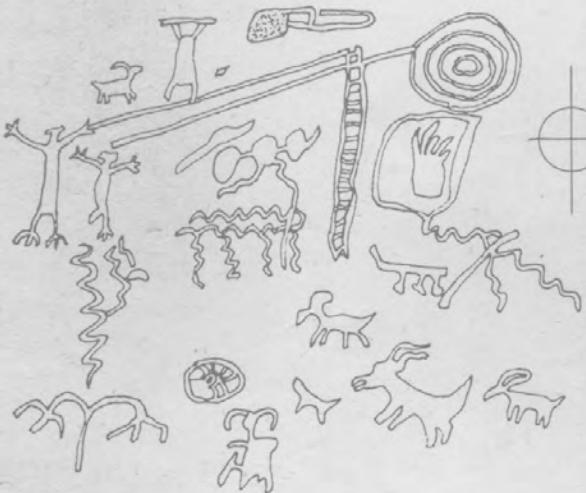


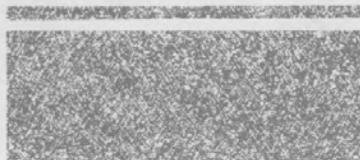
MARQUARDT

55<sup>th</sup>  
ANNUAL MEETING

SOCIETY FOR AMERICAN ARCHAEOLOGY



PROGRAM  
AND  
ABSTRACTS



RIVIERA HOTEL  
LAS VEGAS, NEVADA  
APRIL 18-22, 1990

# Latin American Antiquity

Have you  
and/or  
your institution  
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**PROGRAM AND ABSTRACTS  
of the Fifty-Fifth Annual Meeting  
Las Vegas, Nevada  
April 18-22, 1990**

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**MEETING ROOMS**

All functions are in the Convention Center  
Rooms A thru J and Rooms 1-8 are on the ground floor.  
Rooms 16 thru 22 are on the second floor.  
Rooms K and L are on the 24th floor.

**NEW ORLEANS in 1990**

Plan to attend the Society's fifty-sixth annual meeting to be held at the  
Clarion Hotel, New Orleans, Louisiana, April 24-28, 1991.

The annual meeting of the Society for American Archaeology provides a forum for the dissemination of knowledge and discussion. The views expressed at the sessions are solely those of the speakers and the Society does not endorse, approve, or censor them. Descriptions of events and titles are those of the organizers, not the Society.

**Cover:** Line drawings representative of Southern Nevada Rock Art by LaRae Bringhurst. Used courtesy of the Marjorie Barrick Museum of Natural History, University of Nevada, Las Vegas. View the exhibit "Rock Art in Southern Nevada" at the Museum through Saturday, April 21.

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MORTAR AND PESTLE PRESS

**SOCIETY FOR  
AMERICAN ARCHAEOLOGY  
Fifty-Fifth Annual Meeting**

**1990 SAA PROGRAM COMMITTEE**

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*Queens College*

Vickie Mentasti  
*Assistant to the Chair*

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*University of California-Berkeley*

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**Executive Committee Members**  
Margaret Conkey  
Brian Fagan  
Mark J Lynott  
Robert L Bettinger

## GENERAL INFORMATION

**Abstracts** Abstracts of papers presented at this meeting are included in the Program. Additional copies are available for \$5 per copy and may be ordered prepaid from the Society, 808 17th St NW, Suite 200, Washington DC 20006.

**Business Meeting** The Society's annual business meeting will begin at 5:30 PM on Friday in Room F.

**Convention Office** Any problems or special requests during the meeting should be reported to the Convention Office in Offices 1 & 2 which are in back of the registration area, Convention Center Foyer.

**Exhibits** Exhibits will be displayed in Room E from 9 AM to 6 PM on Thursday and Friday, and 9 AM to 2 PM on Saturday.

**Membership Services and Publications** SAA publications will be displayed and membership information will be available in the exhibit room during the exhibit hours.

**Message and Information Center** A self-service message center will be open in the Convention Center Foyer from 5 PM to 8 PM Wednesday, and from 8 AM to 5 PM Thursday through Saturday.

**Student and New Member Reception** Officers of the Society will host a reception for students, new members and members attending their first annual meeting on Wednesday at 8 PM in Skyroom L.

**Placement Service** A placement service will be conducted in Room 21 from 5 PM to 8 PM on Wednesday, 8 AM to 5 PM on Thursday and Friday, and from 8 AM to noon on 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 from 5 PM to 8 PM on Wednesday, from 7:30 AM to 3 PM on Thursday, 8 AM to 3 PM on Friday, and 8 AM to noon on Saturday. Individuals who preregistered by March 26 should claim their badges and programs at the advance registration desk. Wearing of the badge is required for admission to all session and the exhibits.

**Symposia and Sessions 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.

**Session Smoking Ban** Smoking during sessions will not be permitted.

**Slide Screening Room** A 35mm slide projector and screen will be available in Room 16 from Wednesday at 6 PM and thereafter throughout the meeting for presenters who wish to check their slides before presentation.

## ANNUAL MEETINGS OF THE SOCIETY FOR AMERICAN ARCHAEOLOGY

| Meeting | Place                       | Date  |
|---------|-----------------------------|---|
| 1st     | Andover, Massachusetts      | December, 1935  |
| 2nd     | Washington, DC              | December, 1936  |
| 3rd     | Milwaukee, Wisconsin        | May, 1938   |
| 4th     | Ann Arbor, Michigan         | May, 1939   |
| 5th     | Indianapolis, Indiana       | April, 1940   |
| 6th     | Minneapolis, Minnesota      | May, 1941   |
| 7th     | Cincinnati, Ohio            | May, 1942   |
| 8th     |                             | Because of travel difficulties and other wartime restrictions, the business of the annual meeting in 1943 was conducted by mail by the Executive Committee, whose actions were approved at the next annual meeting. |
| 9th     | Washington, DC              | May, 1944   |
| 10th    | Washington, DC              | May, 1945   |
| 11th    | Indianapolis, Indiana       | May, 1946   |
| 12th    | Ann Arbor, Michigan         | May, 1947   |
| 13th    | Milwaukee, Wisconsin        | May, 1948   |
| 14th    | Bloomington, Indiana        | May, 1949   |
| 15th    | Norman, Oklahoma            | May, 1950   |
| 16th    | Evanston, Illinois          | May, 1951   |
| 17th    | Columbus, Ohio              | May, 1952   |
| 18th    | Urbana, Illinois            | May, 1953   |
| 19th    | Albany, New York            | May, 1954   |
| 20th    | Bloomington, Indiana        | May, 1955   |
| 21st    | Lincoln, Nebraska           | May, 1956   |
| 22nd    | Madison, Wisconsin          | May, 1957   |
| 23rd    | Norman, Oklahoma            | May, 1958   |
| 24th    | Salt Lake City, Utah        | May, 1959   |
| 25th    | New Haven, Connecticut      | May, 1960   |
| 26th    | Columbus, Ohio              | May, 1961   |
| 27th    | Tucson, Arizona             | May, 1962   |
| 28th    | Boulder, Colorado           | May, 1963   |
| 29th    | Chapel Hill, North Carolina | May, 1964   |
| 30th    | Urbana, Illinois            | May, 1965   |
| 31st    | Reno, Nevada                | May, 1966   |
| 32nd    | Ann Arbor, Michigan         | May, 1967   |

|      |                            |                 |
|------|----------------------------|-----------------|
| 33rd | Santa Fe, New Mexico       | May, 1968       |
| 34th | Milwaukee, Wisconsin       | May, 1969       |
| 35th | Mexico City, Mexico        | May, 1970       |
| 36th | Norman, Oklahoma           | May, 1971       |
| 37th | Bal Harbour, Florida       | May, 1972       |
| 38th | San Francisco, California  | May, 1973       |
| 39th | Washington, DC             | May, 1974       |
| 40th | Dallas, Texas              | May, 1975       |
| 41st | St. Louis, Missouri        | May, 1976       |
| 42nd | New Orleans, Louisiana     | April, 1977     |
| 43rd | Tucson, Arizona            | May, 1978       |
| 44th | Vancouver, Canada          | April, 1979     |
| 45th | Philadelphia, Pennsylvania | May, 1980       |
| 46th | San Diego, California      | April–May, 1981 |
| 47th | Minneapolis, Minnesota     | April, 1982     |
| 48th | Pittsburgh, Pennsylvania   | April, 1983     |
| 49th | Portland, Oregon           | April, 1984     |
| 50th | Denver, Colorado           | May, 1985       |
| 51st | New Orleans, Louisiana     | April, 1986     |
| 52nd | Toronto, Ont.              | May 1987        |
| 53rd | Phoenix, Arizona           | April 1988      |
| 54th | Atlanta, Georgia           | April 1989      |

