:05 Robert A. Kawedski, Patricia D. O'Grady, Pamela R. Fesperman, and James W. Stoutamire, Archaeology of Mounds A and B and Plateau, Ocmuwee National Monument
3:25 Charles E. Pearson, Prehistoric Settlement Change on the Georgia Coast
3:40 David J. Hally, Activity Analysis of Three Structures from a Protohistoric Site in Northwest Georgia
3:55 Chad O. Braley, Archaeological Testing of the Bay Pines V. A. Hospital Site, St. Petersburg, Florida
4:10 Elizabeth J. Reitz, Analysis of Faunal Remains from St. Augustine, Florida
GENERAL SESSION: PALEOECOLOGY

Gila
Chairperson: David R. Yesner
Participants:
2:00 Martin R. Rose, The Extension and Quantitative Retroduction of Annual Paleoclimatic Variability on the Colorado Plateau: A Test of Two Hypotheses
2:15 Nikolaus J. Van der Merwe, F. B. Silberbauer, and J. C. Vogel, Carbon Isotopes and the Introduction of Maize to Ohio
2:30 Diane E. McLaughlin and Thomas Stafford, A Short Pollen Core from Near the Lubbock Lake Site, West Texas
2:45 Emily McClung de Tapia, Paleoethnobotanical Studies in Mesoamerican Archaeology
3:05 Elizabeth Shepard Sheldon, A Reconstruction of a Prehistoric Environment and Its Usefulness: Colonels Island, Glynn County, Georgia
3:20 Vonda L. Bohrer, A Non-Palynological Method of Reconstructing Vegetation on the Heavily Overgrazed Rio Puerco Valley of New Mexico
3:50 Kevin T. Jones, Paleoenvironment and Prehistoric Settlement Pattern in the San Luis Valley, South Central Colorado
4:05 Steven D. Emslie, An Ethnobiological Study of the Avilauna at Pottery Mound
4:25 David R. Yesner, Caribou Exploitation in Interior Alaska: Paleocoeology of the Paxson Lake Site
4:45 Frank E. Bayham, A Consideration of Species Abundance and Size on Animal Exploitation
5:00 R. Barry Lewis, Resource Dispersion and Hunter-Gatherer Band Spacing
5:20 Dolores Root, Hunter-Gatherer Social Organization and Utilization of Varying Environments

SYMPOSIUM: CULTURAL RESOURCE INVENTORY AND THE MEASUREMENT OF UNCERTAINTY IMPACTS

Cocino
Organizer and Chairperson: John G. Douglas
Participants:
2:00 John G. Douglas, The Academician’s Ideal and the Bureaucrat’s Practical: Who Wins When Legal Compliance, Budget, and Time Are Controlling?
2:25 Gay M. Kinkade, Structured Reconnaissance Survey for the San Simon-Gila Environmental Statement, Southeastern Arizona
2:50 Richard D. Malcomson, Combined Externally Biased and Random Cluster Sample Inventories in the Vermillion ES Area, North Central Arizona
3:15 Chris Kincaid, Impact Assessment Through Stratified Random Sample Inventory for the Black-Cerbat ES Area, Northwestern Arizona
3:40 Jeanne W. Fryman and Margaret A. Powers, Analysis of the Inventory Data for the Black-Cerbat Environmental Statement Area, Northwestern Arizona
4:05 Patricia A. Giorgi, A Field Test of Archaeological Sensitivity Projections in the Black-Cerbat ES Area, Northwestern Arizona
4:30 Discussants: Dorothy Hall, John Ohlson, Fred Plog, Michael B. Schiffer

SYMPOSIUM: INTERDISCIPLINARY STUDIES IN OTOMANGUEAN

Apache
Organizers and Chairpersons: J. K. Josserand and Marcus Winter
Participants:
2:00 Nicholas A. Hopkins, Otomanguan Linguistic Prehistory
2:30 Marcus Winter, M. Gaxiola, G. Hernandez, D. Deraga, and R. Fernandez, Archaeology of the Otomanguan Area
3:00 J. K. Josserand, Angeles Romero, and Maarten Jansen, Mixtec Dialectology: Inferences from Linguistics and Ethnohistory
3:30 Marlys Bacon, Loanwords in Oaxacan Ceramic Terminology
4:00 Discussants: R. Spores, M. Fowler, T. Kaufman
4:00 Discussion

ABSTRACTS OF ORGANIZED SYMPOSIA

(1) CHANGE AND INTERACTION IN THE HOHOKAM CORE AREA. The papers discuss issues that have been central in our evolving understanding of Hohokam prehistory. These are reviewed in light of new and significant research. Focal points are the origin of the Hohokam, their relationship to groups living further to the south, and processes in Hohokam technological change. The nature of exchange relationships that integrated Hohokam communities is identified as an emerging issue of crucial importance.

(2) FRONTIER SYSTEMS AND BOUNDARY PROCESSES: AN APPROACH TO INTER-REGIONAL ANALYSIS. The analysis of prehistoric and historic social systems has recently shifted to include in-sites in addition to regional variables leading to a strong growth impetus on the regional analysis of archaeological data. A further step in understanding regional dynamics is to open up the models used by archaeologists to permit examination of inter-regional processes that affect regional patterns. Frontier and boundary models provide a powerful means for identifying and incorporating inter-regional, social and ecological processes into our analyses. A series of papers will discuss frontiers and boundaries as aspects of open systems in a variety of archaeological (prehistoric and historic) contexts.

(3) SOCIAL USES OF MAYA BIOTA. Remains of plants and animals from the tropical Maya area have presented special problems in recovery and analysis. Nevertheless, a growing corps of information can now be drawn upon to provide insight into a number of aspects of Maya life. The evidence is used to reconstruct patterns of resource procurement in coastal and inland environments. Animal remains as well as bonehues give a picture of nutrition and health. Studies of shellfish reveal craft specialization. Trade in animal products can be documented. Both shells and cave faunas shed light on ceremonial and ritual practices. The iconography of plants and animals at Palenque is also discussed.

(4) DIAGNOSTICS OF THE MIDDLE HORIZON IN PERUVIAN ARCHAEOLOGY. The concept of “Middle Horizon” in Andean archaeology has suffered from numerous ambiguities of definition and usage, since its inception as a prehistoric time unit marking the widespread and nearly synchronous appearance of certain traits loosely associated with it, to the Huari and Tiahuanaco “complexes.” Participants in this symposium will examine one or more diagnostic features that have been used in the past to define this highland-based cultural matrix and its coastal manifestations. Particular emphasis will be given to the assessment of their continuing validity as horizon makers. Papers may stress redefinition, reiteration, and/or elimination of existing criteria, or may propose the use of new diagnostic features. The characteristics examined will be iconographic, technological, and systemic, and will be either area-wide or region-specific in focus.

(5) CURRENT THEORY AND RESEARCH IN GREAT BASIN ARCHAEOLOGY. In recent years the emphasis of Great Basin archaeology has shifted away from the development and testing of regional and inter-regional models of hunter-gatherer man-land relationships to address more narrowly conceived problems. In some instances, this research has pursued questions developing out of previous investigations. In other instances, workers have applied theoretical or methodological innovations to problems previously ignored or studied inadequately because they proved particularly resistant to analysis. Symposium papers reflect both the growing diversity of interests and the increasing sophistication characterizing current archaeological research in the Desert West. Individual contributions comprise environmental and archaeological analyses of prehistoric groups ranging from Paleolodians to food producers to historical sites.

(7) URBAN HISTORICAL ARCHAEOLOGY IN THE UNITED STATES. Archaeological investigations in the American urban setting have increased in recent years. This is partly a result of the interest in understanding the impact of urbanization on local human communities. Additionally, there has been a trend within our discipline toward recognizing the importance of the entire material record, including recent urban and industrial remains, in the evaluation of local and regional patterns and processes. The urban setting requires new techniques for finding, evaluating, excavating, and preserving archaeological resources. Urban historical sites present unique opportunities to combine documentary evidence, informant data, and material remains in broadly-based research strategies.
(8) REGIONAL DIVERSITY ON THE HOHOKAM PERIPHERY. The detail of archaeologists' understanding of groups living adjacent to the Gila-Salt Hohokam core area has increased drastically in recent years. This symposium reviews evidence from as far north as Flagstaff and as far south as the region of the U.S.-Mexico border. Several different hypotheses accounting for variability in the presence of Hohokam cultural materials in these areas are discussed. Interaction between these groups and those living in the core area may have covered the continuum from casual contacts to strong exchange relationships. Our understanding of Hohokam is highly dependent on correctly interpreting this interaction.

(9) RECONSTRUCTION OF SOCIAL ORGANIZATION IN NORTHERN PERU. The organizing theme of this symposium is the way in which social organization can be reconstructed in northern Peru. The main emphasis is on the coast, with some discussion of the highlands. The cultures that are represented are Moche, Chimú, and Inca. Each paper presents a specific body of data (ceramics, architecture and ethnohistorical records) or a particular problem (e.g., hosting organization, reaction to socioeconomic stresses, imperial organization). The symposium is intended as an example of the methodology involved and the way in which the different kinds of data can be used to cross-check each other.

(10) MAYA ECOSYSTEM AND AGRICULTURE FROM THE PERSPECTIVE OF THE NATURAL SCIENCES. Recent research on the prehispanic Lowland and Maya Caste fields has become a major focus of Maya research, including studies of subsistence systems, settlement patterns and trade networks, a minor emphasis on the distribution and nature of prehispanic lowland tropical ecosystems. The archaeological record lacks the potential for landscape reconstruction, except for indirect evidence from ceramics and other phytoliths. This symposium presents the non-archaeological view of the prehispanic Maya Lowlands to provide an independent view of the environmental matrix of the prehispanic Maya. Results of pollen analysis, pedology, geomorphology, and other disciplines produce a rapidly expanding body of knowledge that may be integrated with present archaeological research to derive unified models of environmental interactions of the Maya Civilization.

(11) AMERICAN SOCIETY FOR CONSERVATION ARCHAEOLOGY SYMPOSIUM ON CONSERVATION ARCHAEOLGY. This symposium examines diverse aspects of cultural resources management in North America. The symposium concludes with an exhibition and discussion of proposed changes in federal antiques legislation in the United States.

(12) NON-STRUCTURAL SITE DISCOVERY IN HEAVILY VEGETATED AREAS: METHODOLOGIES AND TECHNIQUES. The papers comprising this symposium report on specific applications of various site discovery and examination methodologies and techniques in areas of heavy vegetation, including grass, brush, and trees. Archaeologists' ability to reconstruct and analyze past cultural systems is directly dependent upon their ability to discover and analyze cultural remains of such systems. In many parts of the world site discovery and examination are hindered by heavy vegetation. The effectiveness of various approaches for site discovery and examination under such conditions is critically evaluated by these papers. Factors such as cost, time and equipment necessary and other theoretical or practical constraints are considered.

(14) THE ANTHROPOLOGY OF EARLY HAWAII. This symposium is designed to report recent advances in the field of prehistory in the archaeological study of the precontact and early historic Hawaiian islands. Recent and ongoing research explores problems of chronology, ecology, technology, demography, and social/cultural evolution in the context of extreme spatial isolation, mild climate, limited land area, short time sequence, and a complex sociopolitical system. Special attention has been given to the role of cultural remains as diverse as geology, zoology, ecology, etnography, history, physics, and demography in studying ancient Hawaii.

(16) CONFERENCE ON MESOAMERICAN ETHNOHISTORY: SAHAGUN, THE MAN AND HIS MANUSCRIPTS. This symposium will focus upon the documentary materials of the great Mesoamerican ethnographer Bernardino de Sahagun, who left lengthy descriptions and explanations of the cultures and archaeology of ancient Mexico. It will show the relationship of these data to our understanding of both pre-Conquest and post-Conquest problems. The participants, who are from Mexico, Europe, and the U.S., have been selected to reflect a broad representation of the current research in the complex interdisciplinary field. Their papers will demonstrate how publication of these primary sources can contribute to resolving archaeological, anthropological, and ethnohistorical problems.

(18) PUBLIC ARCHAEOLoGY IN AMERICA. Archaeology in America is supported consciously or unconsciously by the general public, the great uninterested public, who faithfully pay taxes and sponsor legislation. Historically, archaeologists have hidden themselves away from the public. This symposium will focus upon the public in the ivory tower or dark recesses of an institution of higher learning, but the advent of public archaeology is forcing archaeologists to become ever increasingly accountable for their actions and is placing them in the public spotlight. This symposium will show how the people of America are being informed about the findings of ongoing field and laboratory investigations and how they are being involved in the day-to-day protection and conservation of the irreplaceable remains of America's heritage. Suggestions for increasing public awareness will be offered and papers will focus on the "how to" aspects of public education.

(21) LOCAL AND REGIONAL EXCHANGE SYSTEMS: NEW WORLD CASE STUDIES. Recent studies of local and regional cultural exchange systems have concentrated on segment size and distribution, size and distribution of systemic exchange structure can also be generated from detailed technical and stylistic studies of locally produced and/or distributed items. This symposium will examine local and regional exchange systems based on studies of ceramics from several areas in the New World. A variety of approaches useful in disseminating such systematic studies are presented. The advantages of regional and site based programs of analysis are reviewed.

(22) METHODOLOGICAL AND THEORETICAL ISSUES IN THE ARCHAEOLOGY OF NORTHEASTERN ARIZONA. The Yavapai Community of Black Mesa. The pace of archaeological research in northeastern Arizona has quickened in the last decade with the increase in funding for contracts with private companies and public agencies. The increased amount of new data gathered through problem-oriented research, has enabled in-depth studies that focus on (1) substantive issues related to the study of prehistoric lifeways, and (2) methodological and theoretical issues of interest to the archaeological community in general. Specifically, this symposium will focus on the evolution of procurement systems, community and settlement patterns, and a variety of methodological problems.

(23) THE ARCHAEOLOGY OF EMPIRES: STUDIES OF FRONTIER EXPANSION. Despite social, economic, and political complexity, it is possible to observe similar processes operating in all expanding political systems. Lathem made this evident from the historical comparison of frontier areas and he recognized the importance of archaeological work in these areas where historical documents are lacking or minimally useful. This symposium will present ongoing research from historical and non-historical contexts, in the Old and New Worlds, that are helping to formulate principles by which empires expand and subjugated populations adapt to that expansion.

(26) PALEOINDIAN TO PLAINVILLE: HOLOCENE ADAPTATION IN THE TRUMAN RESERVOIR, SOUTHEASTERN MISSOURI. The papers synthesize over a decade of research in the esoterically demanding Ozark Highland, South-central U.S. An interdisciplinary approach has yielded new perspectives on Ozarkian adaptations to cultural environments that provide for social, economic, and adaptive technology. These studies contribute to the understanding of prehistoric man and his environments: a case study in the Ozark Highland (Academic Press 1974); work conducted under auspices of the U.S. Army Corps of Engineers.

(28) HUMAN ECOLOGY AND ADAPTIVE TECHNOLOGY AT HINDS CAVe, VAL VERDE COUNTY, SOUTHWESTERN JUAREZ, TEXAS. This symposium presents a series of papers on the human ecology and adaptive technology of the lower Pecos River area. Hinds Cave was utilized over a 10,000-year span by a continuum of hunter-gatherer populations. The dry cultural deposits contain remarkably well-preserved perishable materials and provide an unusually accurate view of the environment, human ecology, and adaptive technology. These studies contribute to a significant body of data pertinent to examining the adaptive strategies of pre-agricultural and non-agricultural foragers of the desert Southwest and northern Mexico.

(29) PREHISPANIC SETTLEMENT PATTERNS IN THE VALLEY OF OAXACA, MEXICO. The symposium summarizes the results of five seasons of systematic archaeological survey in the Valley of Oaxaca. To date the work completed includes the detailed mapping and extensive surface collection of Monte Alban, the ancient regional capital, as well as roughly 75% of the surface area of the valley. The papers will deal with problems related to population and cultural distributions and socio-cultural evolution, and changing modes of political and economic organization.

(30) PUBLIC CLIFF DWELLINGS: AN ENDURING INFORMATION SOURCE IN SOUTHWESTERN ARCHAEOLOGY. For nearly 100 years, the Pueblo cliff dwellings of the Southwest have held the attention of both archaeologists and the general public. This symposium documents the continuing scientific interest in these phenomena, as they are approached with new questions and research methods.

(31) FORENSIC ARCHAEOLOGY. Criminal investigators frequently encounter human remains in either buried or surface locations. Usually these remains are partially or completely skeletonized. In the past the quality of the recovery of this material has been haphazard. Difficulties in identification of recovered material and prosecution in criminal cases have given rise to an interest
in archaeological recovery and anthropological interpretation of human material. This symposium examines this problem from an anthropological and criminological perspective and outlines the results of current work in this developing field.

(32) THE PALEOECOLOGY OF LOWER CENTRAL AMERICA. Integration of archaeological research in several locales of Lower Central America in the last decade has provided a more complete time-space framework for archaeologists, and simultaneously permitted exploration of more complex problems dealing with human adaptation and cultural response to the varied environmental setting of the isthmian zone. One major topic that has received recent archaeological attention in this culture area is paleoecology. Zooarchaeological and paleobotanical studies in Lower Central America are providing much needed data on the problems and questions of ancient human ecology, prehistoric climatic and environmental changes, food procurement and subsistence practices, resource management, and trade. The papers of the symposium examine current paleoecological research from several aboriginal sites and regions of Lower Central America.

(33) QUARRY-SITE ACTIVITIES AND PRODUCTION ANALYSIS. Recently several papers have explored some of the interrelationships between quarry production and regional exchange of lithic resources. This is a timely subject that may act to synthesize two important areas of archaeological research. At present, there is a critical need to address both theoretical issues and operational problems for future research. The symposium focuses on these areas and will include the procedures and data that document production modes and their changes in time, and how to discriminate discrete workshops in space-time. Once research is operationalized, a number of new problems can be investigated.

(34) RECENT PALEOLITHIC RESEARCH IN THE OLD WORLD. Anthropologically-oriented archaeology has much to offer to the study of Pleistocene cultural systems in the Old World. Gathered here are recent examples of such research, which may be grouped into three categories: (1) reports on multi-disciplinary investigations of Paleolithic occupation sites; (2) quantitative analyses of lithic artifact variability (both single-site and regional studies), which deal with systematics and the extraction of information about past human technological and subsistence activities; and (3) comparative papers that look at already-published data in new ways. Despite varying geographical and methodological focus, all the contributions involve attempts to expand our understanding of the lifeways of Pleistocene hunter-gatherers.

(35) MODELS OF PREHISTORIC SUBSISTENCE CHANGE. The tremendous variation in human food procurement and consumption across space and through time is a phenomenon of great significance to those interested in explaining human behavior. Archaeologists are fortunate to be in a strong position to make basic contributions to the understanding of long-term subsistence change in human populations. This symposium provides examples of the variety of theoretical and methodological approaches available for the study of prehistoric subsistence. The papers demonstrate important areas of overlap between the disciplines of economics, ecology, and anthropology.

(36) NEW FRONTIERS IN THE ARCHAEOLOGY AND ETHNOHISTORY OF THE GREATER SOUTHWEST. Drawing on work in progress by archaeologists, ethnohistorians, and cultural geographers, this symposium presents a cross section of new studies on the prehistory and contact history of the Greater Southwest. Symposium participants combine and reconcile the research approach to Southwestern archaeology with the recent flood of evidence that massive contact, both within the Greater Southwest and from outside—especially from Mesoamerica—was a major factor in shaping Southwestern cultures.

(37) THE SHORT ARCHAEOLOGICAL SURVEY: PROBLEMS AND DIRECTIONS. The short, small-scale archaeological survey constitutes the bulk of contract archaeology, but has been ignored as a rich data base in favor of the large-scale regional survey. This symposium concentrates on the research potential offered by the small contract survey. A series of research designs that have been employed to direct this mode of data retrieval is presented. A demonstration of how data can be integrated into predictive settlement models is evaluated in relationship to the biases inherent in small survey investigations. Finally, a means of communicating small survey data to others is presented in a theoretical research framework, as well as to provide information required by contracting agencies and planners for the management of resources—presented in a model designed for small project reports.

(41) PALEOETHNOBOTANICAL ROUNDTABLE: THE IDENTIFICATION AND INTERPRETATION OF EVIDENCE FOR PALEOETHNOBOTANICAL RECONSTRUCTIONS IN THE SOUTHWEST. The methods and models for reconstructing the patterns of plant utilization from archaeological sites in the Southwest will be discussed by the participants of this roundtable. Evidence of domesticated, cultivated, and non-cultivated plants will be examined from the perspective of new methods of identification, alternative models of interpretation, and directions for future research. The importance and implications of associated botanical evidence—charcoal, pollen, seeds, phytoliths, etc.—will be reviewed and debated by the participating paleoethnobotanists. Questions and comments from the audience are encouraged.

(42) THE CORONADO ARCHAEOLOGICAL PROJECT: RESEARCH IN THE PREHISTORY OF EASTERN ARIZONA. The papers to be presented are the result of several years of research at sites impacted by the construction of the Coronado Power Station near St. Johns, Arizona. The problems of administration of a large research project are discussed, as are the research problems encountered in arbitrarily selected data samples. The results of research in Archaic settlement, lithic chronology, and Puebloan settlement and ecology in the Puerto River-Little Colorado River basin are discussed.

(43) TRACE ELEMENT ANALYSES OF CHERT: PROBLEM-ORIENTED RESEARCH. The papers in this symposium present the results, from several years of ongoing research across the country, of the "fingerprinting" of chert sources via various analytical techniques. In addition to the technique and analytical parameters, the uses of the various data sets are noted, with the emphasis on the delineation of, or solution to, specific archaeologically/geological problems. The emphasis of these papers is on the problems and their delineation and solution rather than on the presentation of large amounts of technical data.

(48) CULTURAL RESOURCE INVENTORY AND THE MEASUREMENT OF UNCERTAIN IMPACTS. The USDI Bureau of Land Management has been required by court order to produce a total of 212 Environmental Statements on its domestic livestock grazing program by 1988. In Arizona this involves 13 statements encompassing 12.5 million acres. This environmental analysis requirement has put cultural resource inventory, evaluation, and sensitivity assessment on a radically accelerated schedule, and has called for considerable innovation in the application of sampling methods and analytical techniques. To date, three distinctive approaches have been taken in Arizona; this symposium examines each from both compliance and professional contribution points of view.

(49) INTERDISCIPLINARY STUDIES IN OTOMANGUEAN. The development of a culture area may be investigated from various perspectives. Archaeology provides insights into material culture, socio-political organization, and regional relationships. Historical linguistics reveals regional relationships; reconstructions of vocabulary reflect prehistoric culture. Ethnography and ethnography furnish more direct evidence for later periods. When focused on common problems, these disciplines form a powerful tool in the reconstruction of culture history. Otomanguean as a culture area has until recently been neglected, although significant contributions exist in various sub-areas. This symposium presents two overviews (linguistics and archaeology) and two specific examples of interdisciplinary investigation, with discussion by specialists from archaeology, linguistics, and ethnography.
Pueblo Revolt of 1680; (2) earlier beams come from a village founded by A.D. 1400; (3) lack of dates between 1710 and 1880 results from sampling problems, lack of construction, or recent dismantling of upper story structures; and (4) many old structures were dismantled and new ones built between 1880 and 1940, reflecting changes in the use of Walpi and/or changes in Hopi life style. (30)

Aikens, C. Melvin (see Mehringer, Peter J., Jr.) (35)

Aldenderfer, Mark S. (Missouri-St. Louis) EMPIRICALLY EVALUATING MULTIVARIATE STATISTICAL METHODS: SITE TYPOLOGIES AND CLUSTER ANALYSIS. Although multivariate statistical methods are frequently used in archaeological research, few attempts have been made to evaluate the performance of these data sets with known structure. This type of evaluation is especially necessary where little or no theoretical justification for the use of any multivariate method exists, such as in archaeology. This paper presents a series of experiments designed to evaluate how well certain cluster analysis methods reconstruct site typologies based on functional attributes. Although the focus of the paper is restricted, it will be demonstrated that the results obtained show striking convergence with evaluation studies from different scientific disciplines on very different data sets, thus increasing the significance of the results. Pragmatic suggestions on the use of cluster analysis will be offered for a variety of archaeological situations that are likely to occur in many applications. (15)

Allen, Lawrence P. (SUNY-Buffalo) INTRA-URBAN EXCHANGE AT TEOTIHUACÁN: EVIDENCE FROM MOLD-MADE FIGURINES. Among the items collected in the course of the Teotihuacán Mapping Project survey are a variety of mold-made figurines. This paper considers patterning in the distributions of two related classes of these, manufactured artifacts. Sets of figurines recovered from a single mold can be identified. Products produced from a series of simulation models utilizing varying stipulations concerning the loci of figurine production, exchange, and utilization are compared with the characteristics of the actual arrangements of sets discovered in order to estimate paths travelled by the products of a common mold to discard and ultimate collection. (21)

Altuna, J. (see Clark, G. A.) (34)

Amadeo, Rea (see Hamblin, Nancy L.) (3)

Ambler, J. Richard (Northern Arizona) THE SAN MATEO PROJECT SO FAR: Intensive survey in the area of San Mateo, northwestern New Mexico, has shown evidence of several thousands of years of occupation, with the most intensive utilization of the area occurring during the climatic optimums around the 1100's and early 1700s. These periods have been the subject of intensive excavations at a small Anasazi village and an early Navajo settlement. Architectural features, artifact analysis, and ecological subsistence data are summarized, with emphasis on the intensive ceramic analysis and the data relating to subsistence patterns, and how the information gained to date affects our planning for future work. (38)

Anderson, Arthur J. A NOTE ON SAHAGÜN'S SPANISH TEXT: While usually the Spanish text of Sahagún's General history glosses and summarizes rather than translates the Nahua, the Spanish sometimes gives fuller information than the Nahua itself does. Such differences in the texts are of various kinds and may be variously explained. The texts are quite often complementary and are best so used. (16)

Anderson, Bruce (NPS) THE ANTIQUITIES ACT IN THE 10TH CIRCUIT COURT: FAILURE TO PROSECUTE DUE TO VAGUENESS: A recent attempt to prosecute an alleged violation of the Antiquities Act in the 10th Circuit Court failed in August, 1977, because of vagueness in the Act in general, and because of the Diaz decision in specific. The decision extends the vagueness interpretation into the 10th Circuit, whereas before it had affected only the 9th Circuit. The details of the case are presented and legislative means of coping with these difficulties are suggested. (12)

Anderson, Joseph K. (Siu-Carbondale) RESEARCH DEALING WITH ARCHAEOLOGICALLY DATING BLACK MESA. Two types of experiments with the use of archaeomagnetic dating procedures on Black Mesa are discussed. Types of samples taken, the procedures involved and the types of data extracted are dealt with. In addition, the use of this technique as both a dating tool and a method for understanding cultural variability at the intrasite and intersite levels is examined. (22)

Andrews, R. (see Adovasio, J. M.) (26)

Appel, Jill (Purdue) THE VALLEY OF OAAXACA LATE POSTCLASSIC IN AN EVOLUTIONARY
Baker, Craig (SIU-Carbondale) THE USE OF NATURAL TOPOGRAPHIC DATA FOR PREDICTING SITE LOCATIONS: AN EXAMPLE FROM THE CENTRAL ARIZONA ECOTONE PROJECT. A method is proposed for use in describing the physical setting of sites within a region. An area is partitioned into a population of grid cells. A subpopulation of grid cells, surrounding each site is then used to locate sites. Results obtained through application of this method in an area in central Arizona are discussed. The effectiveness of this method in predicting site locations is evaluated. (15)

Baker, Larry L. (Eastern New Mexico) A NON-TYPOLOGICAL CERAMIC METHOD FOR FINE CHRONOLOGICAL DISTINCTION. Typologically derived ceramic data has not provided sufficient precise chronological information for dealing with network exchange relationships in the Middle Rio Puerco Valley of New Mexico. Subsequently, a non-typological ceramic approach was developed incorporating attributes, vessel morphology, and vessel form. These attributes were utilized to evaluate the chronologic sensitivity of attributes within stratigraphic proveniences. Attributes that were initially defined as temporally sensitive were further investigated to test their correlation and independence. Various multivariate techniques incorporating independent sensitive attributes were employed to order known stratigraphic proveniences at the intra- and inter-site level. (6)

Ball, Hal C. (The Institute for Maya Studies) ARCHAEOLOGICAL INVESTIGATIONS AT LAMANAI, BELIZE. The Royal Ontario Museum of Toronto, Canada, has been actively engaged in archaeological investigations at the Maya site of Lamanai since January of 1973. This paper will summarize the results of excavations as of the end of the 1977 season, with emphasis on the structures located within the southern and central part of the site. (27)

Ball, Joseph W. (San Diego State) POLYCHROME POTTERY AND REGIONAL EXCHANGE IN THE EARLY CLASSIC NORTHERN MAYA LOWLANDS. Over the past half century, a repulsion-filled model of Lowland Maya polychrome pottery production and distribution has developed which posits a southern Lowland—primarily northcentral Petén—origin for such decorated wares in combination with a literally rapacious northern Maya market. This model is examined in light of recent stylistic and non-analytical physical studies of third through seventh century A.D. polychrome decorated pottery from selected sites in the northern and southeastern Lowlands and an alternative reconstruction is offered. (21)

Bandy, Philip A. (Texas Tech) THE TECHNOLOGICAL RECONSTRUCTION OF A NORTHERN TEXAS LITHIC ASSEMBLAGE. The study of chipped stone tools has utilized various approaches that include interpretation of function, morphological classification, and replication. This paper reports a laboratory study that examined the manufacturing process responsible for the making of a prehistoric Texas assemblage. It reconstructs the lithic manufacturing technology using a combination of traditional descriptive analysis and clipping replication. A technological model or reconstruction was developed, then tested. This approach permits an interpretation herefore not possible and is applicable to other lithic studies. The study assemblage represents the second of three distinct stages of manufacturing in the production of finished and partially finished artifacts for large-scale trade of Alabates flint. (25)

Banks, Larry (U.S. Army Corps of Engineers) PUBLIC ARCHAEOLOGY IN THE CORPS OF ENGINEERS. By planning interpretative development on civil works projects and on specific sites where such developments are warranted, the Corps of Engineers is attempting to provide a mechanism for expressing archaeological goals and the results of investigations to the general public. This paper reviewed the literature and recommendations for cooperative agreements between participating parties are made. It is essential to give the public something in return for the amount of money that have been and are currently being expended for archeology on civil works projects. (18)

Bard, James C. (Lawrence Berkeley Laboratory) GREAT BASIN PETROGLYPHS: RELATIVE DATING BY NEUTRON ACTIVATION ANALYSIS. Recent investigations—conducted at the Lawrence Berkeley Laboratory—of desert varnish chemistry and nuclear measurements of petroglyph surfaces from the western Great Basin have shown that a relative dating system based on neutron activation and X-ray fluorescence analyses is feasible. Results of preliminary tests on selected petroglyphs from western Nevada confirm accepted chronological ordering of Great Basin petroglyph styles. (5)

Barrera Rubio, Alfredo (Yucatán) A STUDY OF SETTLEMENT PATTERNS IN THE UXMAL AREA, YUCATÁN, MEXICO. The results of a preliminary settlement pattern study in the Uxmal area are described. The study concentrated on the relationship of the civic-ceremonial center, which is enclosed by a moat, with the surrounding residential zones and their related features. Variable soil types and the absence of available water sources appear to be conditional factors in dis-
Barret, Brad (San Diego State) ARCHAEOLOGICAL OPERATIONALISM OF COLONIALISM AND IMPERIALISM: AN EXAMPLE FROM PROVINCIAL ROME. Archaeologists lack explicitly developed procedures for studying cultural processes of colonialism and imperialism. When dealing with state societies in economic and political context with other cultures of various degrees of organizational complexity, it becomes necessary to distinguish patterns of ethnic boundary making and cultural interaction. The more radical side of colonialism and imperialism is presented, the Roman provinces of Pannonia and Upper Moesia present evidence, both archaeological and ethnographic, supporting a revised methodology for the study of colonialism and imperialism. Research conducted on urban and rural populations is presented, representing plural ethnic situations under different mechanisms of social control. (23)

Batcho, David (Arizona State) PRELIMINARY INVESTIGATIONS AT CHAVEZ PASS RUINS, COCONINO NATIONAL FOREST, ARIZONA. Chavez Pass Ruins, one of the largest prehistoric sites in the Southwest, is located in the Coconino National Forest, 30 miles southwest of Winslow, Arizona. It consists primarily of three large pueblo room blocks, extensive burial areas, and a number of associated features. A preliminary investigation of the site was carried out in July, 1977, by the University of the study of the artifacts, including the differential distribution of ceramic and lithic material, is discussed, as well as evidence for differences between the three pueblo units. Plans and suggestions for future work at the site are also discussed. (36)

Bawden, Garth (Harvard) THE SOCIAL CONTEXT OF MOCHE V CERAMICS. Studies of Moche pottery have been chiefly chronological and iconographic. A Moche V collection from the urban site of Galindo enables the study of the ceramics in their total cultural setting. Comparison of these data with early Moche and later Chimú ceramic styles indicates the probable nature of social development during these cultural periods. A trend toward increased social stratification, administrative centralization, and the rising importance of secular aspects of social integration is suggested by the Galindo pottery and its context. (9)

Bayham, Frank E. (Arizona State) A CONSIDERATION OF SPECIES ABUNDANCE AND SIZE ON ANIMAL EXPLOITATION. Subtle intra-regional variability was observed between faunal assemblages from archaeological sites within the Copper Basin region, west-central Arizona. By focusing on the attributes of species abundance and size, the study of the importance of species that most contributed to the overall variability in size and shape of the faunal remains. Lacking modern comparative biomass data, the attempt was made to derive ecological implications for these differences from models of optimal diet. These implications are evaluated for their potential to explain and predict. (47)

Beckes, Michael R. (Illinois State College) ARCHAEOLOGICAL RECONNAISSANCE IN THE SOUTHERN TUCSON BASIN, MCGREGOR GUIDED MISSILE RANGE. Some results of a recent preliminary archaeological reconnaissance of the McGregor Guided Missile Range in Otero County, New Mexico are presented. Cultural remains indicating aboriginal occupation of the area from the Archaic to Formative times are briefly discussed. Some general conclusions on the nature of the long term cultural change in the study area are advanced. The potential significance of the cultural resources of the area, and specific directions for future research efforts are presented. Some specific operational problems encountered on this large magnitude cultural resource inventory and assessment project are outlined. (20)

Berr, Claudia (Museum of Northern Arizona) LITHIC ANALYSIS OF ASSEMBLAGES FROM NORTHERN ARIZONA. This paper represents a progress report on the analysis of lithic material from preceramic and ceramic sites in northeastern Arizona. The large number of sites located along the Coronado Transverse Ranges in the Lowland Maya region. Examination of tool surfaces of up to the 6th degree of polynomial, an analysis of variance, and maps of the residuals, demonstrate the utility of the technique. Results of the analysis shed further light on the processes involved in the collapse of the Classic Lowland Maya. (27)

Bohler, Vorsila L. (Eastern New Mexico) NEW POLYNOMALY METHOD OF RECONSTRUCTING VEGETATION ON THE HEAVILY OVERGRAZED RIO PUEBRO VALLEY OF NEW MEXICO. Seven major steps are followed in reconstructing heavily overgrazed vegetation. Collect, identify, and understand the modern species. Accumulate lists of plant species (inventories) growing on each example of a landform. Classify each species as an increaser or decreaser with grazing. Seek verification from travel accounts, floras of the area, historical literature, etc. For decreasers, determine the range of landforms, each occupied by different species of domesticated, and maps of the area, and maps of the area. (50) For increasers, determine the range of landforms, each occupied by different species of domesticated, and maps of the area. (50)

Boe, Frederick J. (UCLA) TREND SURFACE ANALYSIS AND THE LOWLAND CLASSIC MAYA COLLAPSE. The methods of trend surface analysis, a form of regression analysis, are applied to complex archaeological surfaces derived from a series of points representing the most recent data. Discard standard techniques in the Lowland Maya region. Examination of trends surfaces of the area. Results of the analysis shed further light on the processes involved in the collapse of the Classic Lowland Maya. (27)

Bowen, William R. (see Dickens, Roy S., Jr.) (7)

Bradford, James E. (Museum of Northern Arizona) THE NATURE OF ARCHAEOLOGICAL TRANSACTS IN REGIONAL STUDIES. The Museum of Northern Arizona has intensively studied 47 archaeological sites impacted by the construction of the Coronado Power Station railroad spur that runs between the Pueblo River valley and the Little Colorado River valley. The peculiar, purposeful transect nature of the project presents advantages and disadvantages in the interpretation of archaeological data on a regional scale. Part II discusses the actual data...
recovered on the railroad project, and its relationship to the theoretical and methodological problems presented by a regional transect. The discussion will center on specific classes of recovered data from several selected sites. (42)

Braley, Chad O. (Florida State) ARCHAEOLOGICAL TESTING OF THE BAY PINES V.A. HOSPITAL SITE, ST. PETERSBURG, FLORIDA. A multi-component mound-midden site, 8 PI 64, is located on the Bay Pines V.A. Hospital grounds on Boca Ciega Bay in St. Petersburg, Florida. A portion of this site was tested by Florida State University for a period of six weeks. The area was augured, noting the presence or absence of midden areas and a topographic map was completed. Twenty-seven units were excavated, with 12 units being placed in the midden. Material goods and architectural features were scarce, but valuable data concerning Archaic dietary and seasonal settlement patterns was recovered. On the basis of frequency of migratory shellfish (scallop), seasonal site usage is suggested. (48)

Brenner, Mark (see Deevey, E. S.) (10)

Breternitz, Cory D. (Arizona) DENDROARCHAEOLOGY OF THE JOHNSON CANYON CLIFF DWELLINGS, SW COLORADO. Nine Mesa Verde Branch cliff dwellings on the Ute Mountain Indian Reservation were mapped and 461 tree-ring samples were collected in 1974. Two clusters of cutting dates consistently occur at the sites—one in the middle 1200's and another in the early 1300's. Implications of the dating clusters are discussed. The tree-ring samples provide insights into cultural patterns through the identification of beam-reuse, differential use of species, seasonal cutting activities, and use of parts in different structures. The identification of wood species also permits some inferences about the prehistoric environment. (30)

Bricker, Harvey M. (Tulane) RECENT RESULTS OF ARCHAEOLOGICAL AND PALEONENVIRONMENTAL RESEARCH AT TAMBOUTRES. Les Tambouroues (Commune de Couteaurde, Haute-Garonne) is a large, open-air Chiffleurian site in the Petit-Pyrenes region of southwestern France. The Tulane excavations of 1973 and 1975 have produced an assemblage of over 500,000 stone tools, and a series of radiocarbon dates. The relative late Chiffleurian typology is corroborated by the geochronologic data developed by the paleonenvironmental research carried out at the Institut du Quaternaire of the University of Bordeaux. The results of this research are summarized in the paper. (34)

Bridges, Sarah (see Rothschild, N. J.) (35)

Bronitsky, Gordon J. (Texas-Permian Basin) TECHNOLOGICAL INNOVATION AND POPULATION PRESSURE. Research conducted at Arroyo Honda, a late prehistoric Pueblo site near Santa Fe, New Mexico, tested hypothesized relationships between increased population density and technological innovation. Significant changes occurred in three realms: increasing effective agricultural technology, attempts to minimize food waste, and rescheduling of some activities away from seasons of peak agricultural labor input. (45)

Brooks, Mark (South Carolina) A STRATEGY FOR DETERMINING THE EXTENT AND VARIABILITY OF ARCHAEOLOGICAL SITES IN TEMPERATE FOREST LOCALITIES. Our problem concerned determining the extent and variability of artifactual deposits on a heavily forested ridge in coastal South Carolina (Huger Site, 38BE211). To gain a representative sample and minimize costs, we developed a subsurface testing procedure using a stratified unaligned sampling strategy. The ridge was divided into 45 topographic areas and 100 test pits proportioned according to the area of each of these areas. A series of maps was generated from the excavated material to form the basis for subsequent excavation design. The paper discusses and evaluates the practical and methodological aspects of the sampling strategy. (13)

Brooks, Richard H. (Nevada-Las Vegas) CRANIAL DEFORMATION: POSSIBLE EVIDENCE OF POCHEGA TRADING MOVEMENTS. The archaeological significance of the limited occurrence in the Greater Southwest of skulls with tabular oblique deformation may provide evidence of individual mobility from Nuclear Mesocama. The deformation may relate to the movements of pochegas into the northern front range along a trading corridor of the Sierra Madre Occidental. The inference is that skulls with tabular oblique cranial deformation are evidence of individual pochega in an area outside of Nuclear Mesocama. (37)

Brooks, Richard H. (see Brooks, S. T.) (31)

Brooks, Shelagh T. (Nevada-Las Vegas) ARCHAEOLOGICAL TECHNIQUES APPLICABLE TO FORENSIC INVESTIGATION. Techniques utilized in archaeological survey and excavation are applicable to forensic. Walking transects and recording objects through establishment of a grid system could be vital in forensic search investigations. Photographing items in situ within this delineated grid system provides a means of recording evidence encountered during search procedures. Excavation stage controlled vertical and horizontal units, and methods of archaeological recovery of skeletal materials are particularly appropriate for forensic investigations. The teaching of archaeological survey and excavation techniques is part of a developing cooperative program between the Anthropology Department and the Criminal Justice Program at the University of Nevada, Las Vegas. (31)

Brooks, Shelagh (see Brooks, R. H.) (37)

Brown, David L. (Washington-St. Louis) THE INTEGRATION OF ANDEAN TIWANAKU WITH ITS HINTERLANDS. The second period of Andean empires is characterized by two competing states—Warri (A.D. 500-800) and Tiwanaku (A.D. 400-1000). The different general patterns of organization that we can reconstruct, with the Warri mainly dependent upon military coercion as contrasted with the more egalitarian economic interdependence of the Tiwanaku federation, helps to explain their differing rates of development and their differing rates of change. With the collapse of Warri, we can document a shift in the altiplano-based Tiwanaku organization, with expansion into the Pacific coastal areas previously on the Warri frontier, and simultaneous new interactions with the Amazonian yungas-producing areas. (23)

Brown, Galen N. (NPS) ECOLOGICAL MAPPING FOR PURPOSES OF SAMPLE STRATIFICATION IN LARGE-SCALE CULTURAL RESOURCES ASSESSMENT. Both Federal policy and archaeological practice have often called for "inventory survey" as a viable first stage in cultural resource management efforts. As assessment and conservation efforts increase in number and especially in size, however, it becomes apparent that finding each site is impossible. Nonetheless, some idea of the nature and distribution of sites is necessary for the planning of subsequent mitigation, conservation, and research. This problem can be solved through the application of multistage random sampling design based on environmental stratification. Remote sensing methods, which provide an efficient means of such regional stratification, will be discussed. (24)

Brown, Patricia Eyring (see Rogge, A. E.) (15)

Brubaker, Karen O. (San Francisco State) COMMERCIAL AGRICULTURE IN THE POSTCLASSIC: A VIEW FROM EL SALVADOR. Recent investigations at Chihuatan, a terminal Classic/Mayan site in eastern El Salvador, have indicated that a major cause of the origin of this city was the cultivation of crops and the cultivation of these crops in the area. The evidence of the present and past of Chihuatan and other Mesopotamian and lower Central American cultures raises new questions about participation in the late prehistoric cultural and economic sphere and especially about the mechanics of the Mesopotamianization of the southern frontier at this time period. (32)

Bryan, Vaughn M., Jr. (Texas A & M) A FOSSIL POLENT RECORD FROM HINDS CAYE, TEXAS. Fossil pollen records from Hinds Caye can now be integrated into the existing pollen records from southwest Texas to reveal a vegetational record of both stability and change during various periods from 12,000 years ago to the present. The Hinds Caye record differs slightly from the existing pollen records for the area and can be correlated with other data from the shelter pertaining to diet and economic use of plants. The pollen record suggests an early beginning date for the semi-arid vegetational pattern currently found in the Lower Pecos region. (28)

Burns, Bruce A. (see Baker, Larry L.) (6)

Burns, Bruce A. (see Terrell, J. A.) (15)

Busby, Collin L. (California-Berkeley) RECENT ARCHAEOLOGICAL RESEARCH IN SOUTHEASTERN NEVADA: GARDEN AND COAL VALLEY REGION. During the period 1975-77, field parties from the University of California—Berkeley have undertaken a program of archaeological reconnaissance and excavation in Lincoln and Nye counties in southwestern Nevada. Six rock-shelter sites have been excavated and over 70 surface sites recorded. Preliminary results indicate that the site has been used for at least 2000 years. Sites of this research are discussed within the broad frame of both Great Basin and southwestern Nevada prehistory. (5)

Bussey, Stanley D. (New Mexico State) THE SMALL CONTRACT AS RESEARCH. In contrast to the relatively small project—such as a single drilling location or even hundreds of feet of pipeline—has generally considered because of the limited scope and low budgets of such projects. In fact, if proper planning and aesthetics exist, the small
project can be a valuable, if limited, part of a regional research design. The factors that affect the research potential of the small project are attitude, planning, and the ethics of contract archaeology. (39)

Buttigieg-Berman, Mary Jane (New Mexico State) THE SMALL-SCALE SURVEY REPORT: CREATION OF A DATA BASE. The small survey report must accommodate the needs of several audiences. Too often, the requirements of one party overshadow those of contract-based, research-oriented considerations. As a consequence, the small survey report is a poor source of data, and its utility as a research document is nonexistent. This problem can be overcome if the small-scale survey would address itself to questions related to subsistence and settlement behavior. A report format formulated both to provide the necessary data required by the general framework and to yield information needed by those involved in planning and management, is presented. (39)

Byrd, Kathleen M. (LSU) ARCHAEOLOGICAL DATA RELATIVE TO PREHISTORIC SUBSISTENCE IN THE LOWER MISSISSIPPI ALLUVIAL VALLEY. Man has inhabited the Lower Mississippi Valley for at least 12,000 years. During that time he has relied upon many different foods, both wild and domesticated. The types of these foods and their importance has changed through time. Wild plant foods were always present, but the reliance on the tropical cultigens—squash, corn, and beans—increased during the late prehistoric times. Native domesticated plants, for example the sunflower, were also cultivated. Animals played an important role in the prehistoric subsistence, especially larger, common species. The Paleo-Indians relied on the spear to kill their game. The Meso-Indians relied on the atlatl, in addition to the spear. And the Neo-Indians adopted the bow and arrow as well. (48)

Caroutas, Veletta (SIU-Carbondale) UPLAND ARCHAEOLOGY: AN EXAMPLE FROM SOUTHERN ILLINOIS. Data recovered on a reconnaissance survey suggest that hunting and gathering populations occupied the Shawnee Hills in a year-round, seasonal pattern of exploitation. It is expected that the higher density associated with fall resource exploitation is the result of the combined exploitative activities of groups adapted only to the uplands and groups adapted to both the uplands and the bottomlands. The pattern of sustained year-long exploitation of “hill people” has implications for the study of cultural isolates and cultural conservatism. (35)

Caroutas, Veletta (see Gould, F. A.) (35)

Cantwell, Anne Marie E. (Rutgers-Newark) HOPEWELL REDUX: PATTERNS OF CHERT USE DURING THE HAVANA TRADITION. Current explanations of the Hopewell Interaction Sphere stress the exchange of goods, as well as sociotechnic and ideotechnic artifacts and their raw materials, among the participating traditions. However, an analysis of two early Havana Tradition sites in the central Illinois Valley shows that exotic cherts were imported for the manufacture of technicnic artifacts, such as lamellar flake blades, because these cherts possessed the requisite structural qualities lacking in the abundant, coarse-grained, fissiliferous, local cherts. Models for Hopewellian trade should, therefore, be expanded to include the exchange of subsistence related goods. Shifts in chert use in late Havana times are discussed and related to the collapse of the Hopewell Interaction Sphere. (35)

Cas Jens, Laurel (Harvard) APPROACHES TO SITE DISCOVERY. The paper evaluates various archaeological approaches used by the Institute for Conservation Archaeology, Harvard University. Methodology includes surface and subsurface techniques, remote-sensing procedures, and literature research. The statistcal use of such techniques is discussed in relation to current trends in general archaeological theory. Methodology is further evaluated in terms of the efficacy of techniques in resolving the various specific problems of agency-sponsored archaeological projects within a cost-effective framework. (13)

Cassells, E. Steve (Judson College) THE JUDSON COLLEGE SITE: A LATE ARCHAI-C CAMP IN NORTHERN ILLINOIS. Excavation at the Judson College Site, Elgin, Illinois, carried on since the spring of 1976, has revealed a shallow occupation at a date no earlier than 3,000 B.P. The seasonal camp is on a Pleistocene terrace of the Fox River. Associated artifacts include Durst, Steemed and Reddradz side-notched projectile points, other utilitarian camp tools, and large quantities of debitage. A computer study of the debitage is currently underway, seeking to identify flint knapping idiosyncrasies of individual tool makers. (35)

Casteel, Richard W. (Simon Fraser) FEDERAL GOVERNMENT SUPPORT OF ARCHAEOLOGY IN THE UNITED STATES: 1945-1977. The National Park Service continues to be a major source of funding for archaeological research, providing about 3 times the amount of money provided by the National Science Foundation and about 6 times that provided by the National Geographic Society. Nevertheless, this program accounts for only about .00055% of the federal budget. Analysis of the funding patterns indicates that since 1963 there has been a general decrease in the amount of deflated funding available through the National Park Service, and that since 1973 the decrease has been precipitous. Implications of this funding pattern are discussed. (12)

Catchin, Mark (SIU-Carbondale) THE FUNCTION OF LIMITED ACTIVITY SITES IN PREHISTORIC SUBSISTENCE SYSTEMS ON BLACK MESA. Either implicitly or explicitly past archaeological studies have used site assemblages and site locations as indicators of the kind and amount of activities conducted at sites. Both of these indications are explicitly tested in how limited activity sites functioned in prehistoric subsistence systems in the highlands of Black Mesa. (22)

Chase, Phil G. (Arizona State) QUANTITATIVE INFERENCES BASED ON POTTERY FRAGMENTS. A specially made sample of pottery was used to experimentally test the validity of the use of sherd counts and various alternatives for archaeological inference. Sherd counts proved unreliable, but three alternative methods appear to be statistically valid. (15)

Christenson, Andrew L. (UCLA) EXPLAINING CHANGES IN THE FOOD NICHE OF HUMAN POPULATIONS. Unlike many other animals, man is able to make radical and permanent changes in his food niche. Such changes are the result of decisions about food procurement and consumption. In this paper, major changes in the weight of the human food niche (e.g., the broad spectrum revolution) are explained using an optimization model developed by Earle and Chris- tenson. Current ecological models of foraging behavior and optimal diet are also considered. (38)

Clark, G. A. (Arizona State) THE LA RIERA PALEOECOLOGICAL PROJECT (ASTURIAS, SPAIN): AIMS AND PRELIMINARY RESULTS. Excavations at the stratified cave site of La Riera are central to an understanding of interregional variability in human adaptation to the Cantabrian zone during the late Pleistocene and Holocene (20,000-6,000 B.P.). Preliminary results document the presence of dense "living floors" with associated features, (2) patterns of lithic and bone artifact variability that cut across traditional culture-stratific units, (3) marked variation in the incidence of faunal debris categories (body parts), suggesting differential treat- ment of different species and variation through time linked to shifts in site function, (4) a long-term exploitation of shell-fish, and (5) evidence for major late/Post-Pleistocene climatic changes. (34)

Cohen, Mark N. (SUNY-Plattsburgh) CARRYING CAPACITY, PERIODIC RESOURCE FAILURE, AND THE REGULATION OF PLEISTOCENE POPULATIONS: A CRITIQUE OF SOME RECENT MODELS. Ethnographic data suggest that the impact of environmental fluctuations on human populations is governed by socio-political variables affecting a group's ability to adjust to environmental change. Archaeological data suggest that early Pleistocene societies were well buffered against periodic shortages, Famine is probably a recent phenomenon among hunter-gatherers. The importance of crises in calculating carrying capacity and their importance as population limiting devices in the Pleistocene have both been overlooked in the recent literature. The data also point to the importance of socio-political homeostatic devices in the late Pleistocene may explain the emergence of trade in luxury goods as a means of regenerating homeostatic social networks. (38)

Cone, Gerald (Wisconsin-Milwaukee) COMPUTER AIDED ANALYSIS OF CERAMICS FROM THE PUEBLA PRECLASSIC PROJECT. In recent years the Puebla Preclassic Project has recovered well over 100,000 ceramic artifacts from intensive site survey and from test excavations of five sites. We suggest that the span represented by these ceramic artifacts covers the preclassic period to the Late Classic period. It was decided beforehand that only that cursory subjective typology would be attempted in the field, and that a computer aided analysis would be done at the University of Wisconsin-Milwaukee. All sherds were coded for computer aided analysis. The analysis is now in progress and some methods and results will be discussed. (40)

Conklin, William J. (Institute of Andean Studies) MIDDLE HORIZON TEXTILE TECHNIQUES. The characteristic structural forms of the Middle Horizon are reviewed, with particular emphasis on the characteristic dye colors utilized by different cultures during this time period. These established diagnostically then permit a review of a textile fragment, found by Max Uhle at Huaca del Sol, that has been attributed to the Huari Culture. (4)

Connors, Deborah T. (see, Skinnos, S.A.) (18)

Cooke, Richard G. (Smithsonian Tropical Research Institute) THE WHITE-TAILED DEER IN PREHISTORIC PANAMA: AN HYPOTHESIS FOR THE MANIPULATION OF WILD POPULATIONS IN
THE NEOTROPICS. Following the demise of the Pleistocene mega fauna, the largest palatable terrestrial mammals that were available to the prehistoric inhabitants of Central America were the tapir, the white-lipped peccary, and the white-tailed deer. While the tapir and peccary require heavily forested habitats and rapidly move off in the face of human pressure, the last named is well-known to thrive in disturbed, man-made habitats and to be able to resist heavy and constant hunting and exploitation of its range. In Central Panama (Coinel), where the population of hunters-gatherers and, later, sedentary agriculturalists increased rapidly from about 5000 B.C. to 1500 A.D., evidence from archaeological middens and ethnohistoric sources indicates that the white-tailed deer was exploited extensively and in similar proportions throughout this period, without a significant decline. An hypothesis is presented for the artificial manipulation of the white-tailed deer in this area, and some theories regarding the lack of domestication in the Neotropics are considered in light of this evidence. (32)

Coombs, Gary (California-Santa Barbara) DECISION THEORY AND SUBSISTENCE STRATEGIES: SOME THEORETICAL CONSIDERATIONS. There has been considerable debate concerning the utility of Mathematical Decision Theory, which includes Game Theory, as a framework for understanding the specific subsistence strategies adopted by various human populations. Model analysis of this debate revolves around the following two related questions: (1) whether or not it is acceptable to treat the environment as a rational adversary, and (2) whether or not it is useful to approach problems involving population behavior from the level of the individual. This paper attempts to demonstrate that regardless of the answers to these questions, Decision Theory provides a number of valuable insights into the study of human subsistence behavior. (5)

Coulson, Sheila (see Flakta, C. S.) (34)

Covert, Herbert H. (see Seck, Susan M.) (5)

Cowan, C. Wesley (see Ford, R. I.) (22)

Curran, Margaret (Purdue) AN EXAMINATION OF THE RELATIONSHIPS BETWEEN AGRICULTURAL PRODUCTIVITY AND POPULATION DENSITIES USING SATELLITE DATA. According to some theorists, population pressure on agricultural resources is a major factor in the evolution of complex societies, but to date no researcher has been able to demonstrate this empirically. This paper addresses this problem and revolves around two related questions: (1) whether or not it is acceptable to treat the environment as a rational adversary, and (2) whether or not it is useful to approach problems involving population behavior from the level of the individual. This paper attempts to demonstrate that regardless of the answers to these questions, Decision Theory provides a number of valuable insights into the study of human subsistence behavior. (29)

D’Alroy, Terence N. (UCLA) THE EFFECTS OF INCA EXPANSION IN THE UPPER MANTARO PERU. This paper examines the Incas militaristic expansion and incorporation of the Upper Mantaro region in the Central Highlands of Peru. During the Late Intermediate Period, just prior to incorporation, the Mantaro region was characterized by hierarchical social organization and interregional warfare. Data derived from the preliminary stage of a regional research project, using intensive surface collection, site mapping, and limited excavations, address the following issues: (1) the social structure of the Incas and the impact of incorporation on the local society; and (2) the effects on local social and economic organization of an imposed tax system. (23)

Davidson, Howard M. (Arizona State Museum) AN EXAMPLE OF MULTI-STAGE RESEARCH WITHIN A CULTURAL RESOURCE MANAGEMENT FRAMEWORK. The Arizona State Museum has investigated 183 km of transmission line corridor and ancillary facilities such as power generating stations and access roads for a southeastern Arizona utility. Multi-stage research conducted within a cultural resource management framework identified 116 archaeological features, which were then subjected to intensive data recovery. As part of the project, design and construction phases for the various facilities surveyed, the Museum was able to integrate research methodology, resource identification, mitigation recommendation, and systematic data recovery stages into the contractor's schedule. Flexibility on the part of both institutions facilitated engineering and research revisions. Project management and research aspects were presented and evaluated. (12)

Davidson, Howard M. (see Dickerson, J. L.) (19)

Davidson, Howard M. (see Kosakowsky, L.) (25)

Davis, Emma Lou (Great Basin Foundation) USE OF TETHERED BALLOON PHOTOGRAPHY FOR ANALYZING PALEOAMERICAN SITES: A CHINESE EXAMPLE. Correlations of aerial photography with "ground truth" require use of numerous media. Judicious combinations will supply both large overviews and also precise measurements. Both are essential for interpreting prehistory in the context of changing environments. Use of a tethered balloon as camera platform is described as an ideal medium for documenting ground truth at intermediate altitudes from 5 to 300 meters above terrain. Balloon based pictorial sequences fill a gap between satellite photos, high altitude stereo pairs, and precise, ground measurements mapped on a plan table. (11)

Deeds, Eric E. (see Kus, J. S.) (17)

Deevey, Edward S. (Florida State Museum) CLASSIC MAYA IMPACT ON A LACUSTRIAN ENVIRONMENT. Phosphorus fluxes from watershed to closed lake sediments allow evaluation of the impact of the Classic Maya on the lacustrine ecosystem of the X'ochitl and Zacapu basins, Guatemala and the X'ochitl and Zacapu basins, Guatemala. Preliminary evidence suggests that the lacustrine environment, measured as net output to sediments, was sharply accelerated by human exploitation, more sharply in the X'ochitl basin. As a result of the lacustrine evidence, the study was extended to examine the relationship between environmental change and the chronology of Classic Maya activity. (10)

Dekin, Albert A. (SUNY-Binghamton) SPATIAL THEORY AND THE EFFECTIVENESS OF SITE EXAMINATION IN THE NORTHEAST. For the last year, we have worked to provide an empirical base for maximizing inferences from minimal data on site character and content. We have evaluated several categories of test data to several modelized site data and determined and to test mathematical models that interrelate them. While these approaches have resulted in cost-effective techniques, they have raised several questions of spatial theory and the assumptions that underlie traditional approaches to site examination and evaluation. This paper briefly examines several of these problems as necessary theoretical background to further discussions of research methodology. (13)

Del Bene, Terry (Connecticut) MICRO-DISTRIBUTIONAL ANALYSIS IN THE EXAMINATION OF LITHIC ACTIVITY. An experiment has been performed in order to explicate the systems operant on the production of archaeological proveniences within the context of stone tool manufacture. An experienced knapper produced a series of tools, unaware that such an experiment was taking place; the tools were then removed and a 100% recovery excavation was undertaken. The entire matrix was then separated into a series of 3 cm by 2.5 cm samples. Both macro and micro distributional analysis was accomplished using the trend surface analysis option of the SYMAPM mapping program. (19)

DePratt, C.J. (Georgia) ARCHAEOLOGICAL IMPLICATIONS OF HOLOCENE GEOMORPHOLOGIC AND EUSTATIC CHANGES ON THE GEORGIA COAST. Distribution of archaeological sites on Holocene portions of the Georgia (U.S.) coast permits delineation of six shoreline positions dating between 4500 and 100 years before present. Patterns of shoreline progradation and retreat indicate that configuration of the Georgia coast is the result of alternating cycles of deposition and erosion over the last 4500 years. Previously unrecorded fluctuations of sea level were also detected. Such changes would have resulted in widespread shifts in the environmental setting of prehistoric populations. Implications for settlement and subsistence studies in dynamic coastal areas are discussed. (48)

Deraga, D. (see Winter, M.) (49)

DePratt, Chester B. (Georgia) ARCHAEOLOGICAL IMPLICATIONS OF HOLOCENE GEOMORPHOLOGIC AND EUSTATIC CHANGES ON THE GEORGIA COAST. Distribution of archaeological sites on Holocene portions of the Georgia (U.S.) coast permits delineation of six shoreline positions dating between 4500 and 100 years before present. Patterns of shoreline progradation and retreat indicate that configuration of the Georgia coast is the result of alternating cycles of deposition and erosion over the last 4500 years. Previously unrecorded fluctuations of sea level were also detected. Such changes would have resulted in widespread shifts in the environmental setting of prehistoric populations. Implications for settlement and subsistence studies in dynamic coastal areas are discussed. (48)

Dering, Phil (Texas A&M) POLLEN AND PLANT MACROFOSSILS FROM HINDS CANYON, SOUTHWEST TEXAS. An analysis of plant macrofossils from a dry rockshelter in southwest Texas is presented. The results of the analysis are used to describe prehistoric utilization of plant resources and to infer prehistoric vegetation that occurred in the area. Since the lower deposits of the shelter have been radiocarbon dated to 11,000 B.P., the study represents the longest plant macrofossil and pollen record to be reported from southwest Texas. (28)

Dering, Phil (see Bryant, V.M.; Jr) (28)

Deutchman, Harriett L. (SIU-Carbondale) THE DISTRIBUTION OF TUSAYAN WHITE WARE AMONG THE KAYENTA ANASAZI. Sosi Black-on-white and Dogoshki Black-on-white co-occur at many Kayenta Anasazi sites. An elemental and trace element analysis of these two types from Black Mesa, Arizona, and surrounding areas is designed to define the range of paste compositional variability of these two types. It is suggested that there exist chemical and mineral differences between the ceramics from Black Mesa and its neighboring region. Alternative patterns of prehistoric raw resource procurement and the subsequent redistribution of pottery among these local prehistoric communities will be discussed. (21)
Dibble, David S. (Texas-Austin) THE INFIERNAL PHASE: EVIDENCE FOR A LATE OCCUPATION IN THE LOWER PECOS RIVER REGION, TEXAS. Direct archaeological evidence of late prehistoric occupation in the lower Pecos-Devils River drainages (roughly contemporaneous with the present northeastern Chihuahuan Desert margin) has been limited. Most of the data available from the region are interpreted as indicating general continuity in adaptive patterning through middle-to-late prehistoric times. Recently, however, an extensive site in the lower Pecos valley has been briefly investigated and is hypothecated to reflect a late prehistoric occupation in the region by hunting groups of significant size; further, a hypothesis regarding a late period intru-
dition into the area by Athabascan speakers is presented on the basis of the new archaeological evidence. (35)