## SOCIETY FOR AMERICAN ARCHAEOLOGY

### Past Presidents

(\*Deceased)

|                        |         |                        |         |
|------------------------|---------|------------------------|---------|
| A C Parker *           | 1935–36 | Jesse D Jennings       | 1959–60 |
| Diamond Jenness *      | 1936–37 | Erik K Reed            | 1960–61 |
| A V Kidder *           | 1937–38 | Junius Bird *          | 1961–62 |
| Edgar B Howard *       | 1938–39 | David A Baerreis *     | 1962–63 |
| Neil Judd *            | 1939–40 | James A Ford *         | 1963–64 |
| W C McKern *           | 1940–41 | Albert C Spaulding     | 1964–65 |
| Glenn Black *          | 1941–42 | Paul S Martin *        | 1965–66 |
| Nels C Nelson *        | 1942–43 | Joe B Wheat            | 1966–67 |
| Emil W Haury           | 1943–44 | Gordon B Willey        | 1967–68 |
| J Alden Mason *        | 1944–45 | H Marie Wormington     | 1968–69 |
| Carl E Guthe *         | 1945–46 | Ignacio Bernal         | 1969–70 |
| Frederick Johnson      | 1946–47 | Robert Lister          | 1970–71 |
| Douglas S Byers *      | 1947–48 | Richard S MacNeish     | 1971–72 |
| Waldo R Wedel          | 1948–49 | Charles C DiPeso *     | 1972–73 |
| J O Brew *             | 1949–50 | Douglas W Schwartz     | 1973–74 |
| Frank H H Roberts Jr * | 1950–51 | Charles R McGimsey III | 1974–75 |
| James B Griffin        | 1951–52 | Stuart Struever        | 1975–76 |
| Irving Rouse           | 1952–53 | Raymond H Thompson     | 1976–77 |
| Gordon Ekholm *        | 1953–54 | Cynthia Irwin-Williams | 1977–79 |
| Robert Wauchope *      | 1954–55 | Fred Wendorf           | 1979–80 |
| W Duncan Strong *      | 1955–56 | Richard E W Adams      | 1981–83 |
| William A. Ritchie     | 1956–57 | George C Frison        | 1983–85 |
| George I Quimby Jr     | 1957–58 | Don D Fowler           | 1985–87 |
| Richard B Woodbury     | 1958–59 | Dena F Dincauze        | 1987–89 |

**AWARDS TO ARCHAEOLOGISTS**  
**Compiled by N Woodbury**

The *Viking Fund Annual Awards in Anthropology* (provided by the WennerGren Foundation) consisted of three Viking Fund Medals, with accompanying Viking Fund Prizes of \$1,000 each. These were awarded annually 1946–60 for distinguished research, publication and contribution to science. Scholars were selected by committees of their respective societies—in archaeology by the Society for American Archaeology, in general anthropology by the American Anthropological Association and in physical anthropology by the American Association of Physical Anthropologists.

The awardees in archaeology are:

|                                      |                                |
|--------------------------------------|--------------------------------|
| 1946 Alfred Vincent Kidder           | 1954 William Duncan Strong     |
| 1947 John Otis Brew                  | 1955 John Eric Sidney Thompson |
| 1948 Alex Dony Krieger               | 1956 Junius Bouton Bird        |
| 1949 Hallam Leonard Movius, Jr.      | 1957 James Bennett Griffin     |
| 1950 Emil Walter Haury               | 1958 Jesse David Jennings      |
| 1951 Frank Harold Hanna Roberts, Jr. | 1959 Irving Rouse              |
| 1952 Alfonso Caso                    | 1960 Samuel Kirkland Lothrop   |
| 1953 Gordon Randolph Willey          |                                |

The *Alfred Vincent Kidder Award*, a bronze medallion bearing the likeness of Kidder, was established in 1950 as a tribute to the leadership of A V Kidder by the American Anthropological Association. It has been awarded every three years for eminence in American archaeology, particularly in those fields in which Kidder contributed so much, the Southwestern United States and Middle America.

The awardees have been:

|                                |                                |
|--------------------------------|--------------------------------|
| 1960 Alfred Marston Tozzer     | 1971 Richard Stockton MacNeish |
| 1953 Earl Halstead Morris      | 1974 Gordon Randolph Willey    |
| 1956 Samuel Kirkland Lothrop   | 1977 Emil Walter Haury         |
| 1959 Charles Corradino Di Peso | 1980 William Timothy Sanders   |
| 1962 Tatiana Proskouriakoff    | 1983 Samuel Watson Smith       |
| 1965 Neil Merton Judd          | 1986 Ignacio Bernal            |
| 1968 Paul Sidney Martin        | 1989 Richard B Woodbury        |

The *Distinguished Service Award* of the Society for American Archaeology was established in 1975. In 1980 it was decided to make the award annually. It consists of a framed inscribed citation.

The awardees have been:

|                             |                               |
|-----------------------------|-------------------------------|
| 1975 Carl Haley Chapman     | 1981 Albert Clanton Spaulding |
| Charles Robert McGimsey III | 1982 Jesse David Jennings     |
| 1980 Gordon Randolph Willey | 1983 Hannah Marie Wormington  |

|                            |
|----------------------------|
| 1984 James Bennett Griffin |
| 1985 Emil Walter Haury     |
| 1986 Waldo R Wedel         |
| 1987 William A Ritchie     |

|                           |
|---------------------------|
| 1988 Richard B Woodbury   |
| and Nathalie F S Woodbury |
| 1989 George Irving Quimby |

The *Fryxell Award for Interdisciplinary Research* was set up by the Society for American Archaeology in 1977 in memory of Roald Fryxell whose career exemplified so well the crucial role of interdisciplinary cooperation in archaeology. The award, consisting of a citation and a medallion, was to be presented annually; however, no award was made in 1984.

The awardees have been:

|                                    |                       |
|------------------------------------|-----------------------|
| 1978 C Vance Haynes                | 1984 (No Award)       |
| 1979 Peter J Mehringer             | 1985 Roger T Saucier  |
| 1980 James B Griffin               | 1986 Donald K Grayson |
| 1981 Karl W Butzer                 | 1987 Richard I Ford   |
| 1982 David A Baerreis              | 1988 David M. Hopkins |
| 1983 John E Guilday (posthumously) | 1989 Joseph B Lambert |

The *Crabtree Award* was established by the Society for American Archaeology in 1985 to recognize major contributions to American archaeology by individuals who have had little if any formal training in archaeology and little if any wage or salary as an archaeologist. The award is named after Don Crabtree of Twin Falls, Idaho, who made significant contributions to the study of lithic technology and whose dedication to archaeology was a lifelong personal and financial commitment.

The awards have been:

|                           |                          |
|---------------------------|--------------------------|
| 1985 Clarence H. Webb, MD | 1988 Julian Dodge Hayden |
| 1987 Leonard W Blake      | 1989 J B Sollberger      |

## BUSINESS & SOCIAL EVENTS

### MONDAY, APRIL 16

- 8:00 AM U.S. Forest Service—Room 3  
8:00 AM UN-Reno BLM Workshop in CRM—Room 4  
9:00 AM National Science Foundation—Room 19  
12 Noon BLM Cultural Resources Program Leaders Meeting—Room 20

### TUESDAY, APRIL 17

- 8:00 AM U.S. Forest Service—Room L  
8:00 AM Soil Conservation Service—Room 17  
8:00 AM Army Corps of Engineers—Room H  
8:00 AM UN-Reno BLM Workshop in CRM—Room G  
8:00 AM BLM Cultural Resources Program Leaders Meeting—Room 20  
8:00 AM UN-Reno Seminar—Nuts & Bolts: Memoranda of Agreement (MOA's), Programmatic Agreements (PA's) and No Adverse Effect Determinations—Room 5  
9:00 AM National Science Foundation—Room 19