Dibble, Harold L. (Arizona) PATTERNS OF SHAPE IN FLAKES FROM THE TABUN CAVE, IS-RAEL. Samples of complete, unretouched flakes from the Middle and Lower Paleolithic industries of Tabûn are examined with respect to a number of quantitative attributes, while main-
taining stratigraphic as well as technological controls. The temporal differences observed in these variables suggest that considerations of function and style alone are not enough to explain Paleolithic industrial variability, and instead such differences may be in part to differential capabilities of evolving hominid groups. (44)

Dickens, Roy S., Jr. (Georgia State) PROBLEMS AND PROMISES OF URBAN ARCHAEOLOGI-
CAL SURVEYS: THE MARTA PROJECT. The urban setting presents a variety of problems in the execution of archaeological surveys and assessments, while it also provides a promising and perhaps unique set of resources. Using the MARTA (Metropolitan Atlanta Rapid Transit Au-
thority) Archaeological Project as an example, this paper describes and evaluates some of the techniques developed for survey in a large urban center. Sampling, testing, recording, and mitigation procedures are discussed. Potential theoretical uses of the urban archaeological resource are also considered, with an emphasis on pattern delineation, processual studies, and hypothesis testing. (7)

Dickerson, Jeanette L. (Arizona State Museum) A MULTISTAGE LITHIC ANALYSIS OF MATER-
IALS FROM SOUTHEASTERN ARIZONA. Archaeological data recovery in southeastern Arizona resulted in the collection of chipped stone artifacts from thirty-five sites. Formal attributes of artifacts were quantified and subjected to computerized statistical analyses in an attempt to achieve the following goals: (1) thorough description of lithics, (2) identification of technological and cultural traditions, and (3) identification of variability in aboriginal land use. Microwear and replicative studies further elucidated lithic variability. As a result of the multistage analyses, formal variation within and between samples was summarized, and explanations for such variation offered in the form of temporal, cultural, and resource differences. (19)

Dickson, Bruce (Texas A & M) TIKAL MILPA AGRICULTURE AND POPULATION: A SIMU-
LATION. Archaeological estimates of the size of the prehistoric sustaining area and the popu-
lation of the Classic Maya site of Tikal are reviewed. A computer simulation of the productivity of the presumed Tikal-sustaining area is made using data on corn yields, fallow cycles, acreage requirements, and per capita corn consumption collected among modern Maya milperos in the Peten. A large discrepancy is found to exist between the magnitude of the population estimated for Tikal and the number of people who could have been supported in its sustaining area. North milpa agriculture had been the main prehistoric subsistence strategy practiced there. Alternatives or supplemental food-energy sources are noted. (27)

Diggs, Robert D. (North Central Arizona) PREHISTORIC EXPLOITATION OF A MICROENVIRONMENT IN EASTERN ARIZONA. The following report represents the preliminary study of the Hall Ranch locality in eastern Arizona, located 11 miles north of Springerville, Arizona on the ranch of Mr. and Mrs. Ralph Tuckness. Three occupations are represented: (1) Archaic, (2) Pueblo-Mogollon between A.D. 700 and 900, and (3) Pueblo-Mogollon between A.D. 1050 and 1100. The site is coastal and the occupations represent the phases that occupied the locality and how the locality was utilized by the prehistoric occupations. (38)

Dincauze, Dena F. (Massachusetts-Amherst) PREDICTING RELATIVE SITE DENSITIES: TWO TECHNIQUES FOR LANDSCAPE ANALYSIS. This paper reports on complementary methods that show considerable potential for reliable prediction of relative site densities in advance of field investigations. First, data on soil permeability and surface slope, which have proven to be a sound basis for stratifying terrain into units that can be ranked for probability of site encounter. At a larger scale, stream basins ranked by the Strahler method display positive but less clear-cut relationships with preserved site frequencies per stream unit length. These predictive methods promise greatly increased efficiencies over random survey activities in the selection of search methods appropriate to different kinds of terrain. (13)

DiPeso, Charles C. (Amherst Foundation) THE HOHOKAM AND THE OOTAM. For two decades DiPeso has proposed that the Upper Piipa and Papago of Pimeria Alta were part of an older Ootam cultural continuum going back to a common Indigenous Cochise Culture origin. This concept involves a culture conquest model with groups of indigenous Chichimecanic folk at various points in time and space acting as alien or donor cultures such as the Hohokam. This position permits archaeologists to separate physical traits and attributes of indigenous groups from those of alien groups in order to trace artifact designs in terms of such cultural parameters as time and space and to reconstruct local history. (9)

Dodge, William A. (Chicago) ARCHAEOLOGICAL INVESTIGATIONS AT KYAKIMA, ZUNI INDIAN RESERVATION. An archaeological survey of the area around the historic Zuni village of Kyakima was recently conducted by the Zuni Archaelogical Enterprise. The team isolated features recorded suggest an earlier (12th century) occupation, as well as utilization of the area as a "refuge" site during the Pueblo Revolt, following the primary occupation of Kyakima. The recorded sites are described and the environmental setting, "cultural history," and archaeological resource are discussed. The settlement of the survey area is compared with regional patterns of site settlement and type, with particular attention given to the historic village and "refuge period" sites. (45)

Dominguez Chavez, Humberto (INAH) LOS PETROGLIFOS DEL CERRO SAN RAFAEL COAHUL-
EA, UN MODELO DE INVESTIGACION. El estudio arqueologico en la Comarca Lagunera se ha centrado en las montanas, pero hoy, con las numerosas excavaciones, su sitio ha recibido la atenci6n adecuada. En este caso, la investigaci6n en el "Cerro San Rafael Coahuila", que presenta abundancia de petroglifos, se puede considerar como el centro del desarrollo de la cultura. Se presenta una ficha de cataloga-
cion y un esquema de pinturas. (35)

Douglas, Charles L. (Nevada-Las Vegas) TEMPORAL VARIABILITY IN FAunal PROCUREMENT ON BLACK MESA. The results of analyses of faunal remains from sites excavated during the past year on Black Mesa are summarized. Temporal variability in prehistoric faunal proc-
urement is described and hypotheses are presented to explain this variability. (22)

Douglass, John G. (BLM Arizona State Office) THE ACADEMICIAN'S IDEAL AND THE BUREAU-
CRAT'S PRACTICAL: WHO WINS WHEN LEGAL COMPLIANCE, BUDGET, AND TIME ARE CON-
TROLLING? However disturbing the prospect, land managing agencies frequently must move forward with fewer of the technical and logistical tools than desired in meeting field work needs, needs imposed for purposes other than "research." A principal challenge in both the practical and management orientations simultaneously, in the absence of agreed-upon standards, is, to judge the orderly, efficient, and effective use of the limited time. This paper reviews requirements and conditions under which BLM has undertaken very limited site surveys on some 50 acres since mid-1976, and invites the academic side of the profession to accept that not all meaningful archaeological need follow the pure research paradigm. (48)

Doughty, Mary Lee (Southwest Missouri) USE OF SPSS FACTOR IN LITHIC ANALYSIS. Analysis of SPSS factor of lithic artifacts, including work distribution, from a series of site surveys in North Carolina Valley, Texas, demonstrates significant intra- and inter-site uniformity in manufacturing attributes and, through this, uniformity in methods of exploitation of the local lithic resource, chert. This degree of uniformity, not evident from traditional typological or archaeological analysis, relates to the more general history of resource utilization in the area. (19)

Doyel, David E. (Arizona State Museum) HOHOKAM SOCIAL ORGANIZATION AND THE SEDEN-
TARY TO CLASSIC TRANSITION. Numerous alternative reconstructions exist regarding the na-
ture of Hohokam social organization. Several possible models exist, including the complexity of Ho-
hokam society. This paper presents a number of the groups that occupied the locality and how and when it was used by the prehistoric occupations. (38)

Drager, Dwight L. (NPS) AUTOMATED DATA PROCESSING OF DIGITAL AERIAL IMAGERY IN CULTURAL RESOURCES SURVEY. The advent of large area cultural resource surveys has dem-
onstrated the impracticality of ground-based techniques for mapping environmental variables in preparation for archaeological survey of sample units. This paper will discuss photographic denotability as it applies to image processing, digitalization, and multispectral data. The factors that affect photo densities will be pointed out, as well as methods for acquiring data. Once obtained,
digital data can be processed to aid cultural resource managers with such things as the preparation of sampling procedures, environmental maps, site location, site mapping, and other aspects, all of which will be discussed. (24)

Drellinger, LaMar (Archaeological-Environmental Research Corporation) HISTORIC RESEARCH AND THE CULTURAL RESOURCES SURVEY. The paper, in three parts, will concentrate on the role that historical research can play in large-scale cultural resource surveys. The first segment will be devoted to the methods employed and problems encountered in the data collection and analysis aspects of cultural resource records. The second part will concern the conflict between the disciplines of archaeology and history; as they arise during the conduct of cultural resource inventories, will then be investigated. The final section of the paper will summarize the major aspects of this research and present suggestions for the future integration of the archaeology and history in future cultural resource survey projects. (20)

Duncan, Jack W. (Florida Department of Criminal Law Enforcement) SEARCH TECHNIQUES: BURIED BODIES. The search for and recovery of buried bodies is the responsibility of law enforcement officials. Search techniques utilized to locate a suspected grave must be implemented with the same care and precision as those techniques used in any crime scene search. Since no two crime scenes are alike, search techniques must be modified from time to time to allow maximum effect in locating a suspected grave. Collection and preservation of physical evidence must be incorporated into techniques used for locating possible burial sites. This paper will address search techniques used in locating buried bodies and emphasize the importance of proper physical evidence collection procedures. (31)

Durand, Stephen R. (see Baker, L. L.)(6)

Dutton, Bertha P. (New Mexico) AN OVERVIEW OF THE GALISTEO ARCHAEOLOGY. At the 50th anniversary of the Pecos Conference, at Pecos Pueblo ruin, a session was devoted to "The Rio Grande Perspectives from its Periphery." Afterward, one who attended the original conference remarked: "I thought the Rio Grande was a 'squeezed lemon.' That session told me it wasn't so!" One small area, the Galisteo Basin south of Santa Fe, has come to be viewed as an excellent sample of the Grand Anasazi culture. Although the evidence is true in part, other important factors must be considered. This paper will set forth evidence of non-Anasazi features of the Galisteo culture area, with a view to better establishing its place in archaeological history. (37)

Earle, Timothy K. (UCLA) A MODEL OF SUBSISTENCE CHANGE. This paper presents a preliminary model to explain how subsistence producers choose among the procurement strategies available to them and how this selection process can result in changes to their subsistence economies. The model is derived from microeconomics and emphasizes the importance of marginal household and the variable component of labor in decision-making. The model is meant as a coherent, although certainly incomplete, explanation of prehistoric economic change. Its relevance for understanding such important processes as the broad spectrum revolution and the shift to agriculture is discussed. (36)

Earle, Timothy K. (see D'Altroy, T. N.)(23)

Ebert, James I. (NPS) REMOTE SENSING AND LARGE-SCALE CULTURAL RESOURCES MANAGEMENT. Recent trends in cultural resources management, including increasingly large areas to be surveyed and ever-greater concern with reducing the destruction of cultural resources by archaeologists as well as the public, require that new methods of planning, assessment, monitoring, and control be developed and applied nationwide. One domain of such methods is remote sensing, which can increase efficiency, save data and data storage space at the stages of archaeological research. Remote sensing methods which will revolutionize cultural resources management in the near future will be discussed in the context of the National Park Service assessment of 23,000,000-acre NPRA, North Slope, Alaska. (24)

Eckles, David G. (SIU-Carbondale) EXPLANATION OF INTERSITE VARIABILITY IN FAUNAL REMAINS FROM SITES ON BLACK MESA. At present, there appears to be a change through time in the composition of large animal exploitation on Black Mesa in the form of increasing the smaller animals and decreasing numbers of large animals, and a change in settlement pattern toward increasing use of upland areas. An attempt is made to test the hypothesis that the variability in the frequency of faunal remains is not related to temporal changes in settlement pattern. (22)

Eddy, Frank W. (see Huse, H.)(45)

Effland, Richard W., Jr. (Arizona State) A SPATIAL ANALYSIS OF KAYENTA ANASAZI OCCUPATION OF THE INNER GRAND CANYON. Kayenta Anasazi occupation of the Inner Grand Canyon will be analyzed from a spatial perspective. Concepts related to spatial and population processes will be used to describe the spatial pattern of sites within the canyon. Comparisons with other Kayenta Anasazi areas will be made on the basis of pattern, spacing, dispersion, agglomeration, and other characteristics. An effort to identify patterns of spatial behavior for Kayenta Anasazi populations will be made. (38)

Eighmy, Jeffrey (Colorado State) RECENT ARCHAEOLOGICAL SURVEY OF THE SOUTHWEST. Based on preliminary analysis of 28 archeological samples collected in Arizona and New Mexico, questions concerning the validity of the waters are raised. Although we were able to reproduce the high level of collection accuracy (i.e., alpha 95% 3°), dating was still ambiguous. Often good samples did not plot near the curve, and in others the position did not agree well with archeological context information about expected dates. Solving these problems requires more detailed information about how the original curve was constructed, calibrated, and interpreted. (6)

Elsig, Gary (see Grange, Roger T.)(7)

Elston, Robert (Nevada-Reno) MEDITHERMAL CLIMATIC VARIATION AND CULTURE CHANGE ON THE EASTERN SIERRA FRONT. Recent studies provide support for the hypothesis that the Martis and Kings Beach complexes represent different adaptations to climatic variation. Neglecting the Martis times (4,000-2,000 B.P.) resulted in a relatively high regional carrying capacity that allowed social organization at the band level, craft specialization, nucleated winter village sites, regular use of favored base camps, and a territorial oriented subsistence strategy. Since about 2,000 B.P. the regional carrying capacity has been relatively low, requiring means of adaptation recorded for the Washoe: a dispersed subsistence strategy, a nonnucleated settlement pattern, and a level of social organization between the family and the composite band. (5)

Emslie, Steven D. (Prescott Center) AN ETHNOBIOLOGICAL STUDY OF THE AVIFAUNA OF POTTERY MOUND. Pottery Mound is a large Pueblo IV ruin located in the Puerco River Valley south west of Albuquerque, New Mexico. A large number of bird bones recovered during the excavations of this site by the University of New Mexico were submitted to Dr. Lynden L. Hargrave for analysis. Identification of this bone was not possible until a research grant was received from the Max C. Fiedschmann Foundation, through the Prescott Center, allowing Dr. Hargrave to hire a research assistant. Results of this analysis and relations of the birds identified with the preserved murals at the site provide some interesting correlations on the use of birds by the prehistoric Indians. (47)

Eriason, Jonathan E. (Los Angeles County Museum of Art) DIACHRONIC CHANGE OF THREE EXCHANGE SYSTEMS AS VIEWED THROUGH OBSESSION PRODUCTION. These interrelated exchange systems are viewed through changes in the rate of obsidian production. Surface sampling, computer graphics, and lithic analysis were used to describe quarry production sites. Recent advances in obsidian hydration dating provided the means to determine the rate of production at these sites. Although production analysis does provide an important technique for studying aspects of regional exchange, there are still many problems that need to be resolved. (33)

Euler, Robert C. (see Effland, R. W., Jr.)(38)

Evans, David R. (Missouri-Columbia) LOCATING SITES IN EAST-CENTRAL MISSOURI: PROBLEMS AND SOLUTIONS. The Meramec Archaeological Project has recently completed a GIS-based project to locate archaeological sites. These techniques include: traditional pedestrian survey, transect plowing, shovel testing, and magnetometric and prospector. The efficacy of these techniques ranged from highly useful to useless, with some of the more current and popular techniques at the lower end of the scale. Comparisons are drawn as a basis for various kinds of costs and the applicability of specific techniques to specific terrain conditions. Recommendations are made as to the utility of the various techniques and the necessity of additional comparative programs. (13)

Evans, Susan T. (Pennsylvania State) A STRUCTURAL ANALYSIS OF CENTRAL PLACE DEVELOPMENT IN THE VALLEY OF MEXICO. The evolution of central place systems in the Valley of Mexico is analyzed from a diachronic perspective, from the Early Horizon to the Spanish conquest. The method used is the recently developed exploratory framework of Q-analysis, a "lath-structure of drainage" written in algebraic topology, specifying binary relations between sets of variables. The structures describing these relations can be interpreted as a set of polyhedra, whose vertices correspond to the settlements themselves, or to variables under study. Comparisons of evaluating various site-locating techniques for representing states of the Mexican settlement system over time, allows determination of the forces producing structural change. (40)
Fankhauser, B. (see Tuggle, H. D.) (14)
Feder, Kenneth (see Del Bene, Terry) (19)
Fehr, R. T. (see Sutro, L. S.) (36)

Feinman, Gary (CUNY) THE EFFECTS OF A CHANGING ADMINISTRATIVE ORGANIZATION ON CERAMIC PRODUCTION WITHIN THE PREHISPANIC VALLEY OF OAXACA. A diachronic model for explanation of changing strategies of ceramic production within the prehispanic Valley of Oaxaca is outlined. A series of hypotheses is then proposed in order to support or refute this model. Methods of locational analysis are used to test these hypotheses concerned with diachronic shifts in regional settlement pattern while simple statistical techniques are utilized to test the hypotheses concerned with spatial and temporal variability within the ceramic data set. A diachronic relationship between administrative organization and ceramic production is shown to exist and several interpretive implications of this relationship outside the Valley of Oaxaca are suggested. (29)

Feldman, Lawrence H. (Missouri-Columbia) SNAILS, CLAMS AND MAYAS: THE USE OF MOLLUSKS TO MEASURE ECOLOGICAL CHANGE. Changes in agricultural practices may be determined from percentages of different molluscan remains found in archaeological phases. In Belize, a uniquely long sequence allows one to trace these changes from the Early Preclassic into the Postclassic, a sequence more than 3,000 years long. Comments are made on swiddening, tree crops, intensive land utilization and the Corozal sample is compared with data from the Peten and elsewhere in the Mayan area. (10)

Ferguson, T. J. (Zuni Archaeological Enterprise) THE GROWTH OF ZUNI PUEBLO. The growth of Zuni Pueblo is discussed in terms of architecture, village layout, and the formation processes of the archaeological record. A short architectural history of the pueblo is presented. Formation processes identified during recent archaeological monitoring of the construction of a new water system in the pueblo are discussed. (45)

Ferguson, T. J. (see Dodge, W. A.) (45)
Ferguson, T. J. (see Mills, B. J.) (45)

Fernandez, R. (see Winter, M.) (49)

Fesperman, Pamela R. (Florida State) NON-HUMAN BONE ALTERATION AND SCATTER PATTERNS. During criminal investigations it is often necessary to determine whether the position of bone fragments is the result of a criminal act or natural cause. Moreover, bone damage, when observed, also needs to be determined as being naturally or criminally inflicted. Experimentation to clarify these problems was conducted using domestic and wild animals familiar to the northwest Florida area. The results of this study indicate that different animal species alter bones and scatter them in unique ways. (31)

Fesperman, Pamela R. (see Karwedsky, R. A.) (46)

Findlow, Frank J. (Columbia) PREHISTORIC OBsidIAN USE IN SOUTHWESTERN NEW MEXICO. Local and regional aspects of prehistoric obsidian procurement are analyzed using Anima phase data from southwestern New Mexico. The initial results of this study suggest that a dual system involving both direct and indirect procurement was in use throughout the area. The implications of such a dual system for the understanding of lithic raw materials use throughout southwestern New Mexico are discussed. (33)

Finsten, Laura (Calgary) THE CLASSIC-PRECLASSIC TRANSITION IN THE VALLEY OF OAXACA, MEXICO. Settlement pattern shifts following the abandonment of the Main Plaza at Monte Albán have been analyzed. The classicized preclassical system of the Late Classic collapsed and was replaced by a more decentralized mode of regional organization. The nature of this Early Postclassical settlement system is elucidated by the analysis of the distribution and internal organization of the major centers. (29)

Fisch, Eva (CUNY) DISCONTINUOUS SITE SIZE HIERARCHIES IN FORMATIVE MESOAMERICA. Discontinuous site size hierarchies are the rule in most ancient Formative Mesoamerican societies. One site can represent as much as three-fourths of the population of any one region. This paper presents a model derived from locational theory to account for the existence of discontinuous, two level settlement hierarchies with impressively large sites in the Early and Middle Formative. The model is evaluated with data from the Valley of Oaxaca, Mexico. (29)

Fish, Paul (Georgia) BEYOND TOOLS: DEBITAGE ANALYSIS AND CULTURAL INFERENCES IN THE MIDDLE PALEOLITHIC. Debitage has received cursory treatment in most Paleolithic artifact analyses and interpretations related to debitage usually have been restricted to the narrowest technological levels. In order to document the potential of debitage analysis for various types of cultural inference, data from several Middle Paleolithic sites (Oazeh, Tabun, Combe Gené, Peche de l'Aze, and Corbiac) are cited. For example, selective processes in tool use and manufacture in single sites are inferred from the kinds and distributions of debitage. Debitage is also utilized to provide insight into a range of questions of archaeological interest such as activity location and chronology. (34)

Fish, Paul R. (see Pilles, Peter) (8)

Fish, Suzanne K. (Georgia) PALYNOLOGY OF EDZNA AND AQUACATL: ENVIRONMENT AND ECONOMY. A series of pollen samples from archaeological contexts at the site of Edzna, Campeche are used to interpret prehistoric environmental conditions and cultural practices. Interpretations are made in the light of an examination of modern surface spectra from the environs of the site. The series from Edzna will be compared with a smaller series from Aculatl. (10)

Flitaker, Catherine S. (Chicago) MOUSTERIAN FACIES IN ENGLAND AND IN MEDITERRANEAN SPAIN. This paper deals with a re-examination of the "Bordesian" Mousterian facies in the light of major differences found between collections in England and in Mediterranean Spain. Only the Mousterian of Acheulean Tradition and Quina facies are represented in England, whereas only Denticulate and sidescraper-enriched Typical facies have been found in eastern and southern Spain. Environmental, stylistic, and other information are discussed in an effort to explain the major differences in "facies" representation between these two areas. (34)

Ford, Richard I. (Michigan) THE SIGNIFICANCE OF ARCHAEOLOGICAL PLANT REMAINS FOR INTERPRETING PREHISTORIC ADAPTATIONS ON BLACK MESA. More than 6,000 flotation samples from archaeological sites on Black Mesa have been analyzed. The results support the basic proposition that corn agriculture and the resulting plant community transformations associated with its technology increased the useful plant biomass on the useful plant biomass. Concomitantly, an increased population and reduction in alternative resources resulted in a fragile ecosystem that was progressively degraded. Plant evidence includes charcoal, cuticles, and seeds from a variety of indigenous plants. (22)

Fowler, Melvin L. (Wisconsin-Milwaukee) PRE-HISPANIC LITHIC INDUSTRIES IN THE PUEBLA VALLEY. A variety of lithic materials have been recovered by the Puebla Preclassic Project (1975-77) from intensive controlled surface survey and from test excavations. The items recovered through this method will be described and analyzed in terms of the following factors: (1) the type and range of variation of the raw material from which the artifacts were manufactured, (2) the tool types that these specimens represent, (3) the identification of the source of raw materials, and (4) the kind of technology that each represents. (49)

Francis, Julie E. (Arizona State) THE EFFECT OF CASUAL COLLECTION OF BEHAVIORAL INTERPRETATIONS OF ARCHAEOLOGICAL DATA. The amount and quality of information that can be gained through the systematic collection of surface remains is of great concern to archaeologists undertaking regional surface surveys. Under field conditions, the kinds and dispersal of materials found on the surface of the site will reflect not only the behavior of the prehistoric occupants, but the site's erosional and depositional history, as well as human action subsequent to the original deposition of the site such as casual removal of materials from site surfaces. This paper presents a method for the evaluation of casual surface collections from site surfaces of 23 sites recorded during the 1976 survey of the Little Colorado Planning Unit. (6)

Freeman, L. G. (Chicago) THE GARBAGE SHALL RISE AGAIN: STONES, BONES, CHARCOAL AND SEEDS FROM MOUSTERIAN LEVELS AT ABRIC AGUT (BARCELONA, SPAIN). During 1976, excavations at the small shell mound called Abric Agut near Barcelona, Spain were carried out as part of a regional project jointly directed by Freeman, E. Ripoll, and H. de Lumley, revealed several intact levels containing Mousterian artifact assemblages, all apparently assignable to a regional variant of the Denticulate facies. By means of simple water flotation, charcoal from several deciduous and coniferous tree species was recovered from these levels. One occupation yielded artifacts. We believe we are food remains. This is, as far as we know, the first time vegetal food remains have been recovered by flotation from Mousterian deposits in Europe. (34)

Freimuth, Glen (Illinois) X-RAY FLUORESCENCE ANALYSIS OF CERTAIN MIDWEST CHERTS. In cooperation with the Illinois State Geological Survey, the analysis of known and suspected prehistoric quarries in and near Illinois has been initiated to provide both identification methods
and usable data. The results of x-ray fluorescence analysis are presented as a feasible means of chart source identification. (43)

Friedman, Janet (USDA Forest Service) PREHISTORY IN HELL'S CANYON NATIONAL RECREATION AREA. Designation of Hell's Canyon as a National Recreation Area has intensified interest in the prehistory of the extremely rugged, effectively inaccessible canyon bordering Idaho and Oregon. Through legislation, there is financial support available or forthcoming for conducting significant research in the prehistory of Hell's Canyon. Limited previous research in Hell's Canyon has emphasized cultural relationships with other areas, but the relatively isolated Consultants on Great Basin influences. This paper reviews aspects of Hell's Canyon NCA legislation relevant to research in prehistory, significant archaeological literature regarding Hells Canyon, and evidence for Great Basin and Plateau influences as the bases for working hypotheses for scheduled research. (11)

Frisbie, Theodore R. (SIU:Edwardsville) SOCIAL RANKING IN CHACO CANYON, NEW MEXICO: A MEXICAN-CHACONIAN HYBRID RECONSTRUCTION. Models for social ranking, i.e., chieftomdom organization, have been presented in print by several individuals who claim to account for what has been aptly termed "the Chacoan phenomenon"; however, the models do not take account of Mesoamerican derived features that are readily apparent in the area. The present paper utilizes both the cacicaua and clergy factors with the latter acting as catalyst on the former. The sequencing and patterning of cultural events offered by this interpretation appear to be consistent with the archaeological data currently available. (37)

Fry, Robert E. (Purdue) MODELS OF EXCHANGE FOR FUNCTIONAL CLASSES OF LOWLAND MAYA POTTERY. Several recent studies have shown that there are distinct distribution patterns for major functional classes of pottery during the Classic period. This paper will propose alternative models for pottery distribution at Lowland Maya sites, relating these to the overall economic structure of lowland sites. Evidence in support of one of the models from research at Tikal, Guatemala, and central Quintana Roo, Mexico will be presented. Implications of an approach to ceramic variability using both stylistic and technological attributes for traditional Type-Variety classification will be examined. (21)

Fryman, Jeanne W. (Museum of Northern Arizona) ANALYSIS OF THE INVENTORY DATA FOR THE BLACK-CERBAT ENVIRONMENTAL STATEMENT AREA, NORTHWESTERN ARIZONA. The Museum of Northern Arizona, as contractor, analyzed BL's Black-Cerbat survey data and prepared the classification and analysis portions of the ES. Computer-aided software was used to generate management information relevant to identifying areas of critical concern for cultural resources, evaluating probable impacts from the proposed action, and defining appropriate mitigation measures. This paper makes a critical appraisal of the survey's adequacy for estimating cultural resource populations for both general and specific management purposes, and examines the contributions of the survey and the data analysis to overall archaeological knowledge of the project area. (48)

Gallagher, Joseph G. (USDA Forest Service) SCARIFICATION AND CULTURAL RESOURCES: AN EXPERIMENT TO EVALUATE A TIMBER MANAGEMENT TECHNIQUE. National Forests employ a number of resource management techniques, few of which have been evaluated in terms of their cultural resource effects. Scarification is commonly carried out by timber managers to insure healthy timber growth on harvested units. The effect of this management practice on cultural resources is reported through the analysis of contextual changes within an artificial site that had been scarified. Management recommendations are offered. (12)

Garrow, Patrick H. (Soil Systems, Inc.) THE NEW AND THE OLD: THE BEDFORD-PINE AND EDENTON ARCHAEOLOGICAL INVESTIGATIONS. This paper discusses the approach to and results achieved from archaeological investigations of two urban tracts. Each tract occupied the same relative geographical position within its respective city, and each tract is considered largely as a result of its strategic location within a regional transportation/communication network. The methodology utilized to explore these tracts and the major results are discussed. Problems faced during these investigations are also discussed, and an approach is delineated that should be applicable to many types of urban archaeological investigations. (7)

Gasser, Robert E. (Arizona State) EXCHANGE IN HOHOKAM SUBSISTENCE PRACTICES. Did the Hohokam engage in exchange of subsistence items? A comprehensive survey of inter-site variability in archetropical food remains from Hohokam sites is examined with relative variability in the distribution of natural resources. Differences that cannot be explained using strictly ecological parameters might indicate trade in subsistence items. Exchange models developed from Pima and Papago ethnographies act as an aid in explaining the Hohokam archetropical botanical data. (1)

Gaxiola, M. (see Winter, M.) (49)

Geo, Joan M. (Massachusetts-Amherst) DATA RETRIEVAL FROM STORED MEMORIES. Collector interviews can maximize the identification and location of sites when used to structure fieldwork. It is frequently used as a heavily weighted device. In England, the distribution of collections and collector territories is a response to historic land tenure patterns and the attendant concepts of property and ownership. The composition of collections today similarly reflects local processes of trade and redistribution. From an understanding of these biases in collector-provided data, the proposed strategies are recognized as providing predictable and cost-efficient information. (13)

Giorgi, Patricia A. (BLM Phoenix District) A FIELD TEST OF ARCHAEOLOGICAL SENSITIVITY PROJECTIONS. IN THE BLACK-CERBAT ES AREA, NORTHWESTERN ARIZONA. Project-specific, intensive field examinations have been performed as part of the feasibility studies for the construction of many of the proposed range improvements in the Black-Cerbat Environmental Statement Area. Results of these surveys provide test verification for the analytical techniques utilized in writing the ES. Strengths and weaknesses of sensitivity projections based on statistically derived, environmentally stratified inventory samples are examined, with suggestions for the design of future management-oriented sampling strategies. (48)

Gold, Sharon I. (Georgia) EXCHANGE NETWORKS IN THE SOUTHEASTERN UNITED STATES. This paper discusses the exchange networks extant during the Middle Woodland (200 B.C.-A.D. 400) period of the southeastern United States. A hierarchy of Middle Woodland sites is developed for the southeast using the criteria of site size and artifact distribution. The movement of exotic raw materials throughout the southeast is discussed in relation to these proposed hierarchies. (46)