### WEDNESDAY, APRIL 18

- 8:00 AM SAA Executive Board—Room 3  
8:00 AM SAA Government Affairs Committee—Room 18  
8:00 AM U.S. Forest Service—Room 1  
8:00 AM U.S. Forest Service—Room 4  
8:00 AM U.S. Forest Service—Room 5  
8:00 AM U.S. Forest Service—Room 19  
8:00 AM BLM Cultural Resources Program Leaders Meeting—Room 20  
8:00 AM Soil Conservation Service—Room 17  
8:00 AM Roundtable for Department of Energy Affiliated Archaeologists—Room 22  
8:00 AM Association of Transportation Archeologists—Room 2  
8:00 AM Army Corps of Engineers—Room I  
8:00 AM UN-Reno BLM Workshop in CRM—Room C  
8:00 AM UN-Reno Seminar—Nuts & Bolts, continued—Room F West  
9:00 AM National Association of State Archaeologists—Room J  
10:00 AM National Park Service—Room 21  
12 Noon Roundtable on New Trends in Archeometallurgy—Room F East  
1:00 PM U.S. Forest Service—Rooms 4 & 5  
2:00 PM Volunteer Workers Meeting—Room 1  
3:00 PM Society for Archaeological Sciences—Room 22  
4:30 PM Archeology in the Classroom—A one credit course through the University of Nevada introducing *Project Archeology: Saving Traditions (P.A.S.T.)* to teachers of the Las Vegas area and SAA archaeologists. Through participatory activities the teachers will learn about archeology as a science, involving not only the collection of data but also how analyses take place. Emphasis will be placed on how students can be actively involved in conservation archeology in their own town. SAA archeologists are welcome to come in at any time.—Room 1

- 8:00 PM Student and New Member Reception—Room L

### THURSDAY, APRIL 19

- 8:00 AM Society of Professional Archeologists Board Meeting—Room 1  
8:00 AM SAA History of Archaeology Committee—Room 20  
9:00 AM Open Forum—SAA leaders will be available to discuss Society activities in relation to reburial and repatriation issues with any interested members—Room 5  
9:00 AM SAA Committee on Public Archaeology—Room 4  
11:30 AM Council of Presidents Luncheon (By invitation only)—Ristorante  
12 Noon Foundation for Field Research: Writing a Grant Proposal—  
Room 5  
12 Noon Society of Professional Archeologists Business Meeting—  
Room 1  
12 Noon Society for Archaeological Sciences Executive Board Meeting—  
Room 18  
2:00 PM Meet the New Editors. Interested persons are invited to meet with J. Jefferson Reid, Editor of *American Antiquity* and Prudence M. Rice, Editor of *Latin American Antiquity*—  
Room 20  
2:00 PM American Society for Conservation Archaeology Executive Committee Meeting—Room 19  
2:00 PM Society of Professional Archeologists Board Meeting—Room 1  
4:30 PM Archeology in the Classroom, continued—Room 5  
5:00 PM Society for Archaeological Sciences Business Meeting—Room 4  
7:00 PM Reception—Cash Bar—Room A  
7:00 PM Protecting the Past Authors' Reception (By invitation only)—  
Room 1  
8:00 PM Plenary Session—Rooms F, G & H

### FRIDAY, APRIL 20

- 8:00 AM Archeology Section of American Anthropological Association Executive Committee Meeting—Room 17  
9:00 AM SAA Finance Committee—Room 18  
1:00 PM American Society for Conservation Archaeology: Business Meeting followed by Executive Committee Meeting—Room 1  
1:00 PM Foundation for American Archaeology—Task Force—Room 18  
2:00 PM Task Force on Council of Affiliated Societies—Room 20  
2:00 PM Save the Past for the Future Steering Committee—Room 4  
4:30 PM Archeology in the Classroom, continued—Room 5  
5:30 PM SAA Annual Business Meeting—Room F  
7:30 PM Roundtable Discussion on Public Education—Room 1  
8:00 PM Women in Archaeology—Cash Bar Reception—Skyroom L

### SATURDAY, APRIL 21

- 8:00 AM SAA Executive Board—Room 5  
8:00 AM American Society for Conservation Archaeology Workshop—  
Room 4  
10:00 AM SOPA Application Workshop—Room 18

## SPECIAL EVENTS

Participation in special events is by pre-registration only. However, since space may be available on some tours, interested persons should inquire at the Convention Office. All tours will leave from and return to the convention center entrance of the Riviera Hotel.

### TUESDAY, APRIL 17: Special Event #1

**Nevada Test Site** 6:00 AM–5:00 PM. This day-long bus tour of the Nevada Test Site will focus on prehistoric hunter and gatherer adaptations to this dry, arid environment of southern Nevada and the evidence for past changes in this environment. The tour will be led by Dr. Lonnie C. Pippin, Desert Research Institute, and will be limited to 44 participants. Archaeological sites visited will include Western Pluvial Lakes Tradition and Late Archaic sites at an arid mountain range in the Mojave Desert and Middle and Late Archaic sites on a pinyon-juniper covered mesa in the Great Basin Desert. No on-site registration available.

### WEDNESDAY, APRIL 18: Special Event #2A

**Red Rock Tour** 1:00 PM–5:00 PM. Tour the scenic Red Rock State Park and travel with BLM archaeologists to view the cultural resources of the Brownstone Canyon Archaeological District. Camp sites, roasting pits and an extensive pictograph panel are featured, as are short stops at Willow Springs and Lost Creek Spring. A charge of \$13.00 covers transportation. This tour will be repeated on Saturday, April 21.

### WEDNESDAY, APRIL 18: Special Event #3A

**Las Vegas Story** 1:00 PM–5:00 PM. This tour gives an overview of the cultural history of the Las Vegas valley in one afternoon. Stops at the Old Mormon Fort, site of the first permanent Anglo settlement, and Big Springs, source of water for the Vegas and a favorite camping site for desert travelers through the centuries, give a feeling for the past. The Nevada State Museum and Historical Society features exhibits on the history and environment of southern Nevada, and the Clark County Heritage Museum presents the development of Clark County in this century. A charge of \$13.00 covers deluxe bus transportation and admission to the museums. This tour will be repeated on Friday and Saturday, April 20 and 21.

### THURSDAY, APRIL 19: Special Event #4

**Valley of Fire Tour** 8:00 AM–3:00 PM. Dr. Kevin Rafferty of Clark County Community College and Robert Leavitt, Nevada Department of Transportation, will lead a trip to view camp sites and rock art sites in Valley of Fire State Park, and Pueblo sites of the Virgin Branch Anasazi at and near the Lost City Museum in Overton, Nevada. The trip will return directly to Las Vegas from the museum. A charge of \$20.00 includes deluxe bus transportation and lunch.

### FRIDAY, APRIL 20: Special Event #5

**Lake Mojave Tour** 8:00 AM–5:00 PM. Join Dr. Claude Warren of the UNLV Department of Anthropology for this trip to view the northern portion of

Pleistocene Lake Mojave, where Elizabeth Campbell and Malcolm Rogers recorded sites associated with beach lines of high lake stands. The tour will also visit sites where later investigators have recorded materials used to date the lake stands. Investigations of these sites by Campbell, Rogers, and Warren and Ore will be discussed in the field. A charge of \$20.00 includes deluxe bus transportation and lunch.

### FRIDAY, APRIL 20: Special Event #6

**Exhibit Opening**—6:00 PM–9:00 PM. SAA delegates are invited to join the members of the Nevada State Museum and Historical Society for a special preview of the exhibit *Archaeology of Southern Nevada*, which will include an overview of regional archaeology and the work done by archaeologists in the area. There is no charge for this event, but the Museum would like to know if you are coming. Maps will be provided at the meeting.

*The following tours are repeats of Special Events #2A and #3A which have been described above.*

### FRIDAY, APRIL 20: Special Event #3B

**Las Vegas Story** 1:00 PM–5:00 PM

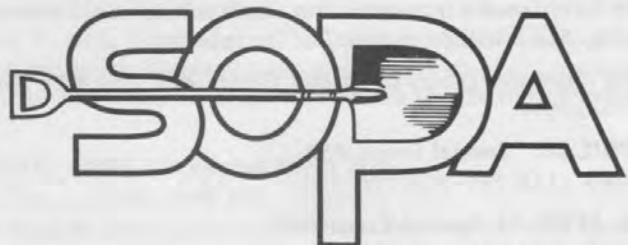
### SATURDAY, APRIL 21: Special Event #2B

**Red Rock Tour** 9:00 AM–1:00 PM

### SATURDAY, APRIL 22: Special Event #3C

**Las Vegas Story** 1:00 PM–5:00 PM

## The Society of Professional Archeologists



The Society of Professional Archeologists was formed in 1976 from a committee of the Society for American Archaeology. Since its inception, SOPA has grown in size, responsibility, and influence. SOPA is widely recognized for its continuing commitment to promote high standards of research and performance within the profession.