Gorenstein, Shirley (see Pollard, H. P.) (40)

Gorman, Frederick J. E. (Boston) REFUSE PATTERNING IN AN EIGHTH-CENTURY GLASS MANUFACTURING COMMUNITY: IMPLICATIONS FOR URBAN HISTORICAL ARCHAEOLOGY. Most colonial pyrotechnic industries were situated near fuel forests until the late 18th century when the transportation improvements permitted their relocation in certain areas. The establishment of urban glasshouses or metal foundries often initiated growth of heavy manufacturing districts, and archaeological surveys of such regions should locate the remains of these factories. Fragmentary refuse related to the metropolitan glasshouses and foundries rests more upon historical than upon archaeological information. Since this bias is reversed in the study of their earlier rural counterparts, analyses of refuse patterning at the rustic New England Glassworks (1780-1802) may aid in the archaeological identification of later urban factories. (7)

Gould, Robin A. (SIU-Carbondale) CERAMIC IMITATION: A SUPPLY-DEMAND INTERPRETATION. "Imitation" ceramics or local varieties as an indigenous response to trade wares have long been recognized in the archaeological record. The process underlying their incultation into the society in terms of response, assimilation of new ideas, and attempts to copy or imitate has not been addressed by traditional archaeological typologies. Documented examples of imitation will be summarized, and a formal economic solution will be offered to explain ceramic distribution in terms of a supply and demand model. (38)

Grady, Mark A. (SMU) CONSIDERATIONS OF THE TEXAS ARCHAIC INTERACTION SPHERE. Although the information that has been collected for the Archaic adaptation to Central and East Texas is not consistent, it suggests that, from a broad regional perspective, this life way changed considerably in terms of economic exchange networks and interaction spheres. More specifically, shifts in lithic raw material usage, artifact manufacture, and assemblage integration suggest that the Archaic adaptation was characterized by a substantial reduction in economic interaction and a concurrent trend toward localized specialization. Some of the implications of these observations are discussed, and suggestions are made for evaluating the accuracy of the resultant premises. (35)

Graham, Martha (North Carolina-Chapel Hill) SKELETAL RECOVERY IN FORENSIC CASES. Proper recovery of skeletal material in forensic cases is crucial. Intervention by lay persons may lead to destruction of the scene, less than full recovery of pertinent materials associated with the remains, and, in some cases, damage to the skeleton itself. Cases are presented to illustrate the above, and discussion follows as to education and working with law enforcement agents in skeletal recovery procedures. (31)

Granger, Roger T. (South Florida) EXCAVATIONS AT YBOR CITY, TAMPA, FLORIDA. Archaeological salvage and research in an ethnic community in Tampa are discussed. The site was
occupied from 1886 until 1978. Problems of ethnic identification, dating by bottle chronology, and culture change will be discussed. (7)

Grayson, Donald K. (Washington) THE GATECLIFF SHELTER MICROVERTEBRATES. Gatecliff Shelter (26NY301) is located in the Toquima Mountains of central Nevada. The rich and deep deposits have been dated to at least 50,000 years ago. The size of the area occupied by the microfauna, the bulk of which is composed of artiodactyls, especially elk (Odocoileus hemionus), is significant. Small mammals—primarily rodents, voles, and shrews—which are also present, form the basis of this report. Interferences concerning the dispersal of the area surrounding Gatecliff are discussed, as are the implications of this microfauna for understanding the modern and past biogeography of Great Basin mammals. (5)

Grayson, Donald K. (see Mehringer, Peter J., Jr.) (5)

Grebing, Paul (Eisenhower) DESERT VERSUS RIVER HOHOKAM: A MATERIALIST CRITIQUE AND RESEARCH DESIGN. The cultural materialist paradigm sets clearly defined epistemological limits for archaeology research. In these terms, existing models of the Desert-River Hohokam interface are inadequate. Either they (1) are based on non-materialist assumptions and propositions, or (2) are not systematically ordered in terms of the materialist paradigm. Furthermore, a critical review of published and unpublished data from the Santa Cruz drainage shows that these sources do not lend themselves to the systematic distributional studies from which a materialist model might be constructed. In order to resolve this dilemma, a multistage research design to discover key patterns in material culture distributions is outlined. (8)

Green, Margerie (Arizona State) VARIATION IN CHIPPED STONE RAW MATERIAL USE ON BLACK MESA. Results of a survey to locate sources of raw materials used in making chipped stone artifacts for the Black Mesa area of northeastern Arizona are presented. The distribution of the various raw material types for several hundred sites within a 25 square mile survey area is discussed. Variation in the degree of reliance on different sources as indicated by proportions of raw material on sites is viewed over time. Particular emphasis is placed on distance from source and possible differences between habitation sites and limited activity sites. Computer graphics are used to illustrate observed patterns. (22)

Green, Stanton W. (South Carolina) THE STABILITY OF FRONTIER AGRICULTURAL SYSTEMS: SOME ARCHAEOLOGICAL IMPLICATIONS FOR THE SPREAD OF AGRICULTURE IN TEMPERATE HABITATS. Frontier agriculture is a process whereby agriculture is introduced into a habitat. The discussion will focus on both the new set of cultural-ecological interactions set off by the colonization process and the implications for long-term stability of temperate agricultural systems. The model delineates certain key variables and suggests that, in temperate habitats, agricultural colonization tends to select for growing populations, which permutate the colonization process. The archaeological implications of this model for the spread of agriculture into temperate habitats are discussed and evaluated against two cases: prehistoric (Neolithic) Denmark, and historic (19th century) Finland. (13)

Green, Stanton W. (see Brooks, M.) (13)

Greenwood, Roberta (Los Angeles County Museum) LAND DEVELOPERS INVOLVEMENT IN PUBLIC ARCHAEOLOGY. Environmental laws in California require developers and land managers to be concerned with archaeological resources. However, many times this concern is with the letter and not with the spirit of the law. This attitude has resulted in the need to educate land developers in the evaluation of their projects in order to fully understand the impacts and how they can be mutually beneficial to them and to archaeologists. Using the HUD-sponsored San Buenaventura project in Southern California, suggestions are offered about how to educate and involve developers in responsible resource management. (18)

Griffin, P. Bion (Archaeological Research Center Hawaii) TECHNOLOGY AND THE HAWAIIAN ADAPTIVE SYSTEM. A science of technology, placed in a theoretical context of adaptation of populations of Homo, may allow insights into expansion of human species. Data drawn from Polynesian societies illustrate the application of methodology to understand the trajectories of adaptation. Constraints on the development of technology in Hawaii and Tahiti are discussed, and patterns of the interaction of the technological and social systems analyzed. (14)

Gummerman, George J. (Southern Illinois) THE HOHOKAM OF THE NORTHERN PERIPHERY. New data from the region north of Phoenix reinforces the suggestion that the Hohokam maintained an elaborate system of local specialization and trade in subsistence and non-subistence items. It appears that this internal Hohokam system of local specialization was reinforced by external economic relationships with the regions north and west of central Arizona. The result of the local economic specialization and of the local distribution of specific economic relationships with non-Hohokam peoples has resulted in a large number of Hohokam "regional variations" in a relatively small area in central Arizona. (8)

Hass, Herbert (see Hassan, Alija A.) (6)

Hales, Donald (see Hudson, L. B.) (27)

Hanty, David J. (Georgia) ACTIVITY ANALYSIS OF THREE STRUCTURES FROM A PROTOHISPORIC SITE IN NORTHWEST GEORGIA. Cultural material recovered by flotation from three structures at the protohistoric Little Eagle site in northwest Georgia has been analyzed for distributional and association patterns. Several activities including food preparation, chert knapping, storage, and sleeping can be recognized and localized within each structure and indicate a general domestic function for all three structures. (46)

Hamblin, Nancy L. (Arizona) ISA COZUMEL ARCHAEOLOGICAL AVIFAUNA. This paper represents the summary and analysis of several hundred bird bones comprising approximately 25 different species, excavated from six prehistoric Maya sites on the island of Cozumel, Mexico, in 1972-73 by the associated Archaeological Project. Discussion will focus on the differential utilization of various ecological zones, a comparison of avifaunal exploitation by the different sites, the use of avian species for ceremonial/religious purposes, the role of specific birds in the Cozumel trade network, and the relative significance of the various birds in the diet of the Cozumel Maya. (5)

Hamblin, Robert L. (Arizona) ELITE DEVELOPMENT AND PEASANT REBELLION: MODELING CLASSIC MAYA DATA. This paper employs mathematical models of social conflict, collective learning, and social development to study the socio-cultural growth and decline of the Classic Maya. The data are the through-time occupancy of Maya ceremonial centers by peoples producing elite monuments with long-count dates. A comprehensive theory is presented which posits that the patterns of change resulted from the cumulative, through-time dialectic effects of developing social technology and escalating conflict following a brief period of peasant rebellion. The archaeological evidence for various alternative theories is then evaluated. This analysis shows that the dialectic models account for both the eras of growth and decline. (27)

Hammatt, Hallett H. (Archaeological Research Center Hawaii) GEOARCHAEOLOGICAL STRATIGRAPHY IN THE HAWAIIAN ISLANDS: SOME PROPOSITIONS AND PRELIMINARY RESULTS. The relatively short time span of human occupation (approximately 1,300 years), extreme micrometeorological contrasts, and rapid pedogenic alteration of deposits would appear to make the application of inter-site stratigraphic research related to archaeological problems in the Hawaiian Islands impossible. However, investigations on the islands of Kaho'olawe and Kauai show that there are recognizable local and regional stratigraphic sequences. On Kaho'olawe two major depositional units can be recognized by one soil stratigraphic unit and a widespread ch逃离y layer. There is evidence that island-wide burning may have been the initial cause of cumulative deforestation which dramatically altered habitats and led to depopulation of the island. (14)

Hampson, Steven E. (Irvine) CLOSED MODELS OF OPEN SYSTEMS. Cultural systems are open systems; they lack clear divisions from one another, from noncultural systems, and from their own later phases. An indefinite number of variables interact in open systems; however, all explicit systems models are closed since they must specify a definite number of variables. Two consequences of this observation will be: (1) closed models of open systems are most adequate when focused on system boundaries; (2) the possible descriptions and strategies for explanation of cultural stability differ from those for cultural change. (2)

Hanson, Christine (Arizona State) POPULATION STRUCTURE AND COMPOSITION ON BLACK MESA, ARIZONA. Change in the archaeological record is often attributed to population changes. Analysis of human skeletal material recovered by the Black Mesa Archaeological Project offers an opportunity to explore population structure and composition. Bivariate analysis is presented and a population model proposed. The implications of this model are discussed. Osteological evidence of paleodemography and paleopathology is investigated in relation to changing social patterns and nutritional habits. The possibility of biological affinities with other prehistoric groups is also examined. (22)

Hanson, Glen (South Carolina) THE RUSSELL ARCHAEOLOGICAL PROJECT: A SURVEY OF FORESTED LANDS IN THE SOUTH APPALACHIAN PIEDMONT. The Russell Archaeological Project involved the survey of heavily vegetated area. The application of strictly probabilistic sampling designs became a central concern because of the inability to identify sites in locations known to contain them. This paper discusses the results of the project and offers
Hartman, Jeff (Arizona State University) PREDICTING OCCUPATION DATES OF PREHISTORIC BLACK MESA SITES: A COMPARISON OF METHODS. Using ceramic design attribute frequencies and ceramic type frequencies from a set of tree-ring dated sites on other sites in the region, several methods of potentially ordering sites are compared in terms of their predictive accuracy. In addition, discussions are presented of dates of design change through time in northeastern Arizona and of the value of traditional polythetic ceramic types in estimating site dates. (22)

Hardery, Donald L. (Nevada-Reno) HISTORICAL ARCHAEOLOGY IN THE GREAT BASIN: RETROSPECT AND PROSPECT. The development of historic period archaeology in the Great Basin is examined from the perspective of theory and method. Several issues are discussed, including the impact of recent federal legislation, the "anthropological transformation" and its effect upon research strategies, the study of ethnic relationships, frontier adaptations, and training programs. The use of historic sites archaeology in "applied" programs, such as the UNESCO MAB (Man and the Biosphere), is discussed as a possible future direction. (5)

Harrill, Bruce (see Breternitz, C. D.) (30)

Harrold, Francis B., Jr. (Chicago) A COMPARATIVE STUDY OF EURASIAN PALEOLITHIC BURIALS. Although they are a rich source of information on the sociocultural aspects of Paleolithic adaptive systems, burials have seldom been the object of systematic study. Untestable attempts to interpret the mortuary symbolism of extinct cultures have less potential value than documentation of the types and degree of variability in Paleolithic burials, which reflect indirectly the sorts of social distinctions recognized by the societies of the deceased. Quantitative analysis of data presented in the literature indicates, among other findings, that there are significant differences in mortuary variables (and, by implication, in certain sociocultural variables) between Middle Paleolithic and Upper Paleolithic burials. (34)

Hartman, Dana (Museum of Northern Arizona) ARCHAIC ADAPTATIONS IN EAST CENTRAL ARIZONA. During the 14 month period of September, 1976, to November, 1977, the Museum of Northern Arizona mitigated 48 impacted sites along the Coronado Transmission Line in east central Arizona. Several of these sites are Archaic food processing camps with artifactual assemblages characteristic of the Desert Culture. The transmission line traverses a number of distinctive micro-environmental zones and, without exception, all of the mitigated Archaic camps are associated with a specific environmental situation. The location of the Archaic camps in areas of optimal environmental conditions often resulted in their reoccupation during Basketmaker/Pueblo times. (42)

Hassan, Afifa A. (Washington State) EVALUATION OF BONE FOR RADIOCARBON DATING. Radiocarbon dates of bone collagen and apatite from several archaeological sites are compared with other dates. The pure collagen yielded ages in the expected ranges. Amino acid analysis served as a means to check the purity of the separated collagen and the reliability of the techniques employed. Carbon isotope studies on modern and fossil bones and the associated sedimentary carbonate indicate post-mortem exchange of carbon in bone apatite. X-ray diffraction and infrared studies indicate post-mortem recrystallization of the bone. Several dates, in some cases, could be improved using the fractional hydrolysis technique. Our results so far indicate that collagen and apatite bone dating can be significantly improved by adequate sample pretreatment. (8)

Haasf, Christine A. (UCLA) CHANGING RESOURCE USE IN SUSTAINABILITY AGRICULTURAL GROWTH PREDICTIONS FROM AN ECONOMIC MODEL. A model based on cost-benefit analysis is used to produce projections about resource mixes in subsistence agricultural systems. Environmental information for three distinct time periods at one location in the Mimbres River Valley, New Mexico, is organized within the framework of a site-catchment analysis. The results of the site-catchment analysis are graphically depicted in the model as a series of potential yields for various resource strategies in each time period. The predictions concerning resource use are derived when prehistoric population size is considered with reference to the potential yields. These predictions are then tested against the archaeological data. (36)

Hay, Conran A. (Pennsylvania State) THE STRUCTURE OF OBSIDIAN PRODUCTION AT EARLY CLASSIC KAMINALJUYU, GUATEMALA. A technological analysis of the obsidian assemblage from Early Classic Kaminaljuyu, Guatemala indicates that obsidian production was internally differentiated and specialized. The components of this industry are identified, and its structure is reconstructed. At Kaminaljuyu, obsidian production, distribution, and consumption were intimately related to more general economic relationships, such as chiefly redistribution and market exchange. An analysis of this industry thus provides information concerning the economic structure of Kaminaljuyu. Furthermore, it suggests that the obsidian industry had important influences on the development of Kaminaljuyu society. (27)

Haynes, C. Vance (Arizona) GEOCHRONOLOGY OF THE LOWER POMME DE TERRE RIVER. The study includes the important archaeological and palynological sites of Rodgers Shelter, and Phillips, Koch, Boney Springs, Trolleyer and Jones Springs, all of which occur in alluvium of three terraces (T-4, T-1, and T-2). Koch and Boney Springs alluvium, dating from 13,000 to more than 50,000 B.P., contains Rancholesaean faunas and no evidence of early man. Archaeological evidence is confined to the Holocene deposits at Rogers alluvium (T-1b), ca. 11,000 to 1,400 B.P., and Pippins alluvium (T-0, ca. 1,000 B.P. to the present. A major erosional episode occurs at ca. 8,000 B.P.; an erosional hiatus of 1,000 years occurs between 6,300 and 5,200 B.P.; and another of ca. 500 years occurs at ca. 1,100 B.P. Other breaks in the radiocarbon chronology are not definitely related to erosional contacts. (28)

Haynes, C. Vance, Jr. (see Hassan, Afifa A.) (6)

Hays, T. R. (see Morenon, E. P.) (45)

Healy, Paul F. (Trent) THE PALEEOECOLOGY OF THE SELIN FARM SITE (H-CN-5), DEPARTMENT OF COLÓN, HONDURAS. Zooarchaeological analysis of a sizeable, well-preserved collection of faunal remains excavated from site H-CN-5 in 1976 provides the first detailed information on the paleoecology of a Selin Period settlement in northeast Honduras. The Selin site, located just north of Trujillo, and south of the Guaimoros Lagoon, in the Department of Colón, reveals a prehistoric subsistence pattern that heavily exploited the rich local marine resources, the lagoon estuary zone, and the forest fauna of the Aguán River Valley and Honduran interior. The report outlines the diversity of faunal and molluscan species recovered and the respective changes in their representation through the seven century span of the Selin Period (ca. 300-1,000 A.D.). (22)

Heisler, David M. (Southern Mississippi) ROMAN INFLUENCE OF THE PEOPLES OF SCOTLAND. Lowland Scotland was at times part of the Roman Empire; Highland Scotland was not. Archaeological evidence indicates that life in the North was unaffected, except for the possible migrations of peoples from southern England, forced north by Roman pressure. In the Lowlands, romanization of native centers can be seen, but rural life remained largely unchanged. This situation can be credited to the transient military nature of the Roman experience in Scotland. (23)

Hernandez, G. (see Winter, M.) (49)

Hesse, Brian (see Wapnich, P.) (23)

Hester, James J. (see Huse, H.) (45)

Hester, James J. (see Walker, D.) (12)

Hester, Thomas R. (Texas-San Antonio) QUARRY SITES AND THE LITHIC PRODUCTION SYSTEMS IN THE SOUTH AND SOUTH CENTRAL TEXAS. Chert quarries and quarry workshops in south central and southern Texas have been largely ignored by archaeologists. However, these quarries represent an important segment of the aboriginal settlement systems, and the analysis of these sites has added greatly to our understanding of the prehistoric lifeways in these areas. In the past several years, the author and colleagues at the UTSA Center for Archaeological Research have conducted systematic studies of several quarry workshops. The role of these workshops in the settlement and lithic production systems is examined in this paper. Two distinctly different quarry workshop systems are noted for the two regions, reflecting divergent lithic resources and differing modes of resource exploitation. (33)

Hobgood, John (Chicago State) AZTEC AZTLÁN AND THE GREATER SOUTHWEST. The first recorded interest in rediscovery of Aztlán, traditional northern homeland of the Aztecs, is given by Diego Durán in his account of the expedition sent by Moctezuma I (ruled 1440-1486) in search of Chicomostoc. Another early post-Conquest account is given by Indians living near Casa Grande, identifying this great site as the "Casa de Mocetzuma." In later times the myth of Aztlán spread as far as the Moskokee Indians. And other experiments demonstrate the powerful and continuing influence of the Mesoamerican Great Tradition well into the Colonial period in the Greater Southwest. (37)
Holoway, Richard G. (Texas A & M) ORGANIC RESIDUE ANALYSIS OF PREHISTORIC LITHIC ARTIFACTS: AN EXAMPLE FROM HINDS CAVE, TEXAS. Many lithic artifacts recovered from Hinds Cave, Texas, contain the presence of organic residue presumably associated with use. A small sample of this residue was removed from each artifact and a large quantity of organic debris was revealed, much of which was identifiable, some to the species level. Chemical tests were conducted which indicated the presence of such plant remains as lignin and starch. The use of this data, in conjunction with detailed edge wear analysis, yielded information concerning both the duration of tool use and identification of the actual plants that were being processed with these tools. (28)

Homon, Robert J. (Hawaii State Historic Preservation Office) INLAND EXPANSION AND THE FORMATION OF HAWAIIAN INCipient STATES: A.D. 1400-1650. Data collected during the ongoing archaeological survey of Kaho'olawe Island, including basaltic glass hydrazide-tinged age determinations for most sites and features, allow testing of important aspects of a model of incipient state formation in pre-contact Hawaii. The archaeological data of Kaho'olawe, supported by fragmentary evidence from other Hawaiian islands, indicate a major inland expansion of settlement and land use beginning ca. A.D. 1400. It is suggested that this group-wide inland expansion had profound demographic, environmental and socioeconomic consequences that may be directly related to the formation of incipient states by the mid-17th century. (14)

Hopkins, Nicholas A. (Autonomia Metropolitana-Iztapala) OTOMANGUEAN LINGUISTIC HISTORY. The development of Otomanguean, a major linguistic family of Mexico and Guatemala, is traced from the beginnings of its diversification in the Archaic. Recent linguistic research includes the first systematic reconstruction of Proto-Otomanguean phonology and lexicon, and the first treatment of the languages in terms of innovations shared across the developing subgroups. Ethnobotanical vocabulary of Proto-Otomanguean has been correlated with plant remains from Tehuacan, a proposed homeland of Otomanguean. Phonological developments reflect the formation of regional subgroups which correlate with archaeological material. Loan words indicate contacts with Mixe-Zoque (Olmec). A homeland for Chihuanac-Manguean is proposed. (49)

Howard, James D. (see DePratter, G. B.) (46)

Hoyt, Margaret A. (New Mexico State) CHIMU STATUS DIFFERENTIATION AS REFLECTED IN THE CERAMICS. Archaeological excavation has indicated that the Kingdom of Chimor on the North Coast of Peru possessed a stratified society; this is further borne out by the evidence from the ceramics manufactured by these people. At least two distinct classes or castes are represented on the pottery; these are distinguished not only by the activity they are engaged in, but also by their dress and ornament and, in some cases, by their placement on vessels representing Chimor buildings. Supporting data from the Spanish chronicles are also presented. (9)

Hudson, Luanne B. (USC) ST. GEORGE AMIDST THE CLASSIC MAYA: SERPENT SLAVING AS REPRESENTED ON CERAMIC VESSELS. An almost identical scene found on various Classic Maya ceramic vessels is described and interpreted. Two serpent forms, one of an undulating serpent whose body is pierced by a spear, the other of a serpent's head. Other vessels and sculptural forms with serpents depicted were also studied in order to determine if they could be separated into different categories. Based on the analysis, it is suggested that: (1) this was a unique scene, (2) it was mythological, (3) the paraphernalia of representation is two distinct types, and (4) the scene was connected with some form of ancestral rites. (27)

Hunter-Anderson, Rosalind (New Mexico) THE RISE OF MATRIFOCALITY IN THE WESTERN PUEBLO REGION. During the first part of the rise of matrilocality (matrilocality and matrilocality) in the WPR is proposed. Initial selective contexts for matrilocality occurred toward the end of the Basketmaker Period (ca. 500-800 A.D.), derived from a shift from primary winter dependence on live game and stored wild plants to more emphasis on horticultural food for winter consumption. Archaeological correlates of attendant social organizational changes will be discussed. (38)

Huse, Hannah (Archaeological Associates, Inc.) THE BISTI-STAR LAKE CULTURAL RESOURCES. During the summer of 1977, Archaeological Associates, Inc., a private contracting firm headquartered in Boulder, Colorado, conducted a Class II sample inventory of cultural resources (both prehistoric and historic) to be found on Bureau of Land Management holdings in northwestern New Mexico. The contract called for the survey of 59 Class II sites (37,510 acres) leading to the location of 421 Class II sites with 252 components of occupation. In addition, 267 isolated artifacts were recorded. Principally Archaic and historic Navajo sites were found with lesser numbers of Pueblo and Paleo-Indian artifacts. The collected information is to be used in designing an Environmental Statement and mitigation program in advance of coal stripping to begin in 1980. (45)

Isebell, William H. (SUNY-Binghamton) HUARI URBAN CONFIGURATIONS. The development of urban configurations characterizes the transformation from the Early Intermediate Period to the Middle Horizon in the Valley of Ayacucho. Based on the preliminary results of the Huari Urban Research Project, these Ayacucho urban patterns are described and future research strategies are considered. (4)

Ives, David J. (Missouri-Columbia) THE USE OF TRACE ELEMENTS IN FINGERPRINTING THE CRESCENT HILLS PREHISTORIC QUARRYING AREA. While an important raw material for the prehistoric inhabitants of North America, chert presents a number of problems for the analyst. Equally so, the archaeologist faces a number of problems in assigning chert from archaeological contexts to geological contexts. The analysis of chert from an eastern Missouri prehistoric quarry is used as an example of the steps that can be taken to ameliorate both analytical and interpretative problems. (43)

Ives, David J. (see Evans, D. R.) (13)

Jacobs, Linda K. (Oregon) THE ARCHAEOLOGICAL IMPLICATIONS OF A VILLAGE IN TRANSITION: THE CASE OF TELL-I-N UNAR, IRAQ. A census of a small agricultural village in southwestern Iran provides substantive data for estimating population in archaeological contexts. The implications for such estimates are explored and alternative methods for estimating population are suggested, based on ethnographic documentary data. The social structural changes within the village, as they are reflected in architectural changes, are outlined: the problems of understanding such changes archaeologically can perhaps be solved by some of the alternative methods for estimating population mentioned above. (44)

James, Gregory B. (Wisconsin-Milwaukee) ANALYSIS OF FIGURINES FROM THE PUEBLA PRECLASSIC. Excavations and site survey conducted in the Puebla Valley between Cholula and the Valley of Tehuacan have yielded several hundred ceramic figurines. The extreme sensitivity of clay figurines to variation in style suggest the utility of multivariate statistical analysis in identifying variation that is temporally sensitive. Further analysis based on these statistical manipulations is then possible. (40)

James, Steve R. (Utah) AN ARCHAEOLOGICAL RECONNAISSANCE IN THE UPPER REACHES OF THE BLACK ROCK DESERT, NORTHWESTERN NEVADA. In the summer of 1976, the Bureau of Land Management conducted a cultural resources survey at the foot of the Pine Forest Range in the upper Black Rock Desert, an aim of Pleistocene Lake Lahontan. Although the previous surface archaeology in the Black Rock Desert has yielded a number of early projectile point representative of lacustrine adaptations of the Western Pluvial Lakes Tradition (9,000-6,000 B.C.), the evidence from this survey indicates instead reliance upon springs after the desiccation of the region. As a short radius of a few springs, seven large lithic scatters and thirty smaller ones were identified and recorded. Samples of the lithic artifacts and materials were analyzed in terms of chronology, environment, and subsistence of the area. (5)

Jenne, Dawn E. (Arizona State Museum) PREPARING LARGE SAMPLES FOR COMPUTER ANALYSIS. As part of the Arizona Public Service Cholla-Saguaro Mitigation Project, information from a sample of over 800 previously recorded sites was collected, coded, and keypenched for computer analysis. Problems encountered in standardizing the database and investigating its interpretative potential are discussed. Variable selection and coding form design are presented from the perspective of ensuring accurate and efficient conversion of raw data into computer-manipulable representations, and time requirements of various stages of data collection and preparation are given. (15)

Jansen, Maarten (see Josserand, J. K.) (49)

Jeffreys, William F. (Georgia) LITHIC ARTIFACT DIVERSITY AS A MEANS OF DISCERNING INTER-SITE ACTIVITY VARIABILITY. The paper is a report on the results of analysis of lithic artifact variability among Woodland Period sites in the Lookout Valley area of northwest Georgia. Various categories of flaked stone tools and debitage are utilized as attributes in an attempt to discern patterns of inter-site activity diversity in the research area. Site activity diversity is discussed with respect to site location, distance to lithic resource acquisition areas, and other environmental variables. (19)

Jewett, Roberta A. (Arizona State) SOCIAL AND SETTLEMENT ORGANIZATION IN TONTO BASIN, CENTRAL ARIZONA. Regional studies and surveys have received increasing attention in the
archaeological discipline with a concomitant concern regarding the degree to which survey data is adequate for making behavioral inferences. Data resulting from a survey recently conducted in Tonto Basin, central Arizona, is examined with respect to particular population and spatial variables. The variables discussed are density, agglomeration, hierarchy, differentiation, and evenness. Morn's measure of contiguity and the nearest neighbor statistic are used for measuring the distribution of sites located in transect sampling units. Patterns resulting from the analysis and their behavioral implications are discussed. (38)

Jimenez-Moreno, Wigberto (INAH) SAHAGUN IN THE INTELLECTUAL CONTEXT OF HIS TIME. This paper presents new information about Sahagun's biography, placing him in the intellectual context of his time, in order to understand how he developed his extraordinary capacity as an ethnologist, historian, and linguist. This work represents a new attempt to fully appreciate the context of his work. (18)

Johnson, Donald Lee (Illinois-Urbana) SOIL-GEOMORPHIC AND SOIL-ARCHAEOLOGICAL RELATIONSHIPS, OSAGE RIVER BASIN, WESTERN OZARK HIGHLAND. On Holocene-aged river terraces in the Westphal Osage River Basin, Missouri, a relationship between soil type and degree of soil profile development versus geologic age of the parent material and topographic position. This relationship is seminal to soil-archaeological relationships. Archaic and Paleo-Indian cultural materials, for example, are not found in situ in Uplifted profiles, nor are Woodland materials be expected within Eutrochoret profiles, except for clays. Among soils in the area, the bottom lands (Enticels, Inceptisols, Alfisols) had maximal nutrient potential for woodland horticulture, though other non-nutrient factors may have operated. (26)

Johnstone, Joel G. (see Wood, J. S.) (24)

Jones, Kevin T. (Colorado State) PALEOENVIRONMENT AND PREHISTORIC SETTLEMENT PATTERN IN THE SAN LUIS VALLEY, SOUTH CENTRAL COLORADO. The discussion will center on the results of archaeological test excavations of three prehistoric sites in the Dry Lakes area of the San Luis Valley. A cultural component was encountered in which profuse amounts of fish bones were identified. Identification of the bones revealed that a genus of fish (Ictalurus) was represented which was not previously known to be native to Colorado. The present day environmental conditions of the area are such that this fish could not meet the conditions necessary to support a Ictalurus population. A close correlation is demonstrated between the paleoenvironment and prehistoric settlement patterns. (47)

Josserand, J. K. (INAH) MIXTEC DIALECTOLOGY: INFERENCES FROM LINGUISTICS AND ETHNOHISTORY. Recent linguistic studies establish dialect areas and ordinate phonological developments within Mixtec: ethnohistory and linguistics collaborate to provide evidence for dating phonological changes in the development of Mixtec dialects, and for testing hypotheses relating to the socio-political dominance of certain centers (Tepozcalli, Achiutla, Yanhuitlan, Tututla). The extent of dialect areas in early contact times may be documented through archival research. Varieties of Mixtec encountered in early documents (especially 18th century) are related to present-day Mixtec dialects. The proposition that the Tepozcalli dialect was imposed by scribes as a 'standard' variety in the central Mixteca Alta is investigated. (48)

Justeson, John S. (see Hampson, Steven E.) (2)

Karwesky, Robert A. (Florida State) ARCHAEOLOGY OF MOUNDS A AND B AND PLATEAU, OCMULGLEE NATIONAL MONUMENT. Intensive excavations by the WPA in the southeast are responsible for formulating the basis of much of our knowledge of southeastern archaeology. Work under the direction of Dr. A. R. Kelly in what became Ocmulgee National Monument was particularly important to central Georgia. The material excavated from Mounds A and B at Ocmulgee in 1934-1938 and 1967 has been analyzed for the National Park Service by Florida State University. Results of this analysis have allowed the reconstruction of the mound A ramp. A reconsideration of the integration of this area into the archaeology of the Macon Plateau and central Georgia. (49)

Kaschko, Michael W. (Hawaii) HAWAIIAN SOCIAL UNIT BOUNDARIES AS ARTIFACTS. This paper demonstrates a means of archaeologically defining primary and secondary localized groups in Hawaii through the reconstruction of prehistoric boundary systems. Three bodies of information were utilized: the ethnohistoric sources describing Hawaiian land division in general, the original Hawaiian land grant descriptions and survey records for the specific areas, and the distribution patterns of actual archaeological features (especially prehistoric trails). The recognition of such land-social unit boundaries as artifacts holds great potential for the archaeologist in approaching, synchronically and diachronically, problems of prehistoric Hawaiian social, economic, and political organization. (14)

Kay, Marvin (Illinois State Museum) NEW INTERPRETATIONS OF RODGERS SHELTER AND PHILLIPS SPRING. Renewed excavation and analysis of Rodgers Shelter and Phillips Spring, initiated in 1975 as part of the migration program for Truman Reservoir, Missouri, have added substantively to our information on subsistence, community layout, stylistic and techno-functional indicators of prehistoric and ceramic complexes of the western Ozark Highland; and has defined the earliest evidence of tropical plant husbandry (4,000 B.P.) in eastern North America. This paper surveys the major highlights of this research which deals with a nearly complete Holocene archaeological sequence. (26)

Kelley, Ellen Abbott (Sul Ross) SIPAPU AND PYRAMID TOO: THE TEMPLE OF THE CRYPT AT ALTA VISTA, CHALCHIUTIES. The Temple of the Crypt at Alta Vista, originally a free-standing tomb of a high status individual, later was incorporated into the basin platform of a two-story temple. The temple itself was an elevated room, while the basement contained the crypt. The analogy to an above-ground rectangular kiva with a sipapu in the floor used as god-entry is obvious. Superimposed constructions converted the structure into a stepped Mesoamerican pyramid. This development suggests that some southwestern kiva-sipapu complexes are analogous to Mesoamerican pyramid-tomb complexes and that both complexes have a common Mesoamerican origin. (37)

Kelley, J. Charles (see Kelley, E. A.) (37)

Kelly, Robert (see Thomas, D. H.) (5)

Kikuchi, William K. (Kauai Community College) THE EVOLUTION OF HAWAIIAN AQUACULTURE. Hawaiian agriculture was a prehistoric native innovation, its roots were to be found in the development of irrigated agricultural ponds. Architectonic agricultural sites, whether found as inland ponds or along coastal areas, were simply considered to be extensions of agricultural technology. The evolution of the pondfields and fishponds had a significant ecological and cultural impact on the native society. Ecologically, pondfields and fishponds became artificial estuaries enriching the natural riverine and marine environments. Culturally, their evolution paralleled the development of the elite class and, increasingly, became one of the symbols and manifestations of religious, political, and economic power. (14)

Kimy-Aaes, Kathryn M. (see Lees, W. B.) (46)

Kincaid, Chris (BLM Phoenix District) IMPACT ASSESSMENT THROUGH STRATIFIED RANDOM SAMPLE INVENTORY FOR THE BLACK-CERBAT ES, NORTHERN ARIZONA. This paper discusses ways that inventory information derived from general, environmentally stratified statistical samples can be brought to bear on specific land management decisions. Archaeological site data for the Black-Cerbat ES were gathered using stratified, random sample inventory methods, without direct regard to centers or project areas or grazing allotments per se. This required that new analytical techniques be developed to give reliable impact assessments for a wide variety of small, surface-modifying projects scattered over nearly 2 million acres. The paper highlights the difficulties of using traditional types of cultural resource management information in preparing highly specific, project-related ES inputs. (48)

King, Frances B. (Illinois State Museum) CULTURAL, CLIMATIC AND EPIPHYSICAL FACTORS INFLUENCING VEGETATION. Examination of the "presettlement" vegetation, as recorded by government surveyors in the early 1800's, finds many presently forested areas where vegetation was primarily prairie or lowland savannah, or perhaps scrub or brush. This documentation is modifying the environment. Whether or not fire was intentionally used to manipulate the vegetation, the result was, at least in late Holocene time, a forest and prairie mosaic with large areas of ecotones and more abundant and diverse plant resources than occur in similar but undisturbed areas today. Based on more western analogs, the earlier "hypothermal" dry interval was probably more open on the uplands with proportionately greater percentages of plant resources concentrated in the river valleys and floodplains. (25)

King, James E. (Illinois State Museum) BIOGEOGRAPHY OF THE WESTERN OZARK HIGHLAND: THE POLLEN EVIDENCE. By 12,000 years B.P., sparse and related "northern" species disappeared from the western Ozarks, and were replaced by a mesic oak-dominated deciduous forest that persisted until 5,500 B.P., when there was a climatic shift to the drier hypothermal climate. Decline, replacement of mesic species by xeric species, and the southward migration of the prairie-rift valley border characterizes the hypothermal. About 5,500 B.P., increases in forest density and declining herbs suggest the return of a more equitable climate. However, the continued absence of some mesic species indicates that the post-hypothermal climate remained somewhat dry, even to the present. (26)
King, Mary Elizabeth (Pennsylvania University Museum) THE SANDALS FROM HINDS CAVE, VAL VERDE COUNTY, TEXAS. In the 1974 through 1976 field seasons, Hinds Cave produced 91 sandals, or sandal fragments, of at least six distinct types. The chronological sequence of sandal types, their relationship to types in neighboring areas, and unique features will be discussed. (28)

Kinkade, Gay M. (BLM Safford District) STRUCTURED RECONNAISSANCE SURVEY FOR THE SAN SIMON-GILA ENVIRONMENTAL STATEMENT, SOUTHEASTERN ARIZONA. This paper reports on the preparation of the cultural resources portions of the Bureau of Land Management's San Simon-Gila Environmental Statement, recently published in draft form. Because of time and manpower constraints, survey was limited to a modified reconnaissance strategy, treating grazing allotments as individual survey areas. The cultural resource data collection and impact analysis and review, and their applicability to other environmental assessments and plans and related environmental documents are discussed. The use of reconnaissance surveys is examined and the conclusion drawn that they can yield substantial and valid data for making sound predictions on site distribution and density. (48)

Kirch, Patrick V. (Bishop Museum) ECOLOGICAL PERSPECTIVES ON PREHISTORIC HAWAIIAN MARINE EXPLOITATION. While archaeologists in the Hawaiian field have provided a solid framework in the typological analysis of the material culture of fishing, a broader and integrating theoretical perspective is required. Stress needs to be laid on the definition and variability and contrast in environment, and of cultural response to this ecological matrix. Functional analyses of fishing gear, faunal analyses, and environmental studies of contemporary marine ecosystems and resource distribution in the methodologies that can be integrated by an ecological perspective. Recent and continuing investigations in Hawaii provide a database upon which the appropriateness and utility of such a paradigm may be tested. (14)

Klager, Karol J. (see Baker, L. L.) (6)

Klein, Terry (SIU-Carbondale) EXAMINATION OF CHANGE IN SOCIAL GROUP SIZE ON BLACK MESA. Anthropologists have assumed both implicitly and explicitly that there is a consistent relationship between social size and social group size. They have pointed out the need for more attention to the size of existing archaeological data. A method is constructed whereby bounded space is used to measure change in social group size on Black Mesa. A range of variables that presumably affect the size of bounded space are examined in detail. (22)

Klesert, Tony (SIU-Carbondale) REGIONAL VARIATION ON BLACK MESA: A COMPARISON OF DISCRETE AREAS. Preliminary investigations of the extreme northern canyon areas of Black Mesa suggest this area has a culture history and organizational strategies dissimilar to that of areas to the south, being more directly influentially by the Black Mesa Pueblo. At present, initial discoveries in this extreme northern area of Black Mesa are summarized and compared to the extensive data base available from the southern areas. In light of this additional data base it is suggested that certain previously accepted conclusions concerning "northern Black Mesa" should be altered. (22)

Klymushyn, Alexandra M. Ulana (California-Santa Barbara) SOCIAL ORGANIZATION IN AN IMPE- RIAL CAPITAL. Chan Chan is known to have been the capital of the Chimú empire on the basis of information contained in the chronicles. Could we have identified Chan Chan as an imperial capital solely on the basis of archaeological remains? Comparison of Chan Chan with other Chuim urban sites points out archaeological remains that are specific to the capital. These remain in reference to possible differences in social organization in the capital as opposed to different parts of the empire. In conclusion, Chan Chan is compared with other known imperial capitals. (9)

Knoerl, John J. (SUNY-Binghamton) DATA RESOLUTION IN MEASURING SITE LOCATION IN HEAVILY VEGETATED AREAS: METHODOLOGY AND TECHNIQUES. Archaeologists and planners require accurate measurement of parameters such as site size and intrusive variability for research and management decisions. Often archaeological sites are located in situations where measurement of these parameters is costly. Since site resolution is highly significant, methods of determining site size and intrusive variability is a direct function of cost, the goal is to increase resolution while reducing cost. Shovel test pits (cylinders 30 cm in diameter) placed at regular intervals provide broad coverage and allow the observation of spatial data variation. Twelve sites in southeastern New York State, representing a majority of the area's known sites have been subjected to our shovel test pit methodology. The analysis shows great promise in increasing our ability to estimate site size and intrusive variability. (13)

Knudson, Ruthann (Idaho) ALICE IN WONDERLAND: THE EXPERIMENTS AND EDUCATION OF AN ARCHAEOLOGICAL NON-CHEMIST IN THE WORLD OF NON-OBSIDIAN LITHIC TRACE ELEMENT ANALYSIS. Neutron activation and x-ray fluorescence analyses have been conducted on materials from western Nebraska and the northern Rocky Mountains. This has been more in the nature of education and experimentation than in finished products, and it is now possible to outline the cost, time, sample preparation and array, and instrument needs of these analyses. With the development of a better understanding of data comparability, there is a wide array of sources, significant steps are being made in the use of non-obsidian trace element data in identifying prehistoric lithic materials. (43)

Knudson, Ruthann (see Sappington, R. L.) (11)

Kobori, Larry S. (see Seck, Susan M.) (S)

Koerner, Henry C. (California-Riverside) THE PRIMARY CULTURAL PROCESSES TOWARDS A UNIFIED GENETIC ANALOGUE MODEL OF CULTURE CHANGE. "Process" is a term that appears frequently in the terminology of scientific archaeology. However, the term itself has been little discussed, and subsequently its meaning remains unclear. A general definition of the term is proposed on this paper. Moreover, four primary cultural processes of culture change are identified in this study. These are based on a valid analogy with the four basic mechanisms of biological (phylogenetic) evolution, and their implication provides a basis for a unified genetic analogue model of culture change. It is maintained here that archaeology can productively study culture change in view of these concepts of the primary cultural processes. (8)

Kosakowsky, Laura (Arizona) LITHIC USE WEAR RESEARCH AT THE UNIVERSITY OF ARIZONA. This report discusses current research being carried out at the University of Arizona in lithic use research. Previous lithic use wear analysis has almost universally suffered from two major deficiencies: (1) the use of a single rock type for experimentation so that results are not necessarily comparable to other rock types; and (2) a lack of quantification of use wear so that experimental data cannot be objectively related to prehistoric materials. Our research has focused on defining measurable attributes of rocks that determine the formation of lithic use wear so that our results will not be limited to a single rock type. Furthermore, we are seeking and experimenting with techniques that will allow the quantification of use wear. (25)

Kowalewski, Stephen A. (CUNY-Hunter) GROWTH AND NON-GROWTH IN THE PAST AND PRESENT VALLEY OF OAXACA, MEXICO. Survey data from 260 km² surrounding Monte Albán, the ancient Zapotec city, show settlement patterns alternating through time between two modes, growth and non-growth, with associated demographic, hierarchical, and land use characteristics. This pattern for the 550 km² just to the south, but the modes are not completely synchronized with the central area. To explain this variability, a model based on optimal land use assumptions is evaluated. Results suggest processes similar to cases of uneven economic development in modern regions and have implications for the Colonial and contemporary Valley of Oaxaca. (29)

Kowaltski, Jeff Karl (Yale) THE ICONOGRAPHY OF THE CENTRAL MOTIF OF THE HOUSE OF THE GOVERNOR AT UXMAL. The iconography of the central motif of the House of the Governor has implications for the building's function and Uxmal's political role. Formal parallels to the central motif of the Governor's temple and hieroglyphic inscriptions of stelae at Piedras Negras. Figureine depicting Piedras Negras iconography were found at Tonina, while figureines from Isla del Carmen and Jaina present amalgamations of forms allied to Piedras Negras and Uxmal. Piedras Negras rulership symbols were transported to and persist at the House of the Governor, suggesting their application as symbols for political power and prestige of the lords of Uxmal. (27)

Krotzer, Paula Hohnberger (Veracruzana) DISTRIBUTION OF MAJOR CERAMIC WARES PRODUCED AT TEOTIHUACÁN. We will present new data on the ceramic industry of Teotihuacán during the Formative and Middle Preclassic phases. Identification of the principal workshop areas and a refined chronology based on the stratigraphic examination of the excavations will provide new information on the regions of origin for certain major wares that were produced and marketed in Teotihuacán during the two latter phases of the city's life. We will discuss San Martin Orange, Coarse Thin Orange, Copa, and Coarse Matte wares. (21)

Kus, James S. (California State-Fresno) THE PROGRAMA RIEGO ANTIGUO. For the past two years, the Programa Riego Antiguo has carried out a study of the prehistoric irrigation systems of the lower Moche Valley, Peru. Precise survey and mapping of the indigenous water management system has been accompanied by excavation and analysis programs that have provided information on hydrology, canal engineering, field and furrow design, and native crops. The research goal has been to outline the factors governing agrarian expansion, reform, and collapse, thereby achieving an empirical understanding of irrigation and its consequences. (17)
Kwamme, Kenneth L. (Colorado State) A MULTIVARIATE MODEL FOR PALEO-DEMOGRAPHY: A SOUTHWESTERN EXAMPLE. A general demographic model is presented that offers a procedure for estimating the size of prehistoric settlement populations. The model examines multiple measures of utilized space and through multiple regression relates these measures to population size. The demographic model is applied to recent data on the Southwestern Pueblos. Distributions in obtaining reliable census figures and spatial distribution are discussed. Several models are presented that offer the most precise and tenable estimates of pueblo population size yet available. Problems in the application of the models to prehistoric pueblos are discussed, and procedures used to test the viability of projecting a model into the past are examined. (45)

Ladd, Edmund J. (NPS) HAWAII ISLAND DRYLAND AGRICULTURE: Recent field studies in the Puu-Kau District of Hawaii Volcanoes National Park have revealed a variety of structures and features associated with what appears to be dryland agriculture. The field structures are examined and discussed on the background of traditional land use systems, population, environmental impacts, and historical adjustments. (14)

Lange, Frederick W. (Museo Nacional de Costa Rica) THE RUZI SITE: A LATE POLYCHROME OCCUPATION NEAR THE BAY OF CULEBRA, COSTA RICA. The predominance of Late Polychrome (1,200 to 1,600 A.D.) materials at the Ruiz Site near the Bay of Culebra contrasts with that of earlier periods in sites closer to the Bay. Subsistence and settlement data are contrasted with other Costa Rican and Nicaraguan sites in an attempt to elucidate patterns of regional adaptation. The recovery of a cire perdue mold fragment at the site, and the more recent finding of a small gold ornament in a nearby area, are the first positive evidence of the actual working of gold in the area. (32)

Lange, Richard C. (Arizona State Museum) SAMPLE CIRCLES: AN EFFECTIVE APPROACH TO SAMPLING LARGE SURFACE SITES. Sample circles can perform several functions as part of a sampling strategy for a site. As a form of sampling, this approach provides an alternative to a 100% collection of extensive sites. Problems that can be addressed are: boundary definition, assemblage composition, homogeneity, and distribution; and cluster size and location. Sample circles are particularly efficient means of dealing with such questions because they are easy to establish and are amenable to collection by several techniques with varying degrees of provenance control. (9)

Larralde, Signa (Denver) SHARED AESTHETIC TRADITIONS: POTTERY AND TEXTILE DESIGN RELATIONSHIPS IN ARIZONA, 1100-1500. It was hypothesized that: (1) well-established regional aesthetic traditions in Pueblo III Arizona resulted in ceramic and weaving products with designs similar to each other; (2) craftsmen in areas of cultural mix (i.e., Salado and Sinagua areas) produced ceramics and textiles with designs unlike each other and like the original traditions that inspired them. A design sample was coded using the Hatcher Art Analysis tally sheet. Results indicated significant regional consistencies in major and minor symmetry, layout, color, line and composition of design for both crafts except in areas of cultural mix, where these consistencies in design did not occur. (38)

Leach, Helen M. (Otago-New Zealand) MIND WITHIN MATTER: DISCOVERING THE TECHNOLOGICAL KNOWLEDGE OF EARLY NEW ZEALANDERS. The study of stone tools in New Zealand was long dominated by the classification of finished adzes whose varying patterns of flake scars had been determined by polishing. Excavation of an archeological locality on New Zealand provided an opportunity for establishing the complete production sequence of several adze types. A jigsaw analysis of a silcrete blade-manufacturing site of the same people showed that although production of prismatic cores involved a different procedure, similar skills were evident. Thus, a comparison of two distinct production sequences reveals a common core of stone working knowledge probably shared by other early East Polynesians. (39)

Leblanc, Catherine J. (see D'Alton, T. N.) (23)

Lees, William B. (South Carolina) FORM AND FUNCTION OF COLONO-INDIAN POTTERY IN AN HISTORIC PLANTATION CONTEXT. During the historic period, various Southeastern Indian groups in the region produced a trade ware currently referred to as Colono-Indian pottery. The precise forms and socioeconomic correlates of this ware are as yet poorly understood. An analysis of the intrastratigraphic variability of Colono-Indian ceramics from the Limerick Plantation Site (SBK223), an 18th and 19th century rice plantation in coastal South Carolina, was conducted, with the resultant data being compared to that from other sites on which Colono-Indian wares occur. This consideration of form and functional distribution indicates, among other things, a heavy reliance of Colonial and Antebellum populations of various ethnic origins on Colono-Indian wares. (46)

Lerner, Shereen A. (Arizona State) ANALYSIS AND FUNCTIONAL INTERPRETATION OF BLACK MESA CERAMICS. Formal differences between ceramic types are evident in a sample of rim sherds from ten sites excavated during 1977 by the Black Mesa Archaeological Project. Non-random association of physical attributes define the types. Functional interpretations of these associations are developed and then tested by examining the distribution of different types at both the intrasite and intersite levels. (22)

Levy, Janet E. (Kentucky) THE LINGUISTIC PREHISTORY OF CALIFORNIA: A PROCESSUAL VIEW. An argument is made for the use of historical linguistics in a processual framework. Linguistic change in Central California is examined with respect to interaction among language families and with respect to the social and ecological contexts in which linguistic change occurs. Attention is focused on six language families (Pomo, Western Miwok, Costanoan, Yokuts, Salinan, and Shasta) and the nature of the relations of these to each other and to the ecological context during the process of change. The expansion of these six language families is intimately associated with the cultural changes of the Late Horizon in Central California prehistory. (11)

Lewenstein, Sue (Arizona State) AN ANALYSIS OF EXPERIMENTALLY PRODUCED EDGE DAMAGE ON OBSIDIAN BLADES. In order to determine the prehistoric function of obsidian blades recovered from Classic period deposits at Pataria Island, Veracruz, Mexico, an experimental sample of obsidian blades was manufactured and used to produce a variety of raw materials presumably exploited by early Mesoamerican coastal groups. Subsequent to use, edge damage was collected for all 105 experimental tools. Factor and discriminant analyses have been successful in isolating wear patterns corresponding to several use categories. These results suggest the possible function of the Veracruz assemblage, both in terms of raw material and type of motion involved during use of the blades. (25)

Lewis, Kenneth E. (South Carolina) SETTLEMENT PATTERN AND FUNCTIONAL VARIATION OF THE SOUTH CAROLINA FRONTIER. The evolution of frontier settlement in the interior of South Carolina reflects adaptations to the attenuated social and physical environment present in the area undergoing colonization. Regional economic and subsidiary centers of wheat production were arranged in a dendritic pattern focused on the entrepots of Charleston and only with rare exception did substantial settlements arise that were not linked with this network during the frontier period. The archeological investigation of one linked center—Camden—and one non-linked center—Long Bluff—reveals variations that might reflect the functional differences of these two settlements. (3)

Lewis, R. Barry (Illinois-Urbana) RESOURCE DISPERSION AND HUNTER-GATHERER BAND SPACING. A hunter-gatherer site dispersion model is described which is based on the assumption that hunter-gatherers tend to maximize time and energy efficiency in staple food-getting. Predictions concerning the dispersion of hunter-gatherer sites with respect to aggregated and regularly dispersed resources are examined against data for Archaic hunter-gatherers in eastern Illinois. (47)

Lightfoot, Kent G. (Arizona State) FOOD REDISTRIBUTION IN THE PREHISTORIC SOUTHWEST. Recently several archeologists have examined intra- and inter-community food exchange within the prehistoric Southwest as a social process enabling people to subsist in an unpredictable environment. Within any year the productivity of a given plot of land may vary significantly with fluctuations in the pattern of rainfall, frost, wind, etc. The social networks linking communities enable food to be distributed from areas of relative abundance to those of scarcity. The problem posed in this paper is determining the maximum size of the social network in which food could be redistributed efficiently on a regular basis. The cost of transporting food by foot over various distances is used in determining this. (45)

Lightfoot, Kent G. (see Francis, Julie E.) (6)

Lim, W. Frederick (Indiana) SUBSISTENCE CHANGE AND OPTIMIZATION THEORY. Recent parallel theoretical and methodological developments in economics, economic anthropology, and archeology have provided the archeologist with the almost unique opportunity to develop an intensive synthetic body of theory to deal with the diachronic problems of subsistence change. Using such a framework in a preliminary form, the specific problem of differential utilization of resource zones by prehistoric groups with differing productive technologies will be examined using data from the riverine Midwest. (36)
Linford, Laurance (see Kosakovsky, L.) (25)

Lipe, William D. (Washington State) CENTRALIZED STORAGE AT MOON HOUSE, A PUEBLO III CLIFF DWELLING IN SOUTHEAST UTAH. The main building and occupation phase at this site of approximately 45 structures was in the 1200's; it was probably one of the last Pueblo sites on Cedar Mesa. The site's storage capacity evidently served a group larger than the few persons who lived there. It also seems to have been a focus for ritual activity, and a portion is still. Implications of these findings for interpreting the regional settlement system are explored. (30)

Long, Jeffrey C. (see Merbs, C. F.) (38)

Long, Jeffrey C. (see Utterchic, C. J.) (38)

Lopinot, Neal H. (see Canout, V.) (35)

Lord, Kenneth J. (Texas-Austin) VERTEBRATE REMAINS FROM HINDS CAVE: A COMPUTER METHODOLOGY. An extensive collection of vertebrate remains were recovered from the archeological excavations at Hinds Cave. This information consists of mammalian, reptilian, avian, and fish bones from all levels of the site. A computer program has been devised to quantify this information into stratigraphic levels in an attempt to recognize procurement and consumption patterns. These data will also be used as an aid in constructing a model of the past environment. (28)

Lucius, William A. (Archeological-Environmental Research Corporation) THE CENTRAL AND SOUTHERN COAL PROJECTS OF UTAH: METHODS AND RESULTS OF ANALYSIS FOR TWO LARGE-SCALE CONTRACTS. The amount and variety of data collected for the Central and Southern Coal Projects of southern Utah from the sampling surveys and research on previously recorded sites required implementation of computerized data storage and retrieval in order to evaluate the effects of coal development on cultural resources. With the aid of cross-tabulations for the various environmental and cultural variables, it was possible to produce statements on cultural historical, ecological, and social parameters of site location, and cultural affiliation of site types. These data, when used in conjunction with the other basic research undertaken for the project, resulted in predictive models of site type, location, cultural affiliation, and density given known environmental settings. (20)

Luedtke, Barbara E. (Massachusetts-Boston) TRACE ELEMENTS AND TRADE IN PREHISTORIC MICHIGAN. Trace element analysis of cherts can be a productive means of approaching numerous problems in prehistory, but like any other procedure it must be undertaken with care if valid results are to be obtained. This paper will assume that laboratory procedures are appropriate and that sources have been adequately characterized and will focus on the problem of assigning artifact samples to sources. Several methods of assigning unknowns will be discussed and compared. The resulting data are then applied to a study of chert distributions on Lake Michigan sites, developing trade networks and interaction patterns. (43)

Luedtke, Barbars (see McDonough, W.) (33)

Lynott, Mark J. (NPS) HUNTING AND GATHERING SITE TYPES AND ASSEMBLAGE VARIABILITY IN THE SOUTHERN ROLLING PLAINS. Analysis of hunting and gathering settlement systems has often focused upon forcing sites into generalized typologies. This approach has disguised the extreme variability that exists in hunting and gathering adaptive systems. Research in the Upper Colorado River drainage in west central Texas has been designed to evaluate the kinds of activities conducted at sites and to explore the variability of sites in regard to the interpreted activities. This approach revealed a significantly more complex functional situation than is frequently recognized in hunting and gathering contexts. (35)

Lyons, Thomas R. (NPS) NON-DESTRUCTIVE ARCHAEOLOGY AND REMOTE SENSING: A THEORETICAL AND METHODOLOGICAL STANCE. The concepts of a non-destructive approach to archaeology, which I believe to be of increasing importance as cultural resources management responsibilities mount in this country, are outlined and their scientific credibility explored. While archaeology has long relied on techniques that disturb and often obliterate prehistoric remains, research in non-destructive sensing has led to advances in methodological and technological research that influenced the development of this stance are defined, and conclusions are drawn concerning the role of specific techniques such as surface collection and excavation. (24)

Mack, Joanne C. (Oregon) A CERAMIC TRADITION FROM THE SISKIYOU MOUNTAINS OF SOUTHWESTERN OREGON. The ceramics from three archaeological sites along the Upper Klamath River in Oregon are described and the possible relationships between these ceramics and other ceramic traditions in western North America are explored. The pottery from these sites and other sites along the upper courses of the Klamath and Rogue Rivers has been named Siskiyou Utility Ware. From the evidence it seems to be an independent pottery tradition that may well have developed out of a California Ceramic Tradition base. (11)

Mackey, Carol J. (California-Northridge) A RE-EVALUATION OF THE NORTH COAST HUARI STYLE. The ceramic style referred to as both "Huari Norteno B" and "Red-white-black Geometric" emerged on the north coast after the fall of Huari. Survey and excavation in the Moche Valley advances that make a non-destructive color of low frequency and contemporary with Chimu style ceramics. The characteristics of three color red-white-black style are examined, and it is found that although the style is a marker for the end of the Middle Horizon, it is not necessarily an indicator of Huari/Pachacamac influence. (4)

Madsen, David B. (Utah) THE CONCEPT OF AN EARLY ARCHAIC: FACT OR FANTASY. Preliminary results of survey and test excavations in the Deep Creek Mountains in west central Utah indicate occupation of the area by at least four prehistoric groups. The most significant of these groups is the single occupation suggested by lithic techniques. Archaic and Sevier (formerly termed Fremont) occupations are found sequentially in test excavations of two rockshelters. A Goshute occupation is known historically and may be represented by Paiute-Shoshonean pottery at several sites. Dating of these sequences supports the thesis that there is no evidence of Archaic cultures in the eastern Great Basin prior to 860 B.P. Surface finds of fluted points and the presence of large herbivores, such as mammoths at 10,000 B.P. or later suggests that early sites in the eastern Great Basin may well represent Paleo-Indian occupations, rather than Archaic. (5)

Malcolmson, Richard D. (BLM Arizona Strip District) COMBINED EXTERNALLY BIASED AND RANDOM CLUSTER SAMPLE INVENTORIES IN THE VERMILLION ES AREA, NORTH CENTRAL ARIZONA. In preparation for the Vermillion Environmental Statement, proposed range improvement projects in the ES area were intensively surveyed, yielding a sample of 3,826 acres biased by range management considerations. An additional sample of 20,480 acres followed Mueller's "cluster scheme" strategy, using the township-range system rather than cultural or environment approach. This approach is economical, theoretically provides a small-scale replica of the universe being sampled, and allows a field test of Mueller's site data manipulations from the Pala Plateau (a part of the ES area). Analysis of the data uses Mueller's statistical approach, making the results comparable. (48)

Marmaduke, William S. (Museum of Northern Arizona) THE GROWTH AND DEVELOPMENT OF THE PREHISTORIC COMMUNITY AT COTTONWOOD SEEP. The Coronado Power Station railroad spur passes through Cottonwood Seep, a perennially flowing spring at the edge of the Puerco River valley. From A.D. 500 until A.D. 1300, the seeps district was continually occupied, but not uniformly so. This paper will identify the changes that occurred in the Seep settlement and will interpret the changes in terms of regional prehistory and ecological adaptations over time. Discussion includes both surveyed and excavated data. (42)

Marshall, Sydne B. (Columbia) THE PALEO-INDIAN COMPONENT OF SHAWNEE-MINISINK SITE, EASTERN PENNSYLVANIA. Discussion is made of analyses undertaken of Paleo-Indian lithic artifacts and ecological associations from the earliest cultural stratum at Shawnee-Minisink, a stratified, multicompartment site in eastern Pennsylvania yielding Paleo-Indian through Late Woodland components. The Paleo-Indian artifacts have been radiocarbon dated to 10,590 ± 300 B.P. (W-2994), 10,750 ± 600 B.P. (W-3134), and 9,310 ± 1000 B.P. (W-3388). Preliminary indications are that a limited range of activities were carried out at the site and the repeated use of locally available vegetal, riverine and lithic resources was a focal point for Paleo-Indian site occupancy. (35)

Maslowski, Robert F. (U.S. Army Corps of Engineers) MOOREHEAD CAGE CORDAGE ANALYSIS: ITS CULTURAL AND TECHNOLOGICAL IMPLICATIONS. Analysis of cordage specimens from Moorehead Cave, Val Verde County, Texas, resulted in the description of 10 types of cordage defined on the basis of fiber selection. Analysis indicated that twist patterns varied with fibrous components and manufacturing techniques. Attributions of utilitarian use could not change through time. The introduction of knotted netting and marine appendages accompanied by new fiber processing and cordage manufacturing techniques resulted in changes in twist patterns. (11)

Massee, W. Bruce (Arizona) THE HOHKOM OF THE SAN PEDRO VALLEY AND PAPAGUERIA: CONTINUITY AND VARIABILITY IN TWO REGIONAL POPULATIONS. The cultural history and subsistence and settlement patterns of two regional Hopian populations, the San Pedro Valley and the Papaguera, are briefly presented. Emphasis is placed on the variability within
and between these regions. The concepts of the Desert Branch Hohokam, Ooton and Dragon cultures are reviewed, focusing on the problem of identifying the mechanisms (e.g., migration and trade) by which Hohokam cultural manifestations appear in these two regions. It is suggested that substantial changes in social or subsistence patterns occurred at least three times during the Hohokam cultural sequence. These are delineated and factors responsible for their inception are postulated. (6)