The Society of Professional Archeologists invites and encourages all archeologists to join ranks with the growing number of SOPA applicants and members. For information on how to join, please visit the SOPA information table at this conference, or contact:

David L. Carlson  
Anthropology Department  
Texas A & M University  
College Station, Texas 77843  
telephone - (409) 845-4404

## PROGRAM

### THURSDAY MORNING APRIL 19, 1990

#### [01] Symposium: COLUMBIAN CONSEQUENCES, PART I: THE NATIVE CONTEXT OF EARLY COLONIALISM IN SOUTHERN MESOAMERICA AND CENTRAL AMERICA

##### Room B

Organizers: David Hurst Thomas and David M. Pendergast  
Organizer and Chairperson: Grant D. Jones

##### Participants

- 8:00 William R. Fowler, Jr.; The Political Economy of Spanish-Indian Relations in 16th Century Izalco, El Salvador  
8:20 William V. Davidson; Geographical Perspectives on Spanish-Pech (Paya) Indian Relationships, Northeast Honduras, 1502-1684  
8:40 Gloria Lara Pinto; Change for Survival: The Case of 16th Century Indigenous Populations of Northeast and Mideast Honduras  
9:00 John M. Weeks and Nancy Black; Mercedarian Missionaries and the Transformation of Lenca Indian Society, Western Honduras, 1550-1700  
9:20 Wendy Kramer; The Fall of Santiago de Guatemala at Iximche, 1524-1526  
9:40 W. George Lovell, Wendy Kramer and Christopher H. Lutz; Juan de Espinar and the Indians of Huehuetenango  
10:00 BREAK  
10:10 Robert Hill, II; The Social Uses of Writing Among the Colonial Cakchiquel Maya: Nativism, Resistance, and Innovation  
10:30 Janine Gasco; Strategies for Survival Among the Indians of Colonial Soconusco  
10:50 Elizabeth Graham and David M. Pendergast; Maya Responses to Spanish Colonialism in Belize: Cultural Strategies or Community Ingenuity?  
11:10 Anthony Andrews; The Early Mission Church in Yucatan: An Archaeological Perspective on the Colonial Process  
11:30 Murdo MacLeod; Indian Riots and Rebellions in Colonial Central America 1530-1720: Causes and Categories  
11:50 Robert M. Carmack; Cultural Traditions and Economic Factors in the Conquests of Guatemala and Costa Rica

#### [02] General Session: STUDIES IN MESOAMERICAN PREHISTORY

##### Room C

##### Participants

- 8:00 John Pohl and Bruce E. Byland; Bureaucracy in Postclassic Mixtec Kingdoms: Ethnohistoric and Archaeological Evidence from Tilantongo  
8:20 Karl Taube and Tomas Gallareta; The San Angel Survey Project: A Reconnaissance in the Northern Quintana Roo Savanna System  
8:40 Barbara Voorhies and George H. Michaels; The Chantuto People Revisited: New Research on the Late Archaic Period of Coastal Chiapas, Mexico  
9:00 David J. Rue; The Middle Preclassic in the Caverns of Copan  
9:20 Payson D. Sheets and Brian R. McKee; Household Archaeology at Cerén, El Salvador  
9:40 L. Lynette Heller; Classic and Postclassic Obsidian Tool Production and Consumption Patterns: A Regional Perspective from La Mixtequilla, Veracruz  
10:00 BREAK  
10:10 Patricia Plunket, Gabriela Ururuela and Eduardo Merlo; Postclassic Stone Carving from the Valley of Atlixco, Puebla, Mexico  
10:30 Evelyn Rattray; Thin Orange Ceramic Production and Social Organization in Southern Puebla

- 10:50 David A. Phillips; A Re-Evaluation of the Robles Phase of the Casas Grandes Culture, Northwest Chihuahua  
 11:10 Elizabeth Oster Mozzillo; Las Ventanas: A Northern Mesoamerican Frontier Site in Zacatecas, Mexico  
 11:20 Michael Spence; Recent Excavations in the Oaxaca Barrio of Teotihuacan  
 11:30 Cathy Crane; Palynological Research at Cerros, Belize

**[03] Symposium: DOLLARS AND SENSE OF FEDERAL ARCHAEOLOGY PROGRAMS**

Room I  
 Organizer and Chairperson: Edward B. Jelks

**Participants**

- 8:00 Francis P. McManamon; Federal Archaeology: The Current Program  
 8:20 Evan I. DeBlois; The USDA Forest Service's Cultural Resource Management Program  
 8:40 Larry D. Banks; The Archaeology Program in the U.S. Army Corps of Engineers  
 9:00 Richard Brook and John E. Douglas; The Publics' Return on Their Archaeology Dollars  
 9:20 Patricia J. O'Brien; U.S. Government Archaeology on the Great Plains  
 9:40 Roberta S. Greenwood; A View from the Outside  
 10:00 Hester Davis; Taking and Giving: How Successful is the Federal Effort at Informing the Public about Archaeology?  
 10:20 Discussants: Bruce Rippeteau and Thomas F. King

**[04] General Session: ISSUES IN CRM**

Room I

**Participants**

- 11:00 Edward V. Curtin; The Return to Salvage Archaeology  
 11:20 Nancy Andrews; Contract Archaeology's Contribution to Archaeological Research: A Case Study from Arizona  
 11:40 Gary Nurkin; The Abandoned Shipwreck Act: Legalizing Conflicting Values or Protecting Cultural Resources

**[05] General Session: FORAGING TO FARMING IN THE SOUTHWEST**

Room J

**Participants**

- 8:00 M. Steven Shackley; Early Hunter-Gatherer Procurement Ranges and Mobility in the American Southwest  
 8:20 Patrick Hogan and Bradley J. Vierra; Archaic Mobility Strategies in Northwestern New Mexico: Implications for the Adoption of Agriculture  
 8:40 Peter W. Bungart; Late Archaic Expansion in the Upper Glen Canyon Region, Southeastern Utah  
 8:50 Francis E. Smiley and William J. Parry; Early, Intensive, and Rapid: Rethinking the Agricultural Transition in the Northern Southwest  
 9:10 Bruce B. Huckell and Lisa W. Huckell; The Adoption of Agriculture in the Arid Southwest: New Investigations at the Fairbank Site, San Pedro River Valley  
 9:30 Bob Lawrence; Evidence for the Introduction of Corn and the Bow and Arrow into Northeastern New Mexico  
 9:40 Jeffrey H. Altschul and Jeffrey A. Homburg; The Relationship between Agricultural Systems and Settlement Patterns in the Lukachukai Valley  
 10:00 Cynthia Bettison; Settlement Location, Environmental Conditions, and Agricultural Requirements: An Archaeological Interpretation in East-Central Arizona  
 10:20 Laurie V. Slawson; An Example of Environmental Adaptation: Hohokam Dry-Farming Agriculture in the Southern Salt-Gila Basin  
 10:40 Patricia A. Ruppe' and Carol B. Brandt; Subsistence in the Zuni River Valley: The Archaeobotanical Data  
 11:00 Thomas Rocek; Examining the Pithouse to Pueblo Transition: The Dunlap-Salazar Site, LA 51344, in South-Central New Mexico

- 11:10 Phil R. Geib and G. Lennis Berlin; Investigation of Basaltic Ash Ridge-and-Mound Agricultural Fields Discovered by Remote Sensing in North-Central Arizona  
 11:20 Bruce Bradley; Patterns of Growth at Prehistoric Pueblos  
 11:40 Karen Dohm and Lee-ann Hayek; Village Population Estimation from Historic Period Pueblo Data