Matson, R. G. (British Columbia) LOCA TIONAL DETERMINANTS OF CEDAR MESA CLIFF DWELLINGS. The locational model proposed is a linear, combinatorial one, based on the distance of the cliff dwelling from the river and from the village core, and the distance to adjacent cliff dwellings. In addition, a model of the relation between cliff dwellings and the landscape area is presented. This model is applied to the case of Cedar Mesa and compared with that of the full sample of Pueblo type II and III sites in this region, and with the sample of late Pueblo III sites only. In this way, the locational factors unique to the cliff dwellings can be examined, and the effects of cliff dwellings on the Pueblo III settlement system can be assessed. (30)

May, Ernest E. (see Canouts, V.) (5)

Mayer-Oakes, William J. (Texas Tech) BUREAUCRATS OR SCHOLARS—WHO CONTROLS ARCHAEOLOGICAL RESEARCH? Most archaeological research in the U.S. today is funded by Federal government agencies, as is most other scientific research. "Contract," or applied, archaeology has high priority and has elicited adverse publicity. Antiquities laws are being challenged. Some agencies request technical rather than professional services, foster mistrust by inter-regional contracting or consider cost alone. Costs escalate and basic research declined as governmental regulations increased. Archaeologists often characterize these trends and, as citizen-scientists, make individual commitments to providing bureaucrats and the public with greater understanding of the need for well-managed, publicly funded research, both applied and basic. (20)

McAllister, Martin E. (U.S.D.A. Forest Service) THE NORTHEASTERN PERIPHERY OF THE HOHOKAM CORE AREA: BIG TIME EXCHANGE OR SMALL POTATOES? Hohokam sites of the Colonial and Sedentary Periods are known in the area bounded by the Mazatzal Mountains on the west, the Mogollon Rim on the north, Canyon Creek, the Upper Salt, and Pinon Creek on the east and the middle Gila River on the south. A model is proposed that postulates a continuous relationship between the core area and the periphery. An hypothesis generated from this model will be tested using survey and excavation data from the area in question. Finally, the economic and socio-political implications deriving from the tests of the hypothesis are considered. (8)

McAllister, Shirley Powell (Arizona State) THE EFFECTS OF SEASONALITY ON SITE OCCUPATION. The proposal that a continuous relationship exists between the area a group occupies and the number of individuals in the group is questioned. It is suggested that the season of site occupation will affect the patterning of interior site space. Thirty-four Navajo sites of two known seasons of occupation and functions were mapped. Measures of interior and total site space from these sites are used to test the proposition that summer occupied sites will have proportionally and absolutely less interior space on them than will winter occupied sites. Implications of the findings for the interpretation of archaeological record are discussed. (22)

McAllister, Shirley Powell (see Rice, G. E.) (30)

McClung de Tapia, Emily (UNAM) PALEOETHNOBOTANICAL STUDIES IN MESOAMERICAN ARCHAEOLOGY. Paleoethnobotanical analysis was established as an integral part of archaeological investigations in Mesoamerica in the 1960's by Richard S. MacNeish but has not apparently progressed a great deal since then. Some of the problems faced by researchers in this area are considered, and some solutions proposed. Examples from recent paleoethnobotanical research carried out at Teotihuacan using data from excavations of Rene Millon's "Teotihuacan Project" are considered in relation to the problems as well as to the proposed solutions. (47)

McClurkan, Burney M. (see Snow, C.) (31)

McDonough, William (Massachusetts-Boston) LITHIC MATERIAL DEMAND AND QUARRY PRODUCTION. Quarrying is one way in which cultures dependent upon stone tools fulfill the demand for raw materials. While quarry studies usually focus on aspects of supply and production, it is useful to examine demand itself, as well. Demand will vary with technology, among other factors, and will have implications for procurement strategies, frequency and duration of procurement episodes, transportation, etc. This paper will present a simple model for calculating demand and will discuss the relevant variables. Ethnographic data from two stone tool-making cultures will be considered in light of this model. (33)

McGuire, Randall (see Kosakowsky, L.) (25)

McKinney, Charles M. (Heritage Conservation and Recreation Services) RECENT ANTIQUITY LEGISLATION INITIATIVES. The Department of the Interior has recently proposed new Uniform Rules and Regulations for the Antiquities Act. The background leading to this step, including a discussion of the impact of the Diaz decision, is reviewed, as are the proposed Uniform Rules and Regulations. The Committee is requested to comment on the proposed legislation and to suggest any changes. The Department of the Interior is discussed, and the feasibility of Freedom of Information Act exemptions for all sites covered under the Antiquities Act is analyzed. (12)

McLandress, Robert (Allen and Associates) AN ARCHITECT'S VIEW OF THE MESA VERDE CLIFF DWELLINGS. A question that has long perplexed both archaeologists and visitors to Mesa Verde is why the Anasazi of this region abandoned their mesa-top pueblos and built new villages in the cliffs during Pueblo III times. This paper proposes that the movement was caused by a combination of factors. The most important was that the microclimates of the selected rockshelters provided a more hospitable environment for the activities important at this time than did the climate of the open mesa top. (30)

McLaughlin, Diane E. (Arizona) A SHORT POLLEN CORE FROM NEAR THE LUBBOCK LAKE SITE, WEST TEXAS. Palynological information concerning the late Pleistocene environment of the Lubbock Lake site has been difficult to obtain. A short core was taken from a nearby location where it was believed that pollen would be better preserved. Geologic relationships of the core to the Lubbock Lake site are discussed. The pollen data may relate to a dry period, the Glazebrook Interval, at the Lake site. Some implications of these data for human occupation of the area from 10,000 to 11,000 years ago are suggested. (47)

McManamon, Francis P. (NPS) DISCOVERING NON-STRUCTURAL SITES IN THE EASTERN UNITED STATES: PAST AND FUTURE DIRECTIONS. Archaeological impact assessments for environmental impact statements and "Section 106" review, along with a growing interest in the reconstruction of prehistoric settlement systems, have influenced many archaeologists to consider explicitly the effectiveness of the techniques they are using to discover sites. The discovery technique(s) used in an investigation are one source of bias about which archaeologists must be concerned. Experiments and research comparing the effectiveness of different techniques, including relative costs, field conditions, or expected site characteristics are rare. However, some of the work to date indicates that particular techniques will be more useful than others in certain situations. (13)

McMillan, R. Bruce (llinois State Museum) ENVIRONMENT AND ARCHAEOLOGY IN SOUTHWESTERN MISSOURI. A few years ago plant geographers maintained that the biota of the Ozark Highlands has remained relatively stable since the Tertiary, even during the periods of maximum glaciation. During the 1980's a long-term interdisciplinary program was initiated to test this assumption as well as to study the interaction of prehistoric man with the natural environment through time. This research indicates that there were dynamic changes in the Late Quaternary landscape and ecosystem and these dynamics had a marked effect on the human inhabitants of that area. Discussion focuses on the history and aims of this program and serves as an introduction to the other papers in the symposium. (29)

McSwain, Rebecca (see Kosakowsky, L.) (25)

Mehringer, Peter J., Jr. (Washington State) THE STEENS MOUNTAIN PREHISTORY PROJECT. Through this project we hope to integrate the Holocene cultural and environmental history of an ecologically diverse and archaeologically rich region of southeastern Oregon. The archaeological data will come from two excavations, both of which are currently ongoing. The first excavation project, the Steens Mountain Project will result in two new excavations that will be performed to provide additional data for the Steens Mountain Project. The second excavation project, the Palaeoenvironmental Data Project, will be performed to provide a more accurate picture of the paleoenvironment in the Steens Mountain Project area. The two projects will be conducted concurrently and will be supported by the same funding. The results of these projects will be used to help understand the relationship between human and environmental changes in the Steens Mountain Project area. (6)

Merbs, Charles F. (Arizona State) HUMAN BURIALS FROM CHAVEZ PASS, COCONINO NATIONAL FOREST, ARIZONA. During the summer of 1977, human skeletal remains representing over 50 individuals were recovered from the Chavez Pass Ruin, a late "Sinagua" pueblo complex located approximately 35 miles south of Winslow, Arizona, on the Coconino National Forest. The material was recovered from the surface and from backfill left by pothunters. Preservation
resources that groups exploit according to the information they have of resource location. The rate and kind of information flow can structure a groups' efficiency of environmental exploitation. With this understanding, this paper models the flow of information on hunter-gatherer/agricultural frontiers, and makes predictions for the behavior of these social systems.

(2)

Moore, Josselyn F. (see Ford, R. I.) (22)

Moresu, Jean-François (Montreal) SOME PALEOECOLOGICAL CONSEQUENCES OF TWO VOLCANIC ERUPTIONS AS EVIDENCED BY THE MOLLUSCAN REMAINS OF A COSTA RICAN SHELL MOUND. The stratigraphic layers recently discovered in a Costa Rican shell mound suggest the occurrence of two prehistoric volcanic eruptions. The analysis of absolute and relative frequencies of molluscan populations, as well as some of the fluctuations of some metric attributes measured on these populations, suggest that these volcanic eruptions resulted in important changes in the ecological equilibrium of the intertidal zone of the Pacific coast of southwestern Costa Rica.

(32)

Morenon, E. Pierre (North Texas State) NEW EVIDENCE FROM THE JORNADA BRANCH: EXCAVATIONS IN THE ARROYO. NTU's recently completed research in the SC6 and the NPS on six archaeological sites in the Placitas Arroyo near the Rio Grande River, north of Las Cruces, New Mexico. Pithouses dating to 1,400 B.P., and various analyses, suggest non-traditional interpretations for the Jornada Branch of the Mogollon are proper. Sedentism occurs earlier, is associated with local and regional sites as opposed to large dispersed settlements. Evidence of pit houses with vessels and features is more widespread than previously thought. The results of this research are important for the interpretation of the Jornada Branch and the Mogollon culture. (45)

Morris, Don P. (Arizona Archaeological Center) SIGNIFICANCE OF CLIFF DWELLINGS IN CANYON DEL MUERTO, ARIZONA. Recent excavations at Antelope House and survey information from related cliff dwellings in Canyon del Muerto, Arizona, demonstrates that perishable materials from those sites provides unexcelled data for: (1) environmental base line studies; (2) direct weather and climatic effects on crop products; (3) processing and manufacturing techniques, among others. Sites containing these data are rare; their excavation should be approached systematically and carefully. Much material from the excavation will be unique and will require the accumulation of collection, analytical management, and curation to yield as much information as possible. (30)

Morse, Donald H. (see Merbs, C. F.) (38)

Morse, Dan (Florida State) CASE REPORTS. There are many more skeletons found on the surface than buried. When these cases are investigated, in order to best "recreate the event," care and accuracy are required. For illustration, the cases of three skeletons discovered recently in Florida are discussed. The most probable cause of death in the first case was natural, in the second, suicide, and in the third, murder. In all cases, archaeological techniques were applied and resulted in the recovery of significant information for the investigation of each case. (31)

Moseley, Michael E. (see Kus, J. S.) (17)

Mountjoy, Joseph B. (North Carolina-Greensboro) RESEARCHING THE PREHISTORIC OF THE TOMATLÁN RIVER VALLEY, 1975-1977. From 1975 through 1977 research has been conducted in the Tomatlan river valley of coastal Jalisco Mexico in order to recover information regarding prehispanic occupation before sites were destroyed by the Cajés de Peña dam and irrigation project. Some 50 kilometers of the river valley were investigated and 185 sites recorded. The sites examined were both residential and ceremonial conformed, and excavations conducted on the valley from at least 200 B.C. to A.D. 1579 is traced through four distinctive periods of development which reveal some of the processes involved in the evolution of a coastal valley cultural system. (40)

Myers, Thomas P. (University of Nebraska State Museum) THE FRINGES OF THE INCA EMPIRE. While ecological boundaries contribute to a non-circular pattern of culture traits, political influences, etc., human ecology rather than natural ecology is the critical variable. The expansion of empire is founded upon the conquest of sedentary peoples who are bound in place by capital investments in the modes of production. It follows that: (1) incorporation of developed areas is the primary objective of empire expansion; (2) underdeveloped areas will surround the empire; (3) underdeveloped regions within the empire were incorporated for strategic purposes. These hypotheses are tested against data from the northern and eastern edges of the Inca Empire, an extreme example of linear configuration. (23)
Nelley, James A. (Texas-Austin) THE ARCHAEOLOGY OF THE WS RANCH SITE, WEST CENTRAL NEW MEXICO: THE 1977 SEASON. An intensive surface survey of the WS Ranch site indicated its potential as a regional trade center and as a major occupation focus in the transition zone between the Pinelawn-Reservation and Mimbres Branches of the Mogollon. Test excavations were initiated to evaluate these potentials at this large, apparently badly footed site. The archaeological findings at this multicomponent site, occupied from A.D. 1000 to 1250, are complex. A statement of objectives for continued excavations at the WS Ranch site and a regional survey of the surrounding San Francisco River Valley and its tributaries will be presented. (45)

Nelley, James A. (see Turpin, S. A.) (45)

Nelley, Robert B. (SIUC-Carbondale) COMMUNITY ADAPTATION AND CHANGE ON BLACK MESA: A theoretical and methodological model is presented from which spatially distinct contemporaneous sites may be grouped into interacting communities. The nature and extent of a community's exchange spheres are seen as major factors in its capability to remain stable, or alternatively, to adjust to external change factors. It is from this perspective that adaptation and change on Black Mesa is examined. (22)

Nelson, Ben A. (SIUC-Carbondale) THE PROBLEM OF HYPOCOHERENCE IN SYSTEMIC ORGANIZATIONS PRECEDING THE NORTHERN BLACK MESA ABANDONMENT. The rapid but orderly abandonment of an aboriginally occupied area implies prior stress of some form on the cultural system. Given this proposition, the archaeological record should therefore bear evidence of adaptive shifts in the period preceding the ca. A.D. 1150 abandonment of large portions of Black Mesa. Such shifts would be reflective of the creation of additional buffering mechanisms to enhance the survival probability of the system. Evidence relating to this hypothesis is reviewed. It is argued that Rappaport's notion of hypercoherence may be valuable in explaining the failure of the hypothesized systemic reorganizations, and consequently, useful for interpreting the northern Black Mesa abandonment as an example of systemic maladaptation. (22)

Netherly, Patricia J. (SUNY-Fredonia) ARCHAEOLOGICAL IMPLICATIONS OF SOCIAL ORGANIZATION ON THE NORTH COAST OF PERU. The basic structure of the social organization of North Coast societies of the Late Intermediate and Late Horizon periods has been described. Males division is found to have been a fundamental organizational principle that was expressed in sociopolitical units at all levels. Examples of the manifestation of this duality in the material culture of the North Coast are presented using ceramic styles from Lambayeque and the settlement pattern associated with specific sites in the Chicama valley. The hierarchical implications of these expressions of duality are discussed. (9)

Neuman, Robert W. (see Byrd, K. M.) (46)

O'Grady, Patricia D. (see Karwedsky, R. A.) (46)

Ochel, Mildred (Cincinnati) CONDITIONS FOR ESTABLISHING DELIBERATE MODIFICATION OF LITHIC SPECIMENS. Traditional criteria for the recognition of human-made stone artifacts, based upon certain physical characteristics on flakes, can hardly ascertain the validity of deliberate, human modification in questionable cases. It is suggested here that a system of direct and/or circumstantial conditions, based on archaeological theory and practice, be substituted for these criteria. Clactonian occurrences in Britain serve as an example for the application of the suggested procedure. (44)

Okladnikov, Alexei Pavlovich (see Ackerman, R. E.) (44)

Oisen, Marion G. (Wisconsin-Milwaukee) SURFACE INVESTIGATION OF THE MACHALLLA COMPONENT AT REAL ALTO, ECUADOR. Slides showing the first evidences of an angular Machallla structure (ca. 1350 B.C.) and associated ceramics will be presented. Possible affiliations with other Machallla and Valdivian components will be discussed. These investigations are a result of survey and testing that was conducted in 1977 at the site of Real Alto and the surrounding area, and is part of an ongoing survey and excavation which will be continued in 1978. (17)

Oisen, Sandra L. (California-Berkeley) MICRO-WEAR ANALYSIS OF UTILIZED BONE FROM GRASSHOPPER RUIN, ARIZONA. This study attempts to distinguish wear patterns on bone implements which occur during manufacture from those that are introduced through use. Microscopic analysis and replication experiments were performed, in addition to ethnographic research into the functions of certain tool types. Through the decades, southwestern archaeologists have coined numerous terms of bone implements, which usually imply specific functions. The research on the utilized bone from Grasshopper Ruin is directed toward the goal of determining the range of functions applicable to each tool type and constructing a more accurate classification of southwestern bone artifacts. (38)

Olsen, Stanley J. (Arizona) SPECIAL PROBLEMS OF FAUNAL ANALYSIS IN THE MAYA AREA. Faunal analysis of sites within the Maya area pose problems not usually encountered elsewhere in the New World. Climatic variation, climate, and ecological conditions within a comparatively restricted geographical area. The vertebrates are of mixed Neartic and Neotropical origin. The avifauna is rather extensive due to the migratory flyway of the Central American corridor. Humid soil conditions and the close proximity of some of the larger Maya watercourses contribute to a considerable loss of bone material. These and other problems that confront the zooarchaeologist are discussed. (3)

Olsen, Gerald W. (Cornell) SOME PEDOLOGICAL OBSERVATIONS OF SOILS IN MAYA AREAS IN RELATION TO ARCHAEOLOGY. Soil characteristics which influenced and were modified by Maya populations are emphasized in this paper, with examples from fieldwork at locations including Tikal (in Peten Region, Guatemala), San Antonio (on Rio Hondo, Belize), and Valle de Naco (near San Pedro Sula, Honduras). Soils at each site were major resources that enabled initial development of increasingly complex settlements; growth of social organizations. Required considerable modifications of the soils; finally the technology of the time proved limiting to sustain the yields required from the soils to support the large populations. Pedological evidences of erosion, sedimentation, disturbance, depletion, and enrichment contribute significantly toward understanding of past events at each Maya site. (10)

Olsen, L. (see Tuggle, H. D.) (14)

Olszewski, Deborah I. (Arizona State Museum) MEMOIRS OF A MIDDEN. Preliminary results from the excavation of Arizona Public Service site CS-49, a small pueblos in Central Arizona, are presented. Emphasis is placed on materials recovered from the midden area. Indications are that primary cultural behavior must be considered in this area in order to refuse deposition. Detailed technological analysis of lithics aided in determining the plausibility of such activity. Furthermore, the presence of cultural features supports the premise of primary activity within the midden. It is therefore suggested that more emphasis be placed on nonarchitectural features within habitation sites. (19)

Padgett, Thomas J. (Arkansas) PROBLEMS AND PROMISE OF THE SMALL-SCALE ARCHAEOLOGICAL SURVEY—THE DEBATE IN THE SOUTHEAST. Small-scale archaeological surveys have inherent limitations that may restrict the usefulness of the data obtained. In the southeastern states, various attempts have been made to construct regional or state wide research designs to guide survey methodology and to provide interpretive frameworks for site survey data. Some of these attempts have been characterized as "pseudo-survey" by other workers in the area. Although certain criticisms are justified, the potential for small scale surveys to generate data relevant to regional problems should not be dismissed. The integration of site data is essential for the formulation and revision of productive research designs. (39)

Palais, Richard A. (Oklahoma) THE UPPER RIO SONORA VALLEY IN PREHISTORIC TRADE. Results of recent archaeological research in upper Rio Sonora valley are discussed, presenting data on local settlement-subistence patterns, non-subistence agriculture and related activities, community architecture, including the presence of possible ball courts, and the existence of a regional security in northeastern Sonora in later prehistoric times. A network of external trade, dominated by economic relationships with Casas Grandes, is postulated. (37)

Paradis, Louise I. (Montreal) THE POLITICAL STATUS OF THE TERRA CALIENTE OF GUERRERO, MEXICO: 1500 B.C.—A.D. 1500. The Tierra Caliente of Guerrero, Mexico, situated in the southwestern corner of Mesoamerica, is in an isolated geographical setting in relation to the rest of the cultural area. Archaeological and ethnohistorical research has confirmed a long sequence of human occupation in the region. An attempt is made to evaluate the political status of the Tierra Caliente throughout its history, to investigate the nature of the political relationships with other areas of Mesoamerica and to weigh the various factors responsible for them. (40)

Paynter, Robert W. (Massachusetts-Amherst) SPATIAL RESPONSES TO LONG DISTANCE PROCESSES: MODELS AND ASSUMPTIONS. This paper contributes to studying long distance interactions through the analysis of settlement patterns. The responses of settlement patterns have generally been models developed by regional economists and geographers. The limits to the use of models such as Central Place and Thunen landscapes are considered, particularly
with regard to their marginalist assumptions. This critique results in some positive suggestions for the space economy response in both capitalist and pre-capitalist stratified systems. (2)

Pears, Charles E. (Georgia) PREHISTORIC SETTLEMENT CHANGE ON THE GEORGIA COAST. The changes in the structure of prehistoric settlement systems through time are considered reflective of changes in a range of socio-cultural factors. Settlement data from two Mississippian period phases (Savannah phase, A.D. 1150—1350, and Irene phase, A.D. 1350—1550) on the Georgia coast are examined in an effort to characterize and assess adaptive differences and similarities between the two phases. (45)

Peabody, Christopher S. (Michigan) THE RIVER RAISIN ARCHAEOLOGICAL SURVEY, MICHIGAN. During the last three years, an 83.5% stratified-random sample of an 1129 m² watershed in southeastern Michigan has been completed. This survey involved interviewing collectors and amateur archaeologists and documenting their private collections (400+), resulting in a fine-scale reconnaissance of over 100,000 square miles. The resultant data yield measures of site density, variety, and distribution, as well as quantitative measures of site destruction. Approaches to and results of the survey are discussed, with special attention paid to the development of quantitative measures of site destruction. (12)

Percival, Stephen M. (South Carolina) THE EFFECT OF COASTAL PROCESSES ON COASTAL AND INLAND SETTLEMENT. Studies of coastal adaptation usually consider one phenomenon: sea level rise. This focus is often a methodology for assessing the representativeness of coastal settlement patterns through an analysis of the transgressions and regressions of coastal waters. Coastal processes are more complex and can be used in a more dynamic manner than this simple linear model. Their implications generate consequences for both inland and coastal settlement. (2)

Petigrew, Richard M. (Oregon) THE PREHISTORIC CHEWAUCANIANS: LAKE DWELLERS OF LAKE ABERT, SOUTHEASTERN OREGON. The discovery of a dense cluster of pit house villages along the shores of Lake Abert, in southeastern Oregon, is reported. Excavation in survey and test excavations strongly suggests that Lake Abert was the center of a lacustrine and marsh-oriented society approximately 4,000 to 1,000 years ago when increased precipitation made the lake and its drainage basin more biotically productive than today. This Chewaucanian Culture shows adaptive similarities, and perhaps affinities, with the lacustrine and marsh-oriented Klamath and Modoc of the contact period. The significance of the Lake Abert discovery is discussed. (11)

Pilots, Peter J., Jr. (USDA Forest Service) COLONIES, TRADERS, AND TRAITS: THE HOHKOM IN THE NORTH. Many writers have commented on the appearance of a complex of Hohokam traits in the Verde Valley and Flagstaff areas during the period A.D. 600-1100. Traditionally, this has been viewed as an organized movement of Hohokam lineages whose presence triggered significant changes in local cultural developments. This paper reviews existing data and questions the traditional interpretations. Other hypotheses focusing on demography and trade are offered to explain the phenomenon. Additional archaeological data needed to test these hypotheses are identified. (8)

Pitcher, Brian L. (see Hamblin, R. L.) (27)

Plog, Fred (Arizona State) THE NATURE OF HOHKOM CULTURAL CHANGE. Significant aspects of Hohokam settlement density and diversity are poorly described in the existing literature. Evidence pointing to a greater emphasis on settlement diversity as well as that of artifacts and of materials decreases the magnitude of change that occurred as Hohokam evolved. A continuity of evolutionary developments from pre-Hohokam Desert Culture populations in southern Arizona through the Hohokam Classic is suggested. Parallels between Hohokam cultural changes and contemporaneous changes in other parts of the Southwest are identified. (1)

Plog, Stephen (see Hartman, J.) (22)

PoL, John M. D. (see Smith, J. W.) (11)

Pohl, Mary (Florida State) FAUNA AS AN INDICATOR OF DIFFERENTIAL SOCIAL STATUS AMONG THE ANCIENT MAYA. An analysis of vertebrate faunal remains from five sites in Peten, Guatemala, reveals changing patterns of resource procurement from the Preclassic through the Postclassic Periods. This paper focuses on games as a status commodity. The effects of elite demands on the selection and distribution of meat are examined. (3)

Pollard, Hellen P. (SUNY-Plattsburgh) A RESEARCH DESIGN FOR THE STUDY OF THE PRO- TOHISTORIC TARASCAN POLITICAL SYSTEM. This paper attempts to address the implications of the research design of a project concerning the Protohistoric Tarascan political system. It shows how the use of models constructed from data in the modern and early historical periods and the awareness of the trajectory of culture change provided by the sequence of these models enables the authors to use available ethnohistoric and archaeological data for the protoliterate period economically and efficiently. (40)

Powens, Margaret (Museum of Northern Arizona) VARIABILITY IN PUEBLO BUILDING STRATEGIES IN THE CEDAR MESA REGION, UTAH. Architectural patterns at classic dwellings in the Grand Gulch Cedar Mesa Region of SE Utah are analyzed. Archaeological and ethnographic data are used to evaluate the contention that different physical settings call forth different construction strategies among Pueblo builders. Characteristics of building form and wood usage are seen to vary with different kinds of available building space. (39)

Pozorski, Shelia G. (see Kus, J. S.) (17)

Pozorski, Thomas G. (see Kus, J. S.) (17)

Precourt, Prudence S. (Wisconsin-Milwaukee) SITE SURVEY TECHNIQUES AND SUBREGIONAL SETTLEMENT PATTERNS: THE PUEBLA VALLEY. This brief report will review the field techniques utilized by the Pueblo Preclassic Project site survey crew in the completion of the intensive, controlled surface reconnaissance of the Puebla Valley. This includes the basic methods of site location, mapping, and artifact collection as well as sampling techniques and the rationale behind them. Several problems encountered in the conduct of the survey will be discussed along with their effects on the interpretation of the data. The pattern of site distributions derived from this data is considered. The deviations from the general model of Central Mexico Highland settlement which this example demonstrates are also described. (40)

Precourt, Prudence S. (see Fowler, M. L.) (49)

Price-Baggerly, Patricia (Hawaii) PRE-AGRICULTURAL HAWAII—A POSSIBLE MODEL. This model deals with the cultural adaptation of an initial settlement group would need to make to guarantee their survival in an unknown Hawaiian environment. It suggests that the colonizers did not choose the environments which were more intensively and intensively manipulated but rather chose more diversified areas which allowed a greater number of species to be exploited. It is suggested that early Hawaiians did not rely primarily on marine resources until horticultural self-sufficiency was achieved but rather also exploited in significant proportion both bird and native vegetable products. (14)

Purdue, James R. (Illinois State Museum) ENVIRONMENTAL IMPLICATIONS DERIVED FROM THE RODGERS SHELTER VERTEBRATE FAUNA. Vertebrate skeletal remains can potentially provide evidence of prehistoric climatic change. Traditionally, studies of this sort have emphasized the presence or absence of environmentally sensitive species. In addition to this, analysis of the Rodgers fauna, a multivariate statistical study of postcranial changes in bone morphology through time was instigated. Modern skeletal squires (Scelurus carolinensis and S. niger) specimens were collected from eastern Tennessee to western Kansas, i.e. mesic to xeric habitats. Cenozoic variation was found for both species. Morphological changes in squires from Rodgers from prehypothermal to hypothermal times, i.e. mesic to xeric regimes, corresponded in direction to that discovered for modern squires (26)

Purdy, Barbara A. (Florida State Museum) CONTRIBUTIONS TO ARCHAELOGICAL INTERPRETATION. The paper summarizes observations made at chert outcrop workshop sites in Florida and speculates about possible universal stone procurement practices. It is suggested that variations in procurement strategies can serve as time and space markers in much the same way that changes in debris or stone tool typology are used as index fossils. (33)

Purdy, Barbara A. (see Mock, D. R.) (43)

Reffert, Janet E. (Mississippi State) FUNCTIONAL ANALYSIS OF SURFACE COLLECTIONS, TOMBIGBEE RIVER, MISSISSIPPI. The potential of surface material collected during intensive survey of an area is often overlooked. Functional analysis of surface collections from sites along the Tombigbee River in Mississippi indicates that such collections can serve as an important source of evidence on settlement patterns and changes occurring through time and space. Hypotheses about the nature of such changes are partially tested using this data. (46)
Rands, Robert L. (SIU-Carbondale) PATTERNS OF CERAMIC EXCHANGE IN THE PALENQUE REGION, MEXICO. Ceramic exchange in the region of the Maya site of Palenque is indicated by technostylistic analysis. Relationships of form and functional attributes to technological data suggest the existence of sites or localities specializing in the production of different ceramic types. These were within the Palenque—what are termed—cultural area. In conclusion, explore the regional composition of its locally produced ceramics is critical in reconstructing intra-regional trade. Data are examined in accordance with central place-satellite model, in which varying patterns of ceramic exchange operated on different levels of sociocultural complexity. Specific examples illustrate integrative aspects of Palenque’s system of ceramic trade. (21)

Rasson, Judith A. (SUNY-Binghamton) INTERACTION SPHERES AS ADAPTIVE MECHANISMS. Interaction spheres may be interpreted as adaptive mechanisms maintained by the flow of information and resources between populations using shared symbolic elements to communicate the dimension of interest. Interaction spheres thus represent channels of communication for exploitations in times of social or economic stress. (44)

Ratliff, Evely C. (see Knutson, P. H.) (21)

Reeves, Brian O. K. (see Smith, J. W.) (11)

Reid, J. Jefferson (Arizona) TO SOOTHE THE SALVAGE BEAST. Research, budgets, logistics, and all that we hold dear in conservation archaeology are a matter of impacts. Emphasized in this regard is the crucial relationship between valid research and clear understanding of the range impacts to cultural resources. A classification of impacts is presented, impact identification procedures are discussed, and avenues of investigation to increase our perception and predictive abilities are suggested. A consistent, coherent approach to impacts must prevail if conservation archaeology is to overcome a salvage past. (12)

Reidhead, Van A. (Missouri-St. Louis) SIMULATING OPTIMAL RESOURCE USE IN SUBSISTENCE CHANGE. This paper examines linear programming as a technique for simulating optimal resource use strategies under conditions of change. Using a nutritional model and subsistence data from the Midwest, the paper examines the application of linear programming at a number of levels including: (1) the value of the technique in explaining changes in resource use patterns, (2) its use in analyzing the impact of alternate subsistence strategies, and (3) practical aspects of employing the method. (36)

Reitz, Elizabeth J. (Florida State Museum) ANALYSIS OF FAUNAL REMAINS FROM ST. AUGUSTINE, FLORIDA. St. Augustine, located on Florida’s northeast coast, was founded by the Spanish in 1565 as a military garrison. The Spanish followed a subsistence strategy incorporating both domestic and wild resources in their diet. The faunal remains are analyzed in order to understand the Spanish adaptation to their coastal environment and the use made of the domestic animal resources. (46)