**[06] General Session: SOCIAL COMPLEXITY IN THE OLD WORLD**

Room G

**Participants**

- 8:00 David Small; Contexts of Interaction and Structural Marxist Approaches in Archaeology  
 8:20 Andrew M.T. Moore and Theya I. Molleson; Death on the Euphrates  
 8:40 Kathryn Trinkaus; Sample Comparability and Assemblage Structure as Inferential Tools  
 9:00 Margaret Glass; Taxonomic Diversity and Economic Specialization in Neolithic Europe  
 9:20 Patricia Wattenmaker; Status and Subsistence in Pre-State and Early State Society  
 9:40 Nancy Wicker; The Politics of Adornment: Gender, Status, and the Consumption of Precious Metals in Migration Period Scandinavia  
 10:00 Ken Stark; Wealth Control and Sociopolitical Change in Prehistoric Japan  
 10:20 Christian E. Guksch; Towards an Ethno-Archaeological Interpretation of Old Kingdom Socio-Political Organization  
 10:40 Bernice Kurchin; Measuring the Effects of Colonialism: Rome in North Britain  
 11:00 Katina T. Lillios; Competition to Consolidation: The Copper to Bronze Age Transition in Central Portugal  
 11:20 P. Nick Kardulias; Offshore Islands and the Exploitation of Marginal Zones in Bronze Age and Late Antique Greece  
 11:40 Lenore Gallin and Robert Tykot; A Bronze Age Village in Sardinia: A Preliminary Report of the Excavations at Nuraghe Santa Barbara (Bauladu) 1986–1989  
 11:50 Douglass W. Bailey; The Social Reality of Figurines

**[07] Symposium: CURRENT RESEARCH IN WESTERN LAKES AND MARSHES**

Room 2 & 3

Organizers and Chairpersons: John M. Beaton and Leslie L. Hartzell

**Participants**

- 8:00 Judith A. Willig; Paleo-Archaic Lake-Marsh Adaptations at the Pleistocene-Holocene Boundary in the Northern Alkali Lake Basin, Oregon  
 8:15 Carla D. Burnside; Upland Modoc Village/Sites Associated with Wetlands  
 8:30 Charlotte Beck, George T. Jones and Richard E. Hughes; Lithic Raw Material Procurement and Its Relationship to Late Pleistocene-Early Holocene Population Mobility in the Central Great Basin  
 8:45 John M. Beaton; Subsistence and Fluctuating Lake Levels at Tule Lake and Far Northern California  
 9:00 Mark O. Sutton; Koehn Lake in the Prehistory of the Southwestern Great Basin  
 9:15 Eugene M. Hattori, William J. Cannon, D. Craig Young and Don D. Fowler; Lake Fluctuations and Subsistence Adaptations in Warner Valley, Oregon  
 9:30 Joel Janetski; The Role of Lake Edge Resources in Hunter-Gatherer Subsistence: Faunal Evidence from the Eastern Great Basin  
 9:45 Steven Simms; The Fremont/Late Prehistoric Transition as Seen from the Great Salt Lake Marshes  
 10:00 BREAK  
 10:10 Christopher Raven; The Cultural Life of Significant Soil: A Context for Wetlands Archaeology  
 10:25 G. James West, Owen K. Davis and William J. Wallace; Environment and Archaeology of Tulare Lake, California: A Preliminary Examination  
 10:35 Peter D. Schulz; Archaeological Perspectives on Native Central California Inland Fisheries  
 10:50 Kenneth Gobalet; Fish Remains as Habitat Indicators  
 11:05 Amy J. Dansie; Prehistoric Carnivore Usage Patterns in Great Basin Lacustrine Settings

- 11:20 Robert G. Elston; Ebb and Flow: Stability and Persistence of Marshes in the Carson Desert  
 11:35 Albert C. Oetting; Villages, Wetlands Adaptations, and Sedentism in the Great Basin  
 11:50 Discussant: Don D. Fowler

**[08] Symposium: THE ROCKY MARRIAGE BETWEEN ARCHAEOLOGICAL RESEARCH AND CRM**

Room F

Organizers and Chairpersons: Miranda Warburton and Anthony L. Klesert

Participants

- 8:00 Kathleen Gratz; New Lands Puerco Valley Archaeological Project: This Federal Contract Archaeology Program Encourages Research  
 8:15 Eric van Hartesveldt and Kurt Dongske; Prehistoric Settlement Patterns Along the Rio Puerco of the West: The Meshing of CRM Survey Results with Regional Research Questions  
 8:30 Lawrence C. Todd, Michael Lawson and Kelly Klein; Linear and Small-Scale Survey as a Regional Pattern Recognition Strategy  
 8:45 Richard M. Begay, Klara B. Kelley and Harris Francis; Chambers-Sanders Trust Lands Place Names Pilot Study: Meeting Research and Management Aims  
 9:00 Roger Anyon and Lawrence C. Todd; Digging Where There's Nothing: Off Site Trenching and Archaeological Survey  
 9:15 Reid Nelson; Resource Avoidance and 106: Must They Go Hand in Hand?  
 9:30 Mark B. Sant and Andrew P. Fowler; The Development of an Anasazi Redware Tradition: The Regional Implications of Showlow Redware  
 9:45 Elizabeth Skinner; Early Points on Late Sites: Functional Continuity, Scavenging, or Curation?  
 10:00 BREAK  
 10:10 Marianne Marek and Mark B. Sant; Architectural Variability in Pueblo II Pitstructures: An Example from the N2007 Project, Apache Country, Arizona  
 10:25 Miranda Warburton; Archaeological Research at the Navajo Springs Great House  
 10:40 Donna K. Graves; Conservation or Development: A Balancing Act  
 10:55 Larry Benallie and Anthony L. Klesert; How Research and Management Aims are Being Merged on the Navajo "New Lands"  
 11:10 Discussants: George Gumerman and Veletta Canouts

**[09] Symposium: NEW PERSPECTIVES ON EARLY CERAMICS AND FORMATIVE CULTURE IN THE AMERICAS**

Room H

Organizer and Chairperson: John W. Hoopes

Participants

- 8:00 Jonathan Damp and Patricia Vargas; Altomayo and Real Alto: The Early Ceramics of Coastal Ecuador  
 8:20 Camilo Rodriguez; Las Tradiciones Alfareras Tempranas en la Costa Caribe Colombiana  
 8:40 Augusto Oyuela and James Zeidler; The Early Formative Cultures of Northwestern South America: Ceramic Change and Assemblage Diversity Compared  
 9:00 Richard G. Cooke and Patricia Hansell; Early Pottery in Central Panama  
 9:20 John W. Hoopes; The Contexts of the Earliest Ceramics in Costa Rica and Nicaragua  
 9:40 LeRoy V. Joesink-Mandeville; The Interface of Formative Ceramic Traditions in Honduras: The Perspective from Yarumela  
 10:00 BREAK  
 10:10 Barbara Arroyo; Early Ceramics from El Salvador: Sitio El Carmen  
 10:30 Mary E. Pye; The Earliest Ceramics and Complex Societies of Guatemala  
 10:50 John Clark and Michael Blake; The Development of Early Formative Ceramics in the Soconusco, Chiapas, Mexico  
 11:10 Joyce Marcus; Oaxaca's First Ceramics  
 11:30 Discussant: Prudence M. Rice

**THURSDAY AFTERNOON APRIL 19, 1990**

**[11] General Session: THE EFFECTS OF EUROPEAN EXPANSION IN NORTH AMERICA**

Room B

Participants

- X 1:00 John Scarry; Settlement Hierarchies and Administrative Hierarchies: Reconciling Archaeology, Ethnohistory, and Theory for the Apalachee Chiefdom  
 1:20 Brona G. Simon; Native American Culture Change and Persistence in Contact Period New England: Analysis of Mortuary Data from a Praying Indian Burial Ground in Massachusetts  
 1:40 James Richard Jones, III; Archaeological and Ethnohistoric Evidence of Potawatomi Occupations in a "Refuge" Area in Northwestern Indiana  
 2:00 Peter Bleed and Daniel R. Watson; Frontier Flintlocks: A Fault Tree Analysis of Firearm Use at Contact Period Sites of the Great Plains  
 2:20 Ann L.W. Stodder; Paleoepidemiology of Eastern and Western Pueblo Communities in Early Contact Period New Mexico  
 2:40 Lisa Kealhofer; Acculturation and Institutional Diversity on the Spanish Colonial Frontier: Archaeology in El Pueblo de Los Angeles  
 3:00 BREAK  
 3:10 John Johnson, Daniel O. Larson and Joel Michaelsen; Climatic Variability, Resource Productivity, Missionization in South Central California: Explanatory Considerations  
 3:30 Louise Jackson; Household Necessities or "Things that the Natives did not in the Least Need": Teacups and Culture Change in Nineteenth Century Southwestern Alaska  
 3:50 Everett Bassett; Spatial Analysis of Apache Social Organization  
 4:10 Margie Akin; Possibilities and Pitfalls: Site Dating Using Asian Coins in Western North America  
 4:30 Ezra Zubrow; Routes of Extinction—Pockets of Survival  
 4:50 Harry Holstein and Phillip Koerper; The Battle of Tallasseehatchee, An Archaeological Investigation into an Early Creek War Massacre