Reyman, Jonathan E. (Illinois State) THE PREDICTIVE DIMENSION OF PRIESTLY POWER. Pueblo priests used esoteric knowledge to predict seasonal changes and astronomical events, and their power increased or diminished with their ability to “control” such phenomena. Inaccurate predictions often resulted in discord and possibly in charges of witchcraft. The use of this ethnographic/ethnohistoric model for studying prehistoric Anasazi sites is discussed, especially with reference to Mexican origins for the Pueblo complexes. (37)

Rice, Don S. (see Deneve, E. S.) (10)

Rice, Glenn E. (Arizona State) THE INCORPORATION OF SMALL CONTRACT PROJECTS INTO A REGIONAL SAMPLING DESIGN. The question of integration of small archaeological contract surveys into a regional research design is considered. Using incomplete, objective universe of the greater Phoenix area, small projects done by Arizona State University will be examined to determine the nature of project locational bias. While areas encompassed by small clearance projects vary considerably in shape, size, and distribution, it is argued that they must be treated as sampling units within the regional framework if the data they produce are to be useful. Since small clearance surveys will seldom approximate statistically valid samples of a region, guidelines for evaluating the extent and direction of the biases in such controlled samples are suggested. (39)

Rice, Glenn (see Upham, S.) (1)

Rice, Prudence M. (Florida) POSTCLASSIC POTTERY PRODUCTION AND EXCHANGE IN THE CENTRAL PETEN, GUATEMALA. Postclassic pottery from the Central Peten, Guatemala, shows some degree of stylistic homogeneity, but variability in pastes suggests a number of manufac-

Riley, Carroll L. (SIU-Carbondale) THE IMPACT OF MESOAMERICAN INTERACTION ON HOKAM CULTURE CHANGE. This paper examines the problems of Hokokam-Mesoamerican contacts from the vantage point of the early 16th century. Utilizing both ethnohistorical and archaeological data, I survey the socio-political and economic organization of indigenous groups, and the nature of Mesoamerican contacts both in the two areas and more importantly—in such nearby regions as the northern portions of the Sierra Madre Occidental and the adjacent Sonoran lowlands. These data, combined with archaeological interpretations of the Hokokam proper and from pre-Spanish west Mexico provide new insights into the nature of Mesoamerican interaction with the Hokokam. (1)

Riley, Thomas J. (Illinois-Urbana) THE PEOPLING OF HAWAII. Models of the development of the chidrom in Hawaii have been proposed, with increasing population pressure an implied but unstated influence. This paper is an attempt to trace several possible population trajectories for the Hawaiian islands, and to try to fit one or more of these models to the known archaeological and Hawaiian population estimates offered by the early European explorers. (14)

Robertson, Patricia Crown (Arizona) SOUTHWESTERN CERAMIC CLASSIFICATION: NEW INSIGHTS FROM THE CHODISTAAS SITE. Archaeological investigations at the Chodistaas site (AZP1424) in east-central Arizona have revealed a 20 room pueblo with an occupation span of 15 to 25 years based on tree-rim and ceramic dating. The five rooms excavated have produced 1350 identifiable sherds apparently recovered from the apparently unburned pueblos. These vessels include a number of standard types whose occurrence at the site may raise significant chronological questions. The collection displays stylistic uniformity among the sherd types present. Interesting relationships have emerged through comparison of household inventories of vessel numbers, forms, and types. (38)

Rogers, R. (see Hay, C. A.) (27)

Rogge, A. E. (Bureau of Reclamation) SPATIAL ANALYSIS OF SURFACE SHERD AND LITHIC SCATTERS. The ever-increasing number of intensive cultural resource management surveys in the American Southwest has led to the discovery of more and more undetected subaltern surf and lusitl scatters. New analytical strategies must continue to be developed to glean more of the information potential embodied by these types of low-density archaeological resources. This report explores the usefulness of dimensional analysis of variance for documenting the spatial structure of a sherid and lichit scattered located adjacent to the Salt River in central Arizona. Problems encountered are described and potential solutions and alternative analytical approaches are discussed. (15)

Roth, Arthur (Wichita State) HISTORY AND POTENTIAL OF STUDIES OF THE SOUTHWESTERN CLIFF DWELLINGS. A review of early cliff dwelling studies and a discussion of their contributions to the development of southwestern archaeology in general and to some current research emphases in particular. (30)

Romero, Angeles (see Josserand, J. K.) (49)

Root, Dolores (Massachusetts-Amherst) HUNTER-GATHERER SOCIAL ORGANIZATION AND UTILIZATION OF VARYING ENVIRONMENTS. Often archaeological settlement pattern models focus on pattern rather than variability. Thus, modern patterns of hunter-gatherer social organization and utilization of a landscape are generated. It is argued that social organization reflects the resources and occupation of resource procurement depending on the patch structure of resources in space and time. The Tlingit's and the Kutchin's utilization of a predictable and clustered resource, migratory fish, is examined and compared to the variation in abundance, availability, and predictability. Social organization reflects and amplifies the magnitude of resource fluctuations in an environment. Archaeological implications are considered. (47)

Root, Dolores (see Gero, J. M.) (13)

Roper, Donna C. (Missouri-Columbia) SETTLEMENT-SUBSISTENCE SYSTEMS IN THE TRUMAN RESERVOIR AREA. Recent intensive survey and excavation has documented the same 10,500 year span of occupation throughout the Truman Reservoir and is as seen at Rodgers Shelter—i.e., Plainview through Late Woodland and Central Plains-like manifestations. This paper briefly considers regional trends in spatial distributions of recognizable and identified components.
The analysis is set within the framework of a behavioral model of human interaction with the natural environment and documents the statics and dynamics of settlement pattern changes in the central Osage River Basin. (26)

Rose, Martin R. (Arizona) THE EXTENSION AND QUANTITATIVE RETRODICTIO OF INTRA-ARTIFACT PLASTIC VARIABILITY ON THE PREHISTORIC HOMAN SITE. A study of the feasibility of reconstructing paleoecological variables such as precipitation, temperature, and the P.D.S.I. (an integrative hydrologic accounting measure) is demonstrated by current dendroclimatic research. Calibration, verification, and retrodiction procedures, and the concepts of response and transfer functions are elaborated. The necessity for numerically modeling time series of merged archaeological and recent tree-ring indices during years of common overlap is indicated as: in the time domain with autoregressive (AR), moving average (MA), or mixed ARMA equations, and in the frequency domain with power (variance) spectrum techniques. The potential of such reconstructions is illustrated with an example from Arroyo Hondo and Santa Fe, New Mexico. (47)

Rosenberg, Bettina H. (Salt River Project) ELECTRICITY GENERATES ARCHAEOLOGY: A UTILITIES ROLE IN CONTRACT ARCHAEOLOGY. The construction of a coal-fired generating station in St. Johns, Arizona and its associated features, created the need for intensive archaeological investigations. Salt River Project, a water and power utility in Arizona, contracted with the Mobil Oil Co., for all of the Coronado Project-related studies. Based on federal and state antiquities requirements, and SRP's own archaeological resources policy, reconnoissance and intensive studies and mitigation procedures were undertaken for all aspects of the project. Sites identified which could not be avoided were excavated at the plant and evaporation pond (collections of land), 100 miles of transmission lines, a 45-mile railroad, wellfields, and a water pipeline. (42)

Rosendahl, Paul (Bishop Museum) THE IMPACT OF EARLY HAWAIIANS ON THEIR ISLAND ENVIRONMENT. The thesis to be considered is that the impacts upon and modifications of the island environment by the early Hawaiians differed quantitatively, and not qualitatively, from modern impacts and modifications, and that the relatively smaller scale modifications effected by the early Hawaiians were not for want of trying but were limited by available technology and sociocultural influences. This thesis is developed in greater detail, and the archaeological and other relevant evidence for early Hawaiian impact on their island environment is examined and evaluated. (14)

Rosenthal, E. Jane (Arizona) REGIONAL SHELL EXCHANGE IN THE ARIZONA PACIFIC. The shell trade processes are explored utilizing sources, destinations, and exchange methods. Historic and ethnographic data is reviewed to determine the nature of shell trade patterns in the central, northern, and southern regions of the United States, including those of the Gulf Coast and the West Coast. The shell trade systems of the Pacific Coast, the Gulf Coast, and the Great Lakes areas are also discussed. The analysis of the shell trade systems is based on the examination of the cultural and ecological factors that influenced the development of shell trade systems in the Pacific Northwest. (38)

Rothschild, Nlan (CUNY-Hunter) THE ONDERONK SITE: AN HISTORICAL CONTINUUM. An early 18th century Dutch House in Queens, N.Y., shows a variety of occupations that reflect changing patterns of land use in its immediate environment. The site ranges from farming to space-age rocket technology, all of which are reflected in the archaeological record. The site also demonstrates the value of excavation in a highly disturbed setting, and has an interesting role as a focal point for community organization. (39)

Rozen, Kenneth C. (see Dickerson, J. L.) (19)

Rubertone, Patricia E. (SUNY-Binghamton) AN ARCHAEOLOGICAL APPROACH TO COMPLEX SOCIETIES USING MEASURES OF CERAMIC VARIABILITY. Ways of measuring and describing forms of social organization in complex archaeological sites are discussed. Previous studies of ceramic variability and social organization have not fully examined the various kinds of information contained in these materials, nor have they presented adequately a means to relate ceramic variability to organization in a complex society. Analytical strategies presented involve looking at different kinds of information in ceramic attribute data and using these measures as evidence of different kinds of interaction networks in the community. (6)

Rudicoff, Christine A. (see Findlow, F. J.) (33)

Salwen, Bert (NYU) ARCHAEOLOGY IN MEGALOPOLIS: UPDATED EDITION. Because of the "disturbed" nature of the terrain, archaeologists working in built-up "urban" situations frequently underestimate the possibilities for the survival of useful archaeological information. Recent experience, most of it in connection with federally-managed historic resource surveys, has demonstrated that such disturbances are often quite superficial, and that important sites and features may exist, intact, beneath them. In fact, since all human activity "disturbs" the locale in which it occurs, the evidence of past construction and destruction may be the very resource that gives the area its historical and cultural importance. This paper presents examples of successful recovery of archeological data in urban contexts in the northeastern United States, and discusses some special emphases and methodologies that are appropriate in these situations. (7)

Salwen, Bert (see Rothschild, N.) (25)

Sanabria, Laura (see Dickson, D. B.) (27)

Sanders, Lois E. (Oklahoma) PHYSICAL AND CULTURAL VARIABLES AFFECTING PHOSPHATE DEPOSITION AND PRESERVATION AT ARCHAEOLOGICAL SITES. Physical and cultural variables involved in the deposition and preservation of organic phosphate-containing debris at archaeological sites are discussed. The physical factors include soil pH and clay or mineral content of the soil. Cultural variables include the type of site, the spatial arrangement of activity areas within the site, and cultural values. These variables are briefly discussed for the temporarily or seasonally occupied site, 34-Pw-63. (40)

Sappington, Robert Lee (Idaho-Moscow) THE LYDGE GULCH SITE, SHOSHONEAN ADAPTATIONS, AND NORTHERN GREAT BASIN PREHISTORY. A small concentrated open site was excavated in the Boise River canyon during summer 1977. Two components are present: a Lydgel (10AA72), the upper one with Late Period obsidian tools and debitage, bone tools, and "Shoshonean" fingertip-impressed pottery. The lower component, apparently 3,000 years old, includes points comparable to Great Basin Archaic forms. The site is particularly important for its excellent preservation of food remains—muscle shells; hackberry seeds; deer, rodent, bird, and fish bones. Analysis of 10AA72 provides data complementary to previous information about Northern Great Basin adaptations from cave and rockshelter sites. (11)

Satsungan, Nqamptu (Missouri-Columbia) PLAINVILLE IN TRANSITION. In the last century and a half, the village has passed through five critical periods. The first two (1830-1865 and 1865-1900) can be described as closed, isolated, and self-sufficient. During the third and fourth (1900-1940 and 1940-1955), Plainville underwent significant sociocultural changes. Modern technology, increasing control by federal government and the process of "urbanization" were all external forces contributing to opening Plainville to the outside world. During the fifth period (1955-1977), which is most crucial, Plainville can best be described as a "retirement community" threatened by the culture and values of "foreigners." (26)

Saul, Frank P. (Medical College of Ohio) MAYA SOCIOCULTURE AND ECOLOGY AS RECORDED IN THEIR SKELTONS. The skeletal remains of the Maya themselves, provide many opportunities for the direct and indirect examination of the sociocultural and ecological concerns of these twin Symposia. Data derived from our intensive studies of the inhabitants of Altar de Sacrificios, Seljuk, Guatemala and Tancab, Mexico and Cuello (Belize) and our survey of other Maya populations (especially Chichén Itzá, Mexico) will demonstrate the importance of studying such seemingly unrelated esoterica as linear enamel hypoplasia, ossified superosteal hemmorhages, spongy/poroic hyperostosis, femur length, Carabell's Gusp, etc. The time span involved ranges from the earliest Maya of 2600 B.C. to the present. (3)

Saul, Julie Mather (see Saul, F. P.) (3)

Savage, Howard (Royal Ontario Museum) FAUNAL FINDINGS IN CAVE SITES IN BIZIE. Lime- stone cave sites in Belize, in use during the Late Classic Period mainly for ceremonial purposes, show considerable faunal material. Numerous faunal artifacts probably had a ritual use. Drilled dog teeth are particularly numerous at Actum Poblache. Food items: e.g. deer, brocket, paca, tapiro, bobwhite, guan and gallinule, are relatively uncommon. Remains from cave-dwelling fauna are abundant. (5)

Schaect, Robert M. (Wayne State) THE DEVELOPMENT OF IMPERIAL INSTITUTIONS. Few 20th century comparative analyses of pre-industrial empires rival the comprehensive studies of Toyne and Emmerich. Both, however, have not recovered the full importance of their studies, however, contain significant insights into the development of "imperial institutions" relating to communication, garrisons and colonies, provincial organization, capital cities, official languages and scripts, legal systems, standardized measures including money, military organization, civil service, citizenship, and religion. This paper will summarize and evaluate their findings. (23)
Scheidel, Richard P. (Texas-Austin) PERMANENT AND TRANSIENT DIAGNOSTICS OF THE MIDDLE HORIZON IN THE CENTRAL ANDES. Since its first established the Tiahuanaco phase as a pan-Peruvian phenomenon, the study of what could best be called an iconographic cluster has been used as a diagnostic to separate "early" from later manifestations of what were generally labeled as local cultures or cultural continuities. This paper attempts to sum up most of the diagnostics that have been identified, place them according to different locations, and to indicate which of these diagnostics is "instructive" or "insufficient" and whether it is permanent, i.e. resulted in a transformation of the affected cultural continuum. (4)

Schafer, James (Arizona) DAYS OF WINE AND ROSES: THE BYZANTINE OCCUPATION OF THE NEGEV DESERT. The political and economic circumstances of imperial control can stimulate population growth in areas of marginal agricultural potential. This can be seen in the Negev Desert, formerly the "Ter with a Frontier Province of Palestine in the Byzantine period (4th-7th centuries AD)." Large prosperous communities are associated with agriculture, administered trade networks and military protection, despite marginal, unpredictable rainfall, and Bedouin raids. The analysis of mass produced amphorae from the site of Byzantine Jemmeh will be presented as an archaeological indicator of resource flow networks which were available to these frontier settlers. (23)

Schein, Cheris (Museum of Northern Arizona) THE NATURE OF ARCHAEOLOGICAL TRANSECTS IN REGIONAL STUDIES, PART I. The Museum of Northern Arizona has intensively studied 47 archaeological sites impacted by the construction of the Coconino Power Station railroad spur which runs between the Puercos River valley and the Little Colorado River valley. The peculiar transect nature of the project presents advantages and disadvantages in the interpretation of archaeological data. Part I discusses the theoretical and methodological aspects of regional studies involving purposeful transects. Advantages and disadvantages are identified, and the effects upon the meaning of data are assessed. (42)

Schade, Linda (South Alabama) THE PLANTS AND ANIMALS OF THE SARCOPHAGUS SIDES AT PALAQUE: Ten figures representing seven individuals are portrayed on the sarcophagus sides in the Temple of Inscriptions. These individuals have been identified as ancestral persons who are present in temporal and genealogical order. The iconography of the sides includes animals and floral motifs. The plants include avocado, cacao, chloako, nance, and guava. These are still used as local sources in the Palenque region today and may well have been food sources during the Late Classic Period. (3)

Schiffer, Michael B. (Arizona) SOME CHARACTERISTICS OF INFORMATION FLOW IN ARCHAEOLOGY. Despite recent and rapid growth in archaeological publishing outlets, it is becoming more and less difficult to do research that incorporates the latest advances on any particular subject. Some reasons for this apparent paradox are explored in the context of a general treatment of information flow in archaeology. Some remedies are suggested. (6)

Schimmer, Sarah (Washington State) LIMITS TO GROWTH IN PUEBLO III CLIFF DWELLINGS: AN EXAMINATION OF EIGHTY'S MODEL. A recent analysis of several Pueblo cliff dwellings located in the Anasazi region of the American Southwest indicates that growth was probably limited by density dependent factors such as carrying capacity. Because social factors or available building space may impose limits at individual sites, an attempt will be made to examine growth patterns in clusters of sites at the regional level. This level would seem more appropriate for discussion of the limits to growth based on carrying capacity. (30)

Schreiber, Katharina J. (SUNY-Binghamton) PLANNED ARCHITECTURAL UNITS OF THE MIDDLE HORIZON: VARIATIONS ON A THEME. The point has often been made that architectural forms associated with the Huari "state" of the Middle Horizon Period are quite distinctive, especially as regards the degree of "planning" required in their construction. Architectural data from the recently excavated site of Jinchamoco, a Huari state administrative center located in southern Ayacucho, are presented in order to arrive at a more refined sense of Huari site planning. The remains of other Middle Horizon sites in the south are charted with a point to the distinctiveness of regional, temporal, and functional variations of this basic theme. Finally, these data are viewed in light of a model of communication networks and hierarchies indicative of similar organizational political organization. (4)

Schutt, Jeanne A. (New Mexico) ARTIFACT RECOVERY PROCEDURES AND MICROWEAR PATTERNS. Microwear pattern analysis is still in an early stage of development. Many scientists are working to replicate wear patterns observed on lithic artifacts recovered in the field, with the hope of determining how they were used in the past. This paper will address the problem of the creation of wear patterns through standard archaeological field recovery procedures. A range of commonly encountered lithic materials will be processed through three stages of recovery, including screening, transportation, and laboratory processing. (25)

Schaedle, Richard P. (Texas-Austin) PERMANENT AND TRANSIENT DIAGNOSTICS OF THE MIDDLE HORIZON IN THE CENTRAL ANDES. Since its first established the Tiahuanaco phase as a pan-Peruvian phenomenon, the research of what could best be called an iconographic cluster has been used as a diagnostic to separate "early" from later manifestations of what were generally labeled as local cultures or cultural continuities. This paper attempts to sum up most of the diagnostics that have been identified, place them according to different locations, and to indicate which of these diagnostics is "instructive" or "insufficient" and whether it is permanent, i.e. resulted in a transformation of the affected cultural continuum. (4)

Schafer, James (Arizona) DAYS OF WINE AND ROSES: THE BYZANTINE OCCUPATION OF THE NEGEV DESERT. The political and economic circumstances of imperial control can stimulate population growth in areas of marginal agricultural potential. This can be seen in the Negev Desert, formerly the "Ter with a Frontier Province of Palestine in the Byzantine period (4th-7th centuries AD)." Large prosperous communities are associated with agriculture, administered trade networks and military protection, despite marginal, unpredictable rainfall, and Bedouin raids. The analysis of mass produced amphorae from the site of Byzantine Jemmeh will be presented as an archaeological indicator of resource flow networks which were available to these frontier settlers. (23)

Schein, Cheris (Museum of Northern Arizona) THE NATURE OF ARCHAEOLOGICAL TRANSECTS IN REGIONAL STUDIES, PART I. The Museum of Northern Arizona has intensively studied 47 archaeological sites impacted by the construction of the Coconino Power Station railroad spur which runs between the Puercos River valley and the Little Colorado River valley. The peculiar transect nature of the project presents advantages and disadvantages in the interpretation of archaeological data. Part I discusses the theoretical and methodological aspects of regional studies involving purposeful transects. Advantages and disadvantages are identified, and the effects upon the meaning of data are assessed. (42)

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Siemens, Alfred H. (British Columbia) MAYA RAISED FIELDS IN A BROADENED CONTEXT: Maya raised fields and related features on the two flanks of the Yucatan peninsula will be placed into a wider context within tropical lowland Middle American in order to aid the analysis of their chronology and function. Vestiges of comparable agriculture occur in a neighboring culture region, occupying calm-water enclaves within more volatile river systems. Their consideration should enlarge understanding of the pre-Colonial agriculture in the particular areas as well as the hydrological basis of raised field agriculture in general. It may perhaps permit a kind of analytical triangulation with what is known of agricultural development in Central Mexico. (10)

Silberbauer, F. B. (see Van Der Merwe, N. J.) (47)

Simmons, Alan H. (Arizona State Museum) MOVE THAT DIRT AND PASS THE BUCK—THE NEW MERCIENARIES? In some circles of archaeology two rather unfortunate trends seem to be emerging. First is that many credit members, especially students, have become increasingly mercenary in their attitudes toward a discipline that has never been particularly profitable nor suited to an eight-hour day. Second, this mercenary attitude is frequently coupled with an ideology in which the general public is concerned with the glamour of field and lab work in archaeology. A survey of public involvement in these aspects is presented, and recommendations are offered on how to involve the general public and maintain top quality professional studies. (16)

Smith, Jack, Jr. (Texas-Austin) RECAYU ICONOGRAPHY AND MIDDLE HORIZON STYLES. Middle Horizon iconography as usually interpreted excludes Recayu motifs, considering them to be exclusively produced and to have had their influence in near terminal periods. For Recayu may have extended well into Middle Horizon, and the consequent influence of Recayu motifs on Huari-associated stylistic inventories may have been much more pervasive than has been acknowledged in the hitherto published literature. This paper attempts to demonstrate this thesis. (4)

Smith, Jason W. (Robert S. Peabody Foundation) THE MISSION RIDGE SITE: A PRE-WISCONSIN HUMAN OCCUPATION ON THE SOUTHERN CALIFORNIA COAST. A site was discovered consisting of a possible beach associated with stone artifacts after a survey of the Mission Valley in San Diego. Brian Reeves and two Quaternary geologists from San Diego State identified the deposit containing the artifacts as a Sangamont interglacial soil dating to 70,000 B.P. Subsequently, over 20 quartzite artifacts were excavated from one cutting tool, several choppers, clefts, and other artifacts. In this short note of these finds, a case for an early Upper Pleistocene human presence in North America will be made followed by a discussion of the significance of poorly defined industries now found throughout the world. (11)

Smith, John P. (New Orleans) THE FORMS OF PATOLLIS: THEIR INTERRELATIONSHIPS AND SOME SYMBOLIC ASSOCIATIONS. In the years following Taylor's late 19th century study of Patollis, a Mesoamerican board-game, additional types of Patollis have been discovered. New ideas concerning religious associations of the game have been proposed. This paper will summarize these developments and will offer tentative hypotheses concerning relationships between different forms of Patollis and some underlying cosmological symbols. (40)

Smith, Marion (see Hanson, G.) (13)

Smith, Michael E. (Illinois-Urbana) A COMPARATIVE PERSPECTIVE ON THE AZTEC MARKETING SYSTEM. Aspects of the peasant marketing system in the Valley of Mexico during late Aztec times is compared to analogous ethnographic and historically known systems from around the world. Models drawn from the work of Carol Smith and others in the field of anthropological analysis are applied to the data on Aztec exchange in an attempt to further our understanding of the Aztec economy. The Aztec market is shown to be comparable in many respects to known complex interlocking central place systems, and the implications of this are briefly discussed. (40)

Smith, Randall M. (see Merbs, C. F.) (38)

Snehurt, Michael J. (Museo Nacional de Costa Rica) THE EARLIEST CERAMICS FROM COSTA RICA: LA MONTANA, A MIDDLE FORMATION SITE ON THE ATLANTIC WATERSHED. The La Montana ceramic complex, from a site near Turrialba on the Atlantic watershed of Costa Rica, is the earliest known from the country and demonstrates the presence of sedentary agricultural communities by at least the Middle Formative (500-1000 B.C.). While La Montana exhibits ceramic motifs and forms from both Mesopotamia and the northern South America and Mexico, the former tradition seems to dominate at the site. (17)

Snow, Clyde F. A.A.—Civil Aeromedical Institute) THE CUMMINS PRISON EXCAVATION. In 1956, three skeletons were disinterred by unskilled labor at Cummins Prison Farm in southeast Arkansas. Before forensic examination, it was announced that the skeletons: (1) were those of convicts murdered by guards in the mid-1940's, (2) displayed evidence of antemortem violence suffered in the mid-1940's, and (3) represented only three of as many as 3,000 convicts killed and secretly buried at Cummins. State officials hastily claimed the grave was a cemetery existing prior to the establishment of the prison farm in 1902. Professional investigation has refuted both theories, demonstrating that much confusion could have been avoided had the excavation been conducted in a scientific manner by persons trained in archaeology and forensic anthropology. (31)

Snow, Cordelia T. (NPS) REMOTE SENSING OF IMPACT ON CULTURAL RESOURCES. The principal focus is on the conservation of cultural resources and artifacts, whenever possible, so that the data they contain may be available for future study. Although it has been obvious from the beginnings of archaeology that natural and post-depositional cultural processes are to a great extent responsible for the preservation and form of prehistoric sites, they are currently being changed by human activities. In the future, the impact of cultural resources are often difficult to measure. Remote sensing techniques provide a means of monitoring subtle changes in cultural resources that may affect scientific conclusions drawn in the future; methods by which such monitoring can be efficiently applied over both short and long time periods will be outlined. (24)

Speth, Carl D. (Illinois-Urbana) EL MUERTO ROCK SHELTERS: A STUDY IN NONCERAMIC CULTURE ON THE GUAYAS COAST, ECUADOR. Many prehistoric archaeological studies on the south coast of Ecuador have been based on a cycle of Early Period collecting. By sampling in this region, particularly over the last three to four millennia, new information from the El Muerto Rock Shelters in the ProLas Posorzo zone and a reassessment of previous work in the area suggest not only continuous occupation since the Pleistocene, but that evidence of the movement of these cultures is indicating migration rather than post-conquest period, and unrelated to climatic fluctuation. (17)

Spier, Laurence M. (New Mexico) SOME GEOGRAPHIC TECHNIQUES AND THEIR APPLICATION TO INTRASITE SPATIAL ANALYSIS. Isolation of spatially differentiated activity areas composing archaeological sites has become the focus of an increasing number of studies. Approaches to the analysis of spatial distribution of artifacts have, however, often lacked a coherent methodological framework. It is suggested that geographic methodologies could facilitate empirical generalizations and serve as a basis for further systematic modeling of intrasite activity areas. Using techniques of map projection and cartography are applied to the problem of intrasite spatial analysis. Examination of the ability of these techniques to alter the portrayal of a set of plots is discussed. Particular emphasis is placed upon the use of these techniques as foundations for deductive modeling to aid in archaeological explanation. The well established use of these methods in geographic research constitutes a previously accepted approach which is inherently applicable to similar problems encountered in archaeological research. (6)

Spilhaus, Ronald H. (Miami-Ohio) TRACE ELEMENT ANALYSIS: A SUGGESTED KEY TO THE IDENTIFICATION OF MILL CREEK AND HARTLINE CHERTS. Discrimination between two different chert varieties, the Mill Creek and the very similar reds are defined by their relative iron content. The chemical analyses utilized neutron activation analysis have indicated that such is possible on the basis of well-defined cement composition. (43)

Spitzer, Michael G. (SMU) PREDICTING WORKPIECE HARDNESS FROM MICROFLAKE SCARS ON ORTHOGONAL CUTTING TOOLS. An experiment conducted to allow construction of a predictive equation to solve for workpiece hardness for orthogonal cutting tools is discussed. The experimental design and relevant variables are briefly described, and the results obtained for
predicting workplace hardness are addressed. The results provide strong encouragement for the construction of a more refined functional typology for orthogonal cutting tools than has been attempted before.(25)

Spruk, Larry J. (Historical Surveys, Inc.) THE EFFECT OF DISPLACEMENT ON RURAL PEOPLE IN MISSOURI'S OSAGE RIVER BASIN. Using characteristic tape excerpts the presentation will attempt a portrayal of feelings among rural Missourians who have moved or will move prior to impoundment at the Harry S. Truman Dam Project. The effect of moving upon different age groups will be studied as will the degree to which the length of family history in the area affects attitudes and opinions regarding displacement. Included in these areas of analysis is the question whether rural land ownership in the area gives the people a heightened sense of place or identity with the land and, if so, to what extent are the beginnings of estrangement being felt.(26)

Staford, Barbara A. (Arizona State) A TECHNOFUNCTIONAL ANALYSIS OF PAYSON LITHICS: A NEW METHOD. Morphological approaches to lithic typologies provide little data as to manufacture and utilization. To determine modes of manufacture and utilization, a microwear analysis has been completed on lithic assemblages collected from a series of a habitation and limited activity sites located near Payson, Arizona. Quantification of hinge and invasive fractures per artifact according to a 6-polar grid constituted the major portion of the microwear analysis. Quantification of these modes of use, relative hardness of the material worked and modes of manufacture. Factor and cluster analyses grouped artifacts according to the degree of accumulated damage. Supplementary data (i.e., pollen, distribution, ecological) were used to differentiate further activity sets that varied as to site type and environmental location.(25)

Staford, Barbara A. (see Stafford, C.R.) (25)

Stafford, C. Russell (Arizona State) THE IMPLEMENTATION OF EXPERIMENTAL DESIGN IN LITHIC STUDIES. As experiments in lithic technology have become more frequent, a number of important issues have arisen. It is argued that the use of the methodology of experimental design be employed to increase efficiency, control exogenous variables, and improve comparability between studies. Formal experimental designs can further be employed to reduce the cost/benefit ratio. Theoretical expectations and effect size are critical in the selection of an appropriate experimental design. These effect sizes have consequences in the determination of sample size, power, and the relationship between significance tests and measures of correlation. Various experimental designs applicable to lithic studies will be discussed.(25)

Staford, Thomas (see McLaughlin, D.E.) (47)

Sternberg, Robert (see Eighty, Jeffrey) (6)

Stickel, Gary (see Koerner, H.C.) (6)

Stoerkere, Terry (Illinois-urban) TEZCATLIPOCA AND QUEZTLACOATL. The confrontation between Tezcatlipoca and Quetzalcoatl is analyzed with Wallace's paradigmatic model for explaining culture change which is predicated on an ideological conflict that ultimately serves to justify the abandonment of one cultural orientation and the adoption of other values. The confrontation between Tezcatlipoca who advocated human sacrifice and the losing god who opposed human sacrifice is interpreted as a local point which might have facilitated an increasing institutionalization of militarism and heart sacrifice in Mesoamerican culture history. Diachronic archaeological evidence is presented.(40)

Stoutamire, James W. (Florida State) FORENSIC ARCHAEOLOGY: A COURSE OUTLINE. Florida State University has conducted classes in Forensic Archaeology since 1976. During this time, we have refined the course design and content. Lecture emphasis has been placed on archaeological technique, osteology, bone pathology, identification of remains, collection and preservation of evidence, search techniques, and various aspects of criminal investigation. Field experience has consisted of the excavation of prepared graves utilizing plastic skeletons and associated personal evidence of criminal activity. In association with the field experience we have conducted experiments on the preservation of evidence in the field.(31)