**[12] General Session: MAYAN ECONOMIC AND POLITICAL ORGANIZATION**

Room C

Participants

- 1:00 Brian R. McKee; Architecture and the Use of Space at the Cerén Site, El Salvador  
 1:20 Kelli Carmean; Architectural Labor Investment and Social Status at Sayil, Yucatan, Mexico  
 1:40 John D. Wingard; The Role of Soils in the Developmental Sequence at Copan, Honduras  
 2:00 John Mallory; El Duende: Evidence for specialized production in the Copan Valley, Honduras  
 2:20 Stephen Whittington and Scott Zeleznik; Growth Trajectories of Neighboring Rural Elite Residential Compounds in the Ostuman Pocket, Copan, Honduras  
 2:40 Peter S. Dunham; The Segmentary Organization of the Classic Maya of the Southern Lowlands  
 3:00 BREAK  
 3:10 Olivier De Montmollin; Patterns of Political Centralization in Two Upper Grijalva Basin Maya Polities  
 3:30 Dennis E. Lewarch; Late Postclassic Economic Organization in the Coatlan del Rio Valley, Morelos, Mexico  
 3:50 George Bey, Craig Hanson and Rachel Hamilton; The Postclassic at Ek Balam: The View from Structure 12  
 4:10 William M. Ringle, Carlos Peraza Lope, Gabriel Euan Canul and David Ortegon Zapata; Ek Balam and its Dependencies: Results of the 1989 Settlement Survey  
 4:30 David Lentz; Archaeobotanical Remains from the Copan Valley, Honduras  
 4:40 Walter R.T. Witschey and Elia del Carmen Trejo A.; Muyil Settlement Patterns: A Model for the East Coast Postclassic

## Thursday Afternoon, April 19

**[13] Symposium: SAVE THE PAST FOR THE FUTURE**

Room I

Organizer: Loretta Neumann

Organizer and Chairperson: Annetta L. Cheek

**Participants**

- 1:00 Annetta L. Cheek and Loretta Neumann; The SAA's Save the Past for the Future Project  
 1:20 W. James Judge; Saving the Past for Ourselves  
 1:40 Christine Christensen; Understanding and Controlling Vandalism and Destruction of Cultural Resources  
 2:00 Shereen Lerner; Preventing the Problem of Archaeological Site Vandalism  
 2:20 Martin McAllister, Evan I. DeBlois, Cheryl Ann Munson and Richard C. Waldbauer; Combatting the Problem of Looting and Vandalism of Archaeological Sites  
 2:40 Prudence M. Rice; The Society for American Archaeology and the Anti-looting Effort

**[14] Symposium: SEASONAL USE OF SITES BY AGRICULTURALISTS**

Room I

Organizers and Chairpersons: Lisa C. Young and E. Charles Adams

**Participants**

- 3:15 William Merrill and Martha Graham; Tarahumara Residential Moves: Mobility Strategies Among Subsistence Agriculturalists  
 3:35 Patricia A. Gilman; Settlement Patterns and the Seasonal Use of Pit Structures  
 3:55 Lisa C. Young; Pithouses and Fieldhouses: A Comparison  
 4:15 Kathleen Berger, Alan P. Sullivan, III and Christian E. Downum; When is a Fieldhouse? Interpretations of Single-Room Structures at Wupatki National Monument  
 4:35 Richard C. Lange and E. Charles Adams; The Evidence for Seasonal Use of Homol'ovi III, a 13th and 14th Century Pueblo from Northeastern Arizona  
 4:55 John R. Welch; Seasonality and Adaptive Strategies in the Circum-Sonoran Uplands  
 5:15 Discussant: Shirley Powell

**[15] Symposium: RECENT RESEARCH IN THE LARGO-GALLINA REGION OF NORTH-CENTRAL NEW MEXICO**

Room J

Organizers and Chairpersons: Larry L. Baker and Kristin Langenfeld

**Participants**

- 1:00 Cindy J. Bunker; Archaeology in the Largo-Gallina Region: The Last 70 Years  
 1:20 Andrew R. Gomolak; What We Think We Know vs. What We Have to Learn: Lift Up Thine Eyes Unto The Hills  
 1:40 Florence Hawley Ellis and Andrea Ellis Dodge; Some Distinctive Traits of the Largo-Gallina Culture in the Rattlesnake Ridge Area  
 2:00 Terry Knight; Largo-Gallina Ceramics: Inter/Intra Site Variability in Cultural and Technological Attributes  
 2:20 Richard Sleeter; New Mexico's Vanished Tower Dwellers Revisited  
 2:40 Andrea Ellis Dodge; Towers of the Gallina Area and Greater Southwest  
 3:00 BREAK  
 3:10 Cheryl Muceus and Bob Lawrence; Here, There, Everywhere: A Site Location Study of Gallina Sites Reported from Surveys for the Boot Jack Timber Sale  
 3:30 Larry L. Baker and Kristin Langenfeld; Living on the Edge: Largo-Gallina Communities Along the Continental Divide  
 3:50 William J. Whatley; Gallinasazi? Investigating Who on the Basis of What and Where  
 4:10 Discussants: Florence Hawley Ellis and Phillip H. Shelley

**[16] Symposium: CELTIC CHIEFDOM—CELTIC STATE**

Room G

Organizers and Chairpersons: D. Blair Gibson and Bettina Arnold

**Participants**

- 1:00 Nerys Patterson; Not Primordial: Clans, Population Distribution, and Political Organization in Early Medieval Ireland

## Thursday Afternoon, April 19

- 1:20 Sean Dunham; Veni, Vidi, Ethnography?: Caesar and Socio-Political Systems in Gaul  
 1:40 Richard Bradley; The Passage of Arms: Votive Deposits as an Index of Political Change  
 2:00 Michael Dietler; A Comparative Perspective on 'Celtic' Socio-political Systems from the 'Celto-Ligurian' Periphery  
 2:20 John Collis; States Without Centers? The Middle La Tène Period in Temperate Europe  
 2:40 Olivier Buchsenschutz; The Significance of Major Settlements in Iron Age Society  
 3:00 BREAK  
 3:10 Franz Fischer; The Early Celts of West Central Europe (6th/5th c. BC): The Semantics of Social Structure  
 3:30 Colin Haselgrave; Late Iron Age Society in Britain and North-West Europe: Structural Transformation or Superficial Change?  
 X 3:50 Carole L. Crumley; A Critique of Cultural Evolutionist Approaches to Ranked Society, with Particular Reference to Celtic Polities  
 4:10 Discussant: Timothy K. Earle

**[17] Symposium: ANASAZI REGIONAL ORGANIZATION AND THE CHACO SYSTEM**

Room 2 &amp; 3

Organizer and Chairperson: David E. Doyel

**Participants**

- 1:00 David E. Doyel and Stephen H. Lekson; Regional Organization and the Chaco System  
 1:20 Tom Windes and Dabney Ford; The Early Bonito Phase in the Chaco Canyon Area  
 1:40 John R. Stein and Stephen H. Lekson; Anasazi Ritual Landscapes  
 2:00 Andrew P. Fowler and John R. Stein; The Anasazi Great House in Time and Space  
 2:20 John Roney; Prehistoric Roads and Regional Integration in the Chacoan System  
 2:40 Peter J. McKenna and H. Wolcott Toll; Anasazi Community Structure in the Animas, La Plata, San Juan Area, New Mexico  
 3:00 BREAK  
 3:10 Douglas D. Dykeman; Room for a View: Chaco Canyon from the Chuska Slope  
 3:30 H. Wolcott Toll and Eric Blinman; Chaco in the Context of Ceramic Regional Systems  
 3:50 Lynne Sebastian; Chaco Canyon and the Anasazi Southwest: Changing Views of Sociopolitical Organization  
 4:10 Discussants: Gary M. Feinman and W. James Judge

**[18] Symposium: HOLISTIC ARCHAEOLOGY: BEYOND THE MATERIALIST-IDEALIST OPPOSITION**

Room F

Organizers and Chairpersons: A. C. Roosevelt and Samuel M. Wilson

**Participants**

- X 1:00 William Fash, Jr.; The Holistic Approach to Classic Maya Studies: The Copan Example and Its Implications  
 1:30 Gary M. Feinman; Archaeology Without a Capital 'D': The Case of Oaxaca  
 1:50 A. C. Roosevelt; Holistic Archaeology in Amazonia  
 2:10 J. Daniel Rogers; The Material Implications of Culture Contact: The Arikara Case  
 2:30 Peter R. Schmidt; Holistic Archaeology: A Natural Alternative to the Processual/Post-Processual Dichotomy  
 2:50 Discussant: Samuel M. Wilson

**[19] Symposium: TIGER ON THE HORIZON: A REEXAMINATION OF "CHINESE INFLUENCES" ON THE MANCHURIAN BASIN AND KOREAN PENINSULA**

Room F

Organizer and Chairperson: Gina L. Barnes

**Participants**

- 3:10 Gina L. Barnes; The Yellow Sea Interaction Sphere  
 3:30 Sarah Nelson; Echoes of Ethnicity in the Korean Peninsula and Manchuria 6000–2000 B.C.

- 3:50 Lothar A. von Falkenhausen; The State of Yan and its Northeastern Connections  
 4:10 Hyung Il Pai; Cultural Interaction between the Lelang Commanders and Iron Age Koreans  
 4:30 Sarah Taylor; A Cast-Iron Case of Diffusion? Influences and Innovation in Ancient Korean Iron Production  
 4:50 Discussants: Bong-won Kang and David Goodman

**[20] Symposium: GAMBLING ON AGGREGATION: RISKS AND REASONS FOR THE FORMATION OF AGGREGATED COMMUNITIES IN PRESTATE SETTINGS**

Room H

Organizers and Chairpersons: Richard H. Wilshusen and Michael Adler

**Participants**

- 1:00 Michael Adler; Population Aggregation and the Changing Social Landscape: Late Prehistoric Anasazi Settlements on the Northern Colorado Plateau  
 1:20 Richard H. Wilshusen and Mark D. Varien; Hamlets and Villages in Prestate Settings: A Worldwide Perspective  
 1:40 Edward Banning; The Social Structure of Neolithic Villages in the Near East  
 2:00 Jeffrey Quilter; Community Forms and Social Systems in the Early Andes  
 2:20 Daniel Everett; Small, Medium, Large, and Jumbo: Settlement Size and Socio-Economic Evolution in the Neolithic of Southeastern Italy  
 2:40 John Cable; Factors Influencing Early Hohokam Village Formation in the Phoenix Basin, Arizona  
 3:00 BREAK  
 3:10 David R. Wilcox; Factors Affecting the First Appearance of Sinagua Villages  
 3:30 Dennis L. Toom; The Best of Both Worlds: Historic, Economic, and Climatic Factors Related to Early Village Formation in the Middle Missouri Subarea of the Plains  
 3:50 Vince Holzhall and Glenn Davis Stone; Dispersed Settlements, Invisible Villages  
 4:10 Discussant: Henry T. Wright, III

**THURSDAY EVENING APRIL 19, 1990**

**[21] Plenary Symposium: FROM KOSTENKI TO CLOVIS: STALKING THE MAMMOTH HUNTERS**

Room F, G & H  
 Organizer: Olga Soffer

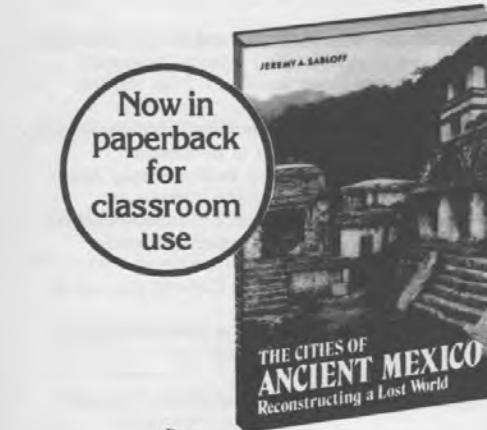
**Participants**

- 8:00 Vadim Mikhailovich Masson; Soviet Paleolithic Archaeology Today and Prospects for Soviet-American Collaboration  
 8:20 Nikolai Dmitrievich Praslov; Upper Paleolithic Adaptations in Eastern Europe  
 8:40 George C. Frison; Clovis Hunters and their Prey: PaleoIndian Adaptations in North America  
 9:00 Clive Gamble; The Center at the Edge

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**FRIDAY MORNING APRIL 20, 1990****[22] Poster Session: CERAMIC ANALYSIS, AND NORTH AMERICAN SETTLEMENT STUDIES**

Room D

**Participants**

- Meredith Aronson, James M. Skibo and Miriam Stark; Production and Use Technologies of Kalinga Cooking Pots: An Ethnoarchaeological and Materials Science Perspective  
 Lisa DeLeonardis Holley; Paracas Settlement in the Lower Ica Valley, Peru, 5th–1st Centuries, B.C.  
 John Lindly, C. Michael Barton and Steven E. Falconer; A Preliminary Lithic Analysis of Early and Middle Bronze Age Industries from Two Village Sites in the Levant  
 Alan H. Simmons; Neolithic Adaptations in the Eastern Levant: Evidence from 'Ain Ghazal and Wadi Shu'eib, Jordan.  
 Ilse Kohler-Rollefson; Stages in Pastoral Development During the Levantine Neolithic  
 Christopher Edens; An Archaeological Landscape in Oman and Regional Human Adaptations  
 Sandra L. Lopez Varela; The Yaxchilan Ceramic Sequence and Its Cultural Context in the Maya Area  
 Elizabeth Henrickson; Residue Analysis and Usage Interpretation of a Morphologically Distinctive Ceramic Vessel Type from Chalcolithic Central Western Iran  
 Frances Pickin; The Archaeology of Camp Followers  
 Kolleen Kralick; Historical Archaeology in the Black Range of New Mexico: Isolated Settlements and Economic Frontiers  
 Christopher Everett Hamilton; Data Recovery at Wlf-Ha-l, Shipwreck Site of the Whydah Gally Pirate Vessel Lost off Wellfleet, Cape Cod in 1717  
 Arley W. Simon; Variation and Commonality Among Salado Wares in Central Arizona  
 Owen Lindauer; Possible Functions of Prehistoric Decorated Vessels: An Example from the Hohokam Whole Vessel Study  
 Maria Nieves Zedeno and Lawrence Anovitz; Image Processing: An Alternative Technique for Identifying the Provenience of Prehistoric Ceramics from Chodistaas, East-Central Arizona  
 Christopher Carr and Jean-Christophe Komorovsky; Identifying Ceramic Temper Mineralogy with X-Radiography: Advantages and Limitations  
 James B. Stoltman; Petrographic Thin Section Analysis as a Tool for Documenting Cultural Interaction: An Example from the Upper Mississippi Valley  
 Mark A. Neupert and William A. Longacre; Does the Craftsperson Know Best?: Ceramic Use-Life Studies and Informant Accuracy  
 Judith A. Habicht-Mauche; Pottery Manufacture and Trade at Arroyo Hondo Pueblo (LA 12), New Mexico  
 Chantal Cagle; Pottery Production in Iron Age England: Results of ICP Analysis  
 John Blitz; Ceramic Attributes as a Measure of Mississippian Mound Activities  
 Nina Borremans; Prehistoric Coastal Settlement in the Cedar Keys, Florida  
 Robert Lafferty, Robert Cande and Michael Sierzchula; Late Archaic Adaptation to the Boston Mountain-Springfield Plateau Interface in Northwest Arkansas  
 Anne Frazer Rogers; The Ela Site (31Sw5); A Prehistoric Southern Appalachian Village  
 Gary Coupland; The Point Grey Site: A Special Activity Component of the Marpole Culture in Southwestern British Columbia  
 Elizabeth A. Morris and Richard C. Blakeslee; Carey Lake, 5LR 130, A High-Altitude Paleoindian Site in Northern Colorado

**[23] Symposium: COLUMBIAN CONSEQUENCES, PART II: RETROSPECTIVE ON A CENTURY OF BORDERLANDS SCHOLARSHIP**

Room B

- Organizer: David Hurst Thomas  
 Organizer and Chairperson: Don D. Fowler

**Participants**

- 8:00 Dora Crouch; Roman Models for the Hispanic Colonization of the New World

- 8:20 Raymond D. Fogelson; Anthropology at the World's Columbian Exposition, Chicago 1893–1894  
 8:40 Curtis M. Hinsley; Mesoamerican Archaeology and the Chicago World's Fair  
 9:00 Ira Jacknis; The World's Columbian Exposition and Northwest Coast Indian Culture  
 9:20 Don D. Fowler and Catherine S. Fowler; The Uses of Natural Man in Natural History  
 9:40 David Hurst Thomas; Mission Revival Architecture as Instant Archaeology