Stoutamire, James W. (see Karwasky, R.A.) (46)

Straus, L. G. (see Clark, G.A.) (54)

Struweer, Stuart (Northwestern) PRIVATE SUPPORT OF ARCHAEOLOGY: THE NORTHWESTERN UNIVERSITY EXAMPLE. As the demands of modern archaeology increase the financial require-
mony for either specific important individuals or for all the individuals that died the previous year. Cremated burials are indicative of this specialized mortuary practice for high status individuals; thus, the nonrandom pattern of associated artifacts indicates ascribed status. Central and peripheral activity areas are defined based on the spatial distribution of trade materials and soil testing. Astronomical alignments of projectile points support the cardinal directions ethnographically recorded with the Shoshonean mortuary ceremony. (11)

Taylor, Richard (see Hanson, G.) (13)

Terrel, James A. (Eastern New Mexico) QUANTITATIVE ARCHITECTURAL ANALYSIS AT GUADALUPE RUIN, SANDOVAL COUNTY, NEW MEXICO. A methodology for recording of architectural variability has been developed from previous research. The approach incorporates both traditional aspects of architectural analysis, i.e., masonry typologies, abutment studies, etc., and relatively new techniques, i.e., architectural attribute and analysis. Utilization of the attribute analysis provides a quantitative basis for the estimation of stabilization requirements and allows the use of multivariate statistical procedures for the delineation of architectural subpopulations. Data collected from a sample of 183 ceramic attributes for single and multiple samples of cultural materials may be used to test defined subpopulations for cultural significance. Application of the method at Guadalupe Ruiz provides a backdrop for discussion of the sampling procedures, attributes measured, and the problems and limitations of the method. (15)

Terrel, James A. (see Baker, L. L.) (6)

Thomas, David Hurst (American Museum) A PRELIMINARY REPORT ON PALEO-INDIAN SETTLEMENT PATTERNS AT PLIESTOCEAN TONOPAH. Systematic regional surveys in the Reese River and Monitor valleys have disclosed a relatively stable upland-stone tool scattering system which began about 7,000 to 8,000 years ago, and survived into the ethnographic present. Earlier settlements in the central Great Basin are known to have clustered about Pleistocene remnant lakes, and a recent systematic random sampling survey was conducted to determine the nature and extent of these Paleo-Indian settlements near Pleistocene Lake Tonopah. We discuss the sampling design and present some tentative findings from the artifact analysis and microwear studies. The paper concludes with some preliminary thoughts about the major settlement shift from lowland to highland occupations in the central Great Basin. (6)

Thomas, George B. (North Texas State) SURVEY METHODS AND SETTLEMENT PATTERN AT FORT HOOD, TEXAS. Six years of amateur archaeological survey on a military reservation are discussed, with emphasis on methods and research designs. Acting under archaeological survey permit authorization from the Department of the Interior for two of these six years, the Fort Hood Archaeological Society surveyed portions of the 217,000 acres (339 sq. mi) of Fort Hood property in 1977 for site distribution. Under varying capabilities of supervision, the survey methods emerged. A tentative settlement pattern study on the basis of chronologically diagnostic artifacts (projectile points) and terrain context showed trends similar to those elsewhere in central Texas. (35)

Thomas, Trudy (American Museum) MICROSCOPIC AND STYLISTIC ANALYSIS OF FOUR HUNDRED INCISED STONES FROM GATECULLY SHIELD, NEVADA. Four hundred incised limestone slabs were recently excavated from datable levels of Gatecullly Shield, a pictograph cave in central Nevada. The mass of incised stone yielded by this site, taken together with a second collection of approximately 400 additional incised stones found by surface survey in the Monitor Valley area, makes it clear that incising of non-utilitarian materials was a major traditional activity in the Basin for thousands of years. This paper offers a microscopic and macroscopic approach that is yielding data about formation of designs, order of marking, and other structuring information. (5)

Thompson, Donald E. (Wisconsin-Madison) STRUCTURE-FUNCTION IN PRECOLONIAL VILLAGES IN THE PERUVIAN NORTH HIGHLANDS. Late Pre-Columbian villages along the Upper Maranon drainage are described and speculation are made as to structure-function and community organization. The starting point for such speculation will be villages studied earlier in the Egyptians in the Department of Huánuco. The latter communities are better understood because of early ethnohistorical data provided by the visita of Ifigo Ortiz de Zuñiga and other sources. (9)

Thorn, Alston V. (Texas Tech) CONTRACT ARCHAEOLOGY, RESEARCH DESIGNS AND INTENSIVE SURVEYS. This paper discusses the concepts of and relationships among contract archaeology, research designs, and, in particular, intensive surveys. The related goals of these aspects of contemporary archaeology are addressed. Specific contract projects from several regions are used as subject matter. Attention is given to the development of these projects from the RFP/proposal stage to the final report. Special consideration is given to time/money constraints of the various intensive surveys and their resulting data bases. The paper also explores both theoretical and practical repercussions of different approaches to intensive surveys conducted under the auspices of contract archaeology. (20)

Thorburn, Peter (Brown) SITE SURVEY IN NEW ENGLAND: A FIELD EXPERIMENT IN SAMPLING THEORY AND METHOD. A 25-kilometer highway right-of-way in southeastern New England has been surveyed twice by two different investigators. The first used a stratified sample of the sample and the second used a random sample. The results indicate that the former was subject to serious biases due to the nature of the sampling method and the latter provides a more feasible approach. (15)

Reim, John R. (Trent) CLASS, PRESTIGE, BUREAUCRACY, AND AUTHORITY IN PRE-INCAIC PERU. This paper will briefly discuss the advantages of reconstructing elements of class, prestige, ideology, and information flow in complex societies, and the kinds of data that may be used for such reconstructions. An analytical framework will be presented which relates social structure to factors leading to cultural complexity. The paper will then examine how the analytical framework can be used to understand the increasing complexity found in the cultural sequence at Chan-Chan. (9)

Reim, John R., (see Topic, T. L.) (17)

Reim, Theresa L. (Trent) FORTIFICATION SYSTEMS OF NORTHERN PERU. In the summer of 1977, a program of location, survey, and mapping was begun on fortified and defensively located sites in the vicinity of Ollanto, Peru. The aim of the research is to trace the development of militarism in northern Peru, plot shifts in the borders of prehistoric states in the area, and examine changes in coast-sea interaction through time. The survey, combined with air photo study, has located 300 probable fortified features, indicating an unexpectedly great preoccupation with defense, particularly toward the end of the prehisric sequence. (17)

Ronningen, Robin (Sheffield) PRODUCTION FOR EXPORT AT THE MELIAN OBSIDIAN QUARRIES. Virtually all the obsidian found on prehistoric sites in the Aegean c.800-3000 B.C. was initially quarried at one of either of two source areas on the Cycladic island of Melos, identifying the production area is important because it is intimately related to the production area. Operating on the exchange system as a whole, Quantitative and qualitative study of the debitage at Sta Nychia and Dhemenag has demonstrated that prismatic blade core preforms (macrocores) were the major quarry products. Differences in activity patterns between and within communities are also investigated. A working model of the obsidian exchange system is suggested. (33)

Rogge, H. D. (Hawaii) THE APPLICATION OF THERMOELINESCENCE TO PROBLEMS OF DATING AND SOURCING HAWAIIAN VOLCANIC GLASS ARTIFACTS. The primary dating method now used in Hawaiian archaeology is the hydration rind measurement of volcanic glass artifacts. Research on the dating of glass by thermoluminescence is now ongoing. If successful, this will provide an independent assessment of the age of geological and some archaeological specimens of volcanic glass. In addition, thermoluminescence is also being explored as a means of "fingerprinting" volcanic glass artifacts may be identified with source or quarry areas. (5)

Rown, Sarah Peabody (Rhode Island) ALTERNATIVE APPLICATIONS OF THE MEAN CE- RAMIC DATE CONCEPT FOR INTERPRETING BEHAVIOR. By illuminating inconsistencies between material culture chronology and historically-documented occupation periods, South's Mean Ceramic Date concept may be employed as a tool for furthering interpretation and examination of human behavior in three categories: intrasettlement, intersettlement, and intersettlement. The results of this quantitative study of several artifact categories at Boston's Fort Independence illustrate the use and limitations of the concept as a tool for cultural explanation. The quantitative approach to ceramic analysis is combined with qualitative considerations of artifacts, features, and stratigraphy in testing three hypotheses and reaching an explanation consistent with past lifeways at the 1803-33 fort. (35)

Tumbea, William A. (Rhode Island) FLOODING AS A TRANSFORMER OF THE ARCHAEOLOGICAL RECORD. Acknowledging that the archaeological record represents the product of complex interactions between natural and cultural processes over time, this paper focuses on the relationship between geomorphological stream-activities and archaeological field evidence.
An inquiry based upon some 226 prehistoric sites in north-central Pennsylvania suggests the degree to which flooding, erosion and deposition (N-transforms) may affect the discovery, recognition and interpretation of archaeological units in the vicinity of streams. Data from this study are further utilized in an attempt to address questions of past human behavior regarding settlement location in relation to streams (C-transforms) and demonstrates that a better understanding of stream dynamics may have some predictive potential for field archaeologists. (35)

Turnbaugh, William A. (see Turnbaugh, S. P.) (35)

Tumer, Christy G., (Arizona State) THE DENTITION OF THE CHILEAN CERRO SOTA-PALLI AIKE CAVES INDIANS AND THE PEOPLELING OF THE AMERICAS. Teeth and tooth socket morphology of 11 cremated individuals, found with extinct sloth and horse remains, between 8,700 and 11,000 B.P. show a north Asian affiliation for these Paleo-Indians, and suggest trait stability to the present day. Traits shared with north Asians and modern Indians are incisor chipping and subincisiv-chipping, 1- and 2-rooted upper 2 molars, 1-rooted upper first premolar, 1-rooted lower first molar, 3-rooted lower second molar, and 3-rooted lower third molar, among others. This complex did not occur in European Upper Paleolithic or Neolithic peoples suggesting north China to southeast Siberia as the homeland of Paleo-Indian culture and people. (17)

Tirpin, Solveig A. (Texas-Austin) TEMPORAL AND SPATIAL VARIABILITY IN PREHISTORIC GREAT KIVAS OF THE MOCOLLEN REGION. Mogollon Great Kivas, assumed to be well defined and cultural manifestations amenable to modal analysis, are analyzed using a series of computerized statistical programs. Variability and gaps in the archaeological record dictate that Great Kivas be seen from a psychosociologic perspective. Techniques for the extraction of temporal variability are used to preserve the spatial integrity of data in order to verify or rule out the boundaries of the Mogollon "Branches." (45)

Upham, Steadman (Arizona State) UP THE CANAL WITHOUT A PATTERN: MODELLING HOHKAM INTERACTION AND EXCHANGE. The hypothesis that the degree of interaction increased through time in the Hohokam cultural tradition is examined. Test implications are derived in that increase in interaction is to changes in the distribution of ceramic attributes, settlement location, and irrigation systems. Data from the Salt River Valley and environs are used in the analysis. Some of the dramatic changes that occurred from pre-Classic to Classic periods are examined as a function of changes in the organization and intensity of interaction. (11)

Utermohle, Charles J. (Arizona State) HOHKAM BURIALS FROM THE SALT RIVER VALLEY, ARIZONA. Recent archaeological work in the Salt River Valley, Arizona, especially at the AZ UBA-13 site located in Tempe, has produced data from over 30 burials representing the Classic and Sedentary periods of Hohokam. This paper will describe the burial practices observed and the skeletons recovered. Much of the skeletal material is well preserved by Hohokam standards and lends itself nicely to biological analysis. Of special interest is the age-sex profile of the individuals relative to dental and skeletal pathology including caries, osteo-arthritis, biliary and severe developmental defect of the first cervical vertebra. (38)

Vander Leest, Barbara (Wisconsin-Milwaukee) THE RAMEY FIELD, CAHOKIA SURFACE COLLECTION: SOME PRELIMINARY RESULTS. This report is a discussion of the ongoing analysis of a controlled surface collection from the Ramey field area of the Cahokia site, east St. Louis, Illinois. Ramey field lies approximately in the center of the Cahokia site, just east of Monks Mound, the largest prehistoric structure north of Mexico. The surface collection covers over 41,000 square meters and includes one quarter of a million artifacts. The use of computer plotting routines to trace the distribution of various artifact types and ceramic attributes has shown extraordinary potential. Preliminary results have identified a number of features and functional site selection which had previously been unknown. Differential use of some areas through time is also evident. (35)

Van der Merwe, Nikolaas J. (Cape Town) CARBON ISOTOPES AND THE INTRODUCTION OF MAIZE. The effects on 14C/C ratios in human bones resulting from the introduction of a C4 cultigen (e.g., maize) into temperate environments has been demonstrated for a sample of 10 skeletons from New York. The method is confirmed by results on 20 skeletons (muscle, 10 female, 10 female, aged 25 years) from the DuPont Site, 33 HA 11 (Late Archaic, c. 2500 B.C.) and an identical from the McLeod Site, 33 HA 19 (upper Mississippian, 1300-1000 B.C.). The DuPont material shows a 14C depletion of about 21% per mil, indicating zero intake of C4 plants; the McLeod material is depleted by 12 per mil, equivalent to a diet that includes 50% of C4 plants. Implications of results from other Ohio and Illinois sites are described. (47)

Van Rinsvelt, Henri A. (see Mock, D. R.) (43)

Vogel, J. C. (see Van der Merwe, N. J.) (47)

Vokes, Arthur W. (Arizona) THEY DON'T MAKE THEM LIKE THEY USED TO. The Island of Cozumel, lying off the northeastern coast of the Yucatan Peninsula, was the location for the joint University of Arizona and Harvard University survey and excavation program between 1972 and 1974. Over 200 sites were addressed in the analysis of the recovered materials is to determine what trends can be discerned in the techniques and forms of manufacturing used by the island's inhabitants. It is felt that the artifacts created with shell, one of the few locally available natural resources, is an ideal medium for the study due to the volume of artifacts recovered. (3)

Volman, Kathleen (see Freeman, L. G.) (34)

Volman, Thomas P. (Chicago) MIDDLE STONE AGE ARTIFACT VARIABILITY IN THE SOUTHERN CAPE, SOUTH AFRICA. In southern Africa recent paleoanthropological research has begun to shed some light on the nature and evolution of resource exploitation in the Upper Pleistocene and Holocene. Sites of very early Upper Pleistocene age in the region have provided the earliest evidence in the world for the systematic exploitation of marine resources. Both marine and terrestrial faunal remains indicate that the last 200,000 years were characterized by important long-term changes and regional differences in subsistence strategies. This paper reports some aspects of the technological component of these changing adaptations, based on the analysis of Middle Stone Age artifacts assemblages from sites in the southern Cape Province, South Africa. (34)

Vreeland, James M. (Texas-Austin) THE MOCHE-HUARI CULTURAL INTERFACE: TEXTILE TECHNOLOGY AND ICONOGRAPHY OF A SLIT TAPESTRY FUNERARY GARMENT. The recent discovery of a high-status Peruvian mummy bundle has yielded an elaborate wool and sate tapestry mantle found wrapped directly around the body of a naturally "mummified" male about 40-45 years old. The distinctive iconographic and technical attributes of this fabric might well be expected to provide a useful perspective on the nature of cultural interfaces in the area. In an effort to identify these contributions of the Mocheoid and Huari (and other possible) components, the stylistic and technical analysis of this garment will include a brief critical review of the diagnostic textile features of these two periods. (4)

Waide, Robert B. (Wisconsin) THE EFFECT OF SLASH-AND-BURN AGRICULTURE ON THE AVIFAUNA OF SOUTHERN CAMPECHE. The successional stages of vegetation that occur after abandonment of a milpa support very different bird communities. Moreover, a large number of species that exist in mature forest do not occur in disturbed or successional habitats. While in
some cases subsistence farming may enhance the populations of some bird species by providing more edge habitat, a more intensive agricultural system usually results in decreased diversity and abundance. Data from Campeche are used to demonstrate these points. (10)

Wait, Walter K. (NPS) THE SMALL SURVEY IN REGIONAL INTERPRETATIONS: THE SAN JUAN DATA BASE PROJECT. In an effort to demonstrate the utility of small surveys in developing strategies of cultural resource evaluation, the Southwest Cultural Resources Center, National Park Service, has inaugurated a project that should provide information on all archaeological surveys and sites recorded for the 30,000 square mile San Juan Basin (New Mexico). It is estimated that at the end of collection phase of the project, over 30,000 sites and 30,000 survey miles will have been coded for computer analysis. This paper will discuss the status of the project, mention its implications for future cultural resource management assessment and demonstrate how the small survey can play a vital role in regional archaeological interpretation. (39)

Walker, Deward (Colorado) USE AND ABUSE OF EThNoGRAPHERS IN CULTURAL RESOURCE MANAGEMENT. Following current antiquities legislation, archaeology has assumed the role of ethnography in the description and presentation of North American culture history. ’History’ has assumed responsibility only for its historic European remains. Therefore, we must ask who is concerned with the proto-historic and ethnographic periods. There is no ethnographically oriented program within current cultural resource management project designs or funding priorities. Thus, an apparent result of the cumulative antiquities legislation has been to formally exclude ethnographers and to diminish new ethnographic research in conjunction with cultural resource management. Is this wise? (12)

Walker, Geoffrey (Michigan) HUMAN IDENTIFICATION: QUANTIFICATION AND RECOGNITION OF SKILL FRAGMENTS IN FORENSIC ARCHAEOLOGY. Human bone analysis concerns age, sex, and ethnic group classifications, and depends on their state of preservation. Gravestones are grouped into two types: (1) ancient burial sites—identification and reconstruction of living forms is more an art than a science in this area. (2) modern burials—favorable conditions for cranial patterns make it possible to compute sex, age, and ethnicity back. DNA is not suited to discriminate between blacks, whites, and Indians. Our method will compute the size and shape of missing skull fragments and build a complete skull representation within known limits. Though human variation causes some questioning of the reliability of these methods, they provide a powerful tool for recognition and classification, improving as data accumulates, and providing the forensic archaeologist with a compass in a biological and sociological wilderness. (31)

Walker, Terry (Edge of Cedars Museum) ML-1147, AN UNDISTURBED CLIFF DWELLING IN SOUTHEASTERN UTAH. This undisturbed PII cliff site was discovered by USFS personnel in 1965. Recent partial excavation of the site revealed that it had 21 definable structures and 15 "utilitarian" use areas. These features appear to be organized into room clusters and habitation units, which may represent a localized lineage settlement pattern. Tree-ring studies indicate that most of the construction was in the 13th century and that roof beams were cut during the growing season. There is strong evidence, however, for winter occupation of the site. (30)

Wapnish, Paula (Smithsonian) THE ZOOARCHAEOLOGY OF EMPIRES. The hypothesis that Tell Jemmeh, located in the northern Negev, is the garrison city of Arza mentioned in the annals of Esarhaddon, king of Assyria (690-686 B.C.), has been advanced on architectural and artifactual evidence. Excavation can be tested by the faunal remains collected at Tell Jemmeh. The proportions that the various species contributed to the sample is a measure of the interaction of the site with the rest of the Assyrian Empire. Changes in the animal management systems documented at Tell Jemmeh measure the needs of a military encampment for outside supply. (23)

Washburn Dorothy K. (California-Berkeley) A REANALYSIS OF THE GRAVE GOODS FROM PUEBLO BONITO: SOME MEXICAN AFFILIATIONS. A problem in determining the affiliation of a number of Pueblo II burials excavated at Pueblo Bonito (New Mexico) is resolved by utilizing a new vessel form (cylinder jar) and a new vessel form (cylinder jar) prompting a reexamination of the other associated grave goods in several unusual graves in Pueblo Bonito. This paper discusses the similarity of sandals from representations of Post Classic Maya and skeletal deities with those painted on a figurine foot from graves with a burial in room 329 (45).

Watson, Richard P. (Texas Austin) THE RECONSTRUCTION OF PREHISTORIC AGRICULTURAL POTENTIAL FROM ENVIRONMENTAL PAPAMETERS: THE CHIMU CASE. The use of modern techniques of crop yield prediction are discussed with regard to their potential for reconstructing prehistoric productive capacities for irrigation agriculture. The use of such techniques appears to offer an approach that could provide readily comparable data from different regions and environments. The application of a technique based on evapotranspiration will be dis-

(8) Cited as it is being applied to late Chimú agriculture in two valleys on the north coast of Peru. (17)

Way, Karen L. (Bureau of Land Management) GUIDELINES FOR THE DESIGN OF SMALL PROJECT REPORTS. People from industry, government, and the academic world form the major components of the contract archaeology audience. The assumptions a report writer can make about such an audience are discussed and the special needs of each audience group are identified. Some general guidelines for the design of reports meant to satisfy all of these groups are presented, and suggestions for their special application to small survey reports are offered. (39)

Weaver, Donald E., Jr. (Museum of Northern Arizona) THE NORTHERN FRONTIER, HOHOKAM REGIONAL DIVERSITY AS SEEN FROM THE LOWER SALT RIVER VALLEY. Recent surveys and research at the Hassayampa, Agua Fria, New River, and Cave Creek drainages have documented considerable regional variation in the "normal" Hohokam pattern. The variation appears to be primarily related to environmental diversity, frontier stress, and external influences on neighboring cultures. The northern frontier Hohokam pattern includes extensive drying systems as well as irrigation systems based on permanent and intermittent surface water supplies; semi-subterranean and surface structures constructed of rock, perishable material, and adobe; and both clustered and dispersed settlement patterns. New knowledge of regional diversity in the northern frontier provides insights into many subsequent developments in the Hohokam heartland. (8)

Weder, Dennis (Archaeological-Environmental Research Corporation) THE FUNCTIONAL INTERPRETATION OF LITHIC SCATTERS DURING SURFACE RECONNAISSANCE. Since lithic scatters are the most prevalent site type found during surface reconnaissance operations, the interpretation of lithic scatters is an important source of information. Techniques for analyzing and interpreting bifaces, fragmentary projectile points, and the manufacturing stages that lead to finished tools will be discussed from the standpoint of the archaeological survey. With the capability to interpret the activities conducted at a lithic scatter, the data base for the analysis of subsistence cycles becomes larger. (19)

Weisbrod, Richard L. (UCLA) AN EXAMINATION OF PATTERN CLASSIFICATION TECHNIQUES IN ARCHAEOLOGICAL TYPOLOGY. The two basic approaches to archaeological typology call for two different kinds of mathematical tools. The first approach assumes types are inherent in the data and the task is to discover them. Mathematical tools appropriate in this context, search for patterns in the data, such as cluster analysis, form a taxonomy, factor analysis, etc., and are considered architectural classification. The second approach assumes types are created by the archaeologist to order the data. The tools appropriate in this context, pattern classification techniques, have received scant archaeological attention. This paper presents the results of experiments with pattern classification techniques and assesses their archaeological potential. A methodology that incorporates both sides of the typological coin is also examined. (15)

Westfall, Deborah (see Davidson, H. M.) (12)

Whalen, Michael E. (Texas-EI Paso) SOCIAL-ORGANIZATIONAL IMPLICATIONS OF HOUSEHOLD DISTRIBUTION IN A LATE MOLLON PITHouse VILLAGE. Communities are seen as frameworks of spaces and boundaries reflecting the sets of internal categories upon which social organization is founded. The distribution of household units in a late Mollon pithouse village is analyzed within this perspective. The result is identification of a trend toward increasing size and formalization of definition of society's component residential units from early to late pithouse times. It is suggested that this arrangement is a logical precursor to the succeeding pueblo organization. (45)

Whitley, David (UCLA) DISTANCE, DIRECTION AND SPATIAL ORGANIZATION IN NORTHERN BELIZE. This paper outlines the methodology and results of an initial study of the prehistoric settlement pattern in northern Belize. A demographic proxy variable is used to rank all sites hierarchically. Sites are then grouped within hierarchical clusters, and utilized to provide a two-dimensional description of these clusters. The spatial characteristics of paired hierarchical distributions are compared in an attempt to infer the spatial organizational patterns between sites of varying sizes. Initial results show these methods to be very useful, but suggest that regularities in spatial patterning are more highly developed in certain hierarchical levels than in others. (27)

Whittaker, John (see Kosakowsky, L.) (25)
Wilke, Philip J. (California-Riverside) THE "ANCIENT STONE FISH TRAPS" OF THE SALTON BASIN, CALIFORNIA. For nearly 70 years anthropologists have speculated on the significance of certain rock constructions in the Salton Basin, southeastern California. These structures have variously been interpreted as fish traps, house remains, pueblo ruins, and hunting blinds. They number in the thousands and are widely distributed in the basin. Field studies have shown that they were built in annual construction episodes during the last recession of Lake Cahuilla, about 1500 A.D., and are probably a specialized type of fishing weir similar to those used on the Lower Colorado River in historic times. (5)

Williams-Dean, Glennia (Texas A & M) DAILY LIFE OF PREHISTORIC MAN IN THE LOWER PECON REGION OF TEXAS. Analysis of a large sample of prehistoric human coprolites from a single depositional layer at Hinds Cave has been largely completed. The palynological, palaeontological, and isotopic data combine to outline the requirements of human adaptation to the semi-arid environment in southwestern Texas 6000 years ago. Suggestions as to seasonality and periodicity of human habitation in the rock shelter at this time level, as well as to methodological considerations, will be discussed. (28)

Wing, Elizabeth S. (Florida State Museum) MAYA FOODWAYS. The Maya area has been called the land of deer and turkey. Through the identification and analysis of animal remains excavated from Maya sites we may examine how well this typifies Maya subsistence. The work of Pollack and Ray and Pohl indicate that deer and turkey were indeed prime resources of inland Maya sites. Study of faunal remains from Maya sites located along the coastal and lower reaches of the Wiver show evidence of use of aquatic resources as well as terrestrial ones. This paper will examine some of the evidence that is now coming to light on Maya fishing. (3)

Winter, Marcus (INAH) ARCHAEOLOGY OF THE OTOMANGAUE AREA. Linguistic prehistory suggests the Tehuacan Valley as the cradle of the Otomanguean language family, with subsequent diversification and expansion throughout Mesoamerica. Archaeological data suggest the emergence of regionally distinct social formations, characterized by different linguistic and ethnic groups. Recent archaeological investigations in Oaxaca—the area of the greatest diversity of Otomanguean languages—suggest a probable correlation between the sequence of diversification of linguistic and major changes such as the widespread appearance of sedentary villages and social stratification. Regional patterns at different periods are described, with possible explanations for the emergence of linguistic and socio-political diversity in the area. (49)

Wiseman, Frederick M. (LSU) THE TERMINAL CLASSIC MAIZE EPISODE. A distinct minor peak of Zea pollen occurs immediately below the stratigraphic change from the "disturbed" to "climax" pollen floras in several cores from the Maya Lowlands. Technical, epistemological, and statistical methods yield data that indicate that the Maize Episode is not a function of statistical or sampling error. Implications of the potential ecological significance and stratigraphic position of the episode are that within the watersheds of at least three basins, maize monoculture may have replaced a previous diversified agriculture during the Terminal Classic Period. Such an implication may either reflect the internal turmoil accompanying, or be a minor cause of, the Maya Collapse. (10)

Wolfman, Daniel (Arkansas Archeological Survey) RECENT ARCHAEOLOGICAL RESULTS FROM ARKANSAS. Recent archaeo-magnetic results suggest that the tree-ring calibrated polar curve for the time period 1200-1500 A.D. developed in the southwest can also be used to date samples collected in Arkansas and border areas of adjacent states. A brief discussion of this dating method and the results obtained will be presented. (6)

Wolynec, Renata B. (Edinboro State College) ARCHAEOLOGICAL FEATURES AND INFORMATION. The relationship between features in cultural context and features in archaeological context is conceptualized by applying concepts from Information Theory. This conceptual framework examines the nature of information about human behaviors encoded in cultural context and how this information is encoded in patterns of organization manifested in an archaeological feature population. The applications of this conceptual framework to the analysis of Middle Archaic archaeological features excavated from the Koster Site are examined with emphasis upon generating inferential models as a means by which human behaviors can be inferred from spatially related patterns of feature organization. (6)

Wood, J. Scott (USDA Forest Service) THE SALT RIVER RECREATION PLAN: CULTURAL RESOURCE AND LAND USE MANAGEMENT IN THE TONTO NATIONAL FOREST, ARIZONA. This paper discusses the archaeological aspects of a long term land management program for the Salt River Recreation Area on the Tonto National Forest, Arizona. Archaeological input into the pre-planning or evaluative stage of management programs is emphasized. This process involves the inventory and assessment of cultural properties, evaluation of impacts, and formulation of management plans compatible with multiple and dominant uses. Objectives are seen as providing protection for both cultural and natural resources. Pre-planning evaluative input is seen as the most effective method for long range management and protection of cultural resources. (24)

Wood, J. Scott (see McAllister, Martin E.) (8)

Woods, William I. (SUI-Edwardsville) FIELD TUNNEL EROSION—A MESOAMERICAN EXAMPLE. Evidence of dramatic site alteration by a distinctive subsurface erosional process was observed during the 1975 Pueblo Preclassic Project. Tented field tunnel erosion, or piping, this phenomenon has been previously reported for a variety of non-site age and semi-arid locales. In site contexts, the process can result in both the selective removal of subsurface cultural horizons and in situ artifact modification. The archaeological significance of field tunnel erosion is discussed utilizing an example from the Puebla Valley. (40)

Word, James H. (Texas Archeological Society) THE CONSERVING AMATEUR EVALUATES PROFESSIONAL ARCHAEOLOGY. The amateur or avocational archaeologist must assume an attitude of responsibility by working with professional archaeologists and the general public to ensure the protection of information contained in archaeological sites. Many times this necessary situation requires the amateur to go an additional mile to help the professional archaeologist get the interested citizenry about the sites, hows, and the results of investigations. Suggestions are offered about how the vocational archaeologist can better integrate with the people who support archaeology. (18)

Wyckoff, Lydia L. (Yale) SOUTHWESTERN NICARAGUA: A STUDY OF CHANGE. An analysis of faunal and molluscan remains found in association with Middle and Late Polychrome Period artifacts will be presented as it provides information as to the subsistence practices during these periods. Furthermore, it will be noted that the faunal and molluscan remains are in agreement proportions during these two periods with the greatest quantity of faunal remains associated with the Late Polychrome Period. It is hypothesized that this pattern is the result of environmental and cultural change. (32)

Yoshida, D. (Maine) CARIBOU EXPLOITATION IN INTERIOR ALASKA: PALEOECOLOGY OF THE PAXSON LAKE SITE. Study of caribou exploitation sites is relevant to understanding: (1) traditional subsistence hunting patterns, (2) response of hunter-gatherers to changing game migration patterns, (3) efficient use of the tundra-forest ecotone, and (4) Upper Paleolithic megafaunal exploitation, particularly with reference to caribou. To this end, detailed faunal analysis is undertaken from the Paxson Lake site in interior Alaska. Dental eruption sequences indicate fall-winter site usage conforming to present availability of the Neltina herd. Dental wear patterns indicate unexpected concentration of older caribou. These data suggest primary site usage for clothing fabrication, confirmed by an in situ bone awl production sequence. (47)

Young, D. (see Clark, G. A.) (34)