**[24] General Session: SOUTHWESTERN PREHISTORY**

Room B

**Participants**

- 10:15 William D. Lipe and Stephen H. Lekson; Pueblo Cultures in Transition: Report of a Conference  
 10:35 Steven Shelley; Basketmaker III Social Organization: An Evaluation of Population, Aggregation and Site Structure  
 10:55 Thomas N. Motsinger; Craft Specialization in the Galisteo Basin, New Mexico

**[25] General Session: STUDIES IN SOUTH AMERICAN ARCHAEOLOGY**

Room C

**Participants**

- 8:00 Lawrence Kuznar; Late Archaic Llama Herding in the High Sierra of the South Central Andes  
 8:20 Anne Helsley-Marchbanks; The Inca Presence in Chayanta, Bolivia: The Metallurgical Component  
 8:30 John G. Jones; Preceramic Subsistence Patterns on the Central Coast of Peru: The Coprolite Evidence  
 8:50 Karen Wise and Niki Clark; The Cotton Preceramic Period in the South-Central Andes  
 9:10 Brian R. Billman; Problems in the Timing and Tempo of the Evolution of Complex Societies on the Coast of Peru  
 9:30 Glenn S. Russell; Preceramic through Moche Settlement Pattern Change in the Chicama Valley, Peru  
 9:40 Banks L. Leonard; Moche through Late Horizon Settlement Patterns; Chicama Valley, Peru  
 9:50 Thomas Pozorski and Shelia Pozorski; Excavations at Bahia Seca, Casma Valley, Peru: Results of the 1989 Field Season  
 10:00 Thomas Alete; Sociopolitical Divisions Among the Late Prehistoric Punaes of Coastal Ecuador  
 10:20 Francisco Mena; Rio Ibanez Project: Foraging Systems on the Patagonian Forests  
 10:30 Luis Alberto Borrero; Divergent Evolution on the Strait of Magellan (Fuego-Patagonia)?

**[26] Plenary Symposium: SAVE THE PAST FOR THE FUTURE**

Room F

Organizer and Chairperson: Annetta L. Cheek

**Participants**

- 11:15 Annetta L. Cheek; Introductory Remarks  
 11:30 Constance Harriman; Archaeologist and Federal Managers—Opportunities for Alliance  
 11:45 Jean Auel; Partners in Preservation: Romancing the Public  
 12:00 Ray White; Building Cooperation between Indians and Archaeologists  
 12:15 Peter Pilles; Arizona Site Stewards: Partners in Protection  
 12:30 Michael Johnson; Many Relic Hunters are People Too

**[27] Symposium: PERSONAL MORALS AND DISCIPLINARY IMPERATIVES: ETHICAL ARCHAEOLOGY AND ARCHAEOLOGICAL ETHICS**

Room I

- Organizer: Kathryn V. Reese  
 Organizer and Chairperson: Douglas B. Bamforth

**Participants**

- 8:00 Fred Valdez, Jr., Kathryn V. Reese and Douglas B. Bamforth; Ethical Archaeology and Archaeological Ethics

- 8:20 Robert J. Mallouf; Reflections on the Ethics of Archaeological Excavation  
 8:40 Judith G. Propper; Saving or Shortchanging the Past: Ethical Issues in Public Archaeology  
 9:00 Ben Rhodd; Anthropological Ethics: A Perspective  
 9:20 Lynne Goldstein and Keith Kintigh; Reburial and Repatriation: The Ultimate Ethical Dilemma  
 9:40 Phyllis Mauch Messenger; International Collections and Ethical Relationships  
 10:00 Anthony J. Mills and Elizabeth Graham; Ethics and Archaeology Abroad: People or Politics?  
 10:20 Discussant: Thomas R. Hester

[28] Symposium: THE ARCHAIC OF THE SOUTHWESTERN UNITED STATES AND NORTHERN MEXICO

Room J  
 Organizer: Harry J. Shafer  
 Chairpersons: David L. Carlson and Michael R. Waters

**Participants**

- 8:00 Harry J. Shafer and Vaughn M. Bryant, Jr.; Southern North American Archaic Cultural and Environmental Dynamics: Introduction  
 8:20 W. Geoffrey Spaulding; Paleoecology of Southwestern North America: The Last 15,000 Years  
 8:40 Ernest L. Lundelius; Pleistocene and Holocene Faunal History of the Southern Deserts of North America  
 9:00 Thomas R. Hester; The Archaic Coast to Coast: Examining Archaic Patterns from Southern California to the Gulf of Mexico  
 9:20 Kristin D. Sobolik, D. Gentry Steele and Vaughn M. Bryant, Jr.; Dietary Analysis of the Archaic Foragers of Southern North America  
 9:40 D. Gentry Steele and Joseph F. Powell; An Osteological Examination of Prehistoric Hunters and Gatherers of the Southern Desert and Semi Desert Regions of North America  
 10:00 Bill Griffen; Arid America at Contact, An Ethnographic Review  
 10:20 Discussants: Gary P. Nabhan and Kent Flannery

[29] Symposium: THE ARCHAEOLOGY OF SPATIAL ORGANIZATION IN EUROPE

Room G  
 Organizer and Chairperson: Peter S. Wells

**Participants**

- 8:00 Matthew L. Murray; "Fields" of Discourse: The Evolution of Social Space During the Bronze/Iron Age Transition in Central Europe  
 8:20 Bettina Arnold; An Intrisite Analysis of Ceramic Material from the Heuneburg: Decoding Early Iron Age Social Organization  
 8:40 Peter S. Wells; Industry and Changing Spatial Patterns at Iron Age Urban Settlements  
 9:00 Pam J. Crabtree; The Use of Environmental Space in Early Anglo-Saxon England: The Zooarchaeological Evidence  
 9:20 Barbara Scott; Viking Houses and the Viking Spirit  
 9:40 John Kudlik; Spatial Organization of the Medieval Skania Fairs: 1100-1500 A.D.  
 10:00 Sheila Bonde and Clark Maines; Between Town and Country: The Role of the Suburban Parish in Early Medieval Soissons  
 10:20 D. Blair Gibson; The Spatial Expression of Early Irish Political Systems  
 10:40 Sinead Ni Ghabhlaín; Church and Society in Early Historic Ireland

[30] Symposium: FIRES AND THE ARCHAEOLOGICAL RECORD: DEPOSITIONAL AND POST-DEPOSITIONAL FORMATION PROCESSES

Room 2 & 3  
 Organizers and Chairpersons: Kenneth P. Cannon and Melissa A. Connor

**Participants**

- 8:00 Stanley Ahler, Paul R. Picha, Robert W. Seabloom and Rodney D. Sayler; Effects of Prairie Fire on Selected Artifact Classes

- 8:20 Randy Bellomo; Identifying Traces of Natural and Humanly Controlled Fire in the Archaeological Record: The Role of Actualistic Studies  
 8:40 Melissa A. Connor and Kenneth P. Cannon; Forest Fires as a Site Formation Process in the Rocky Mountains of North-western Wyoming  
 9:00 Jack Smith; Impacts of Wildfire on Archaeological Sites at Mesa Verde  
 9:20 James Wettstaed and Halcyon LaPoint; Short and Long Term Effects on Site Preservation Due to Wildfires  
 9:40 Thomas Whyte; An Experimental Study of Burned Fish Bones from Archaeological Sites  
 10:00 Discussants: Julie K. Stein and LuAnn Wandsnider

[31] Symposium: BEYOND STRUCTURALISM AND THE SYMBOLIC: KEY THEMES AND DIRECTIONS IN POST-PROCESSUAL ARCHAEOLOGY

Room F  
 Organizer and Chairperson: Michael Shanks

**Participants**

- 8:00 Ian Hodder; The Role of Interpretive Prehistory  
 8:20 Trevor Kirk; Symbolic Texts and Gender Relations: Early Farmers in N. France  
 8:40 Mark Edmonds; Situating the Production and Exchange of Stone Tools in the British Neolithic  
 9:00 Ian Bapty; Overcoming Archaeology: History and Structure in the British Neolithic and Bronze Age  
 9:20 John Barrett; The Meaning of Things: A Consideration of the Archaeological Treatment of the 'Beaker Phenomenon'  
 9:40 Michael Shanks; Material Culture and Writing the Past: Aspects from Archaic Greece  
 10:00 Matthew Johnson; Technical and Social Systems in England: 1400-1700 AD  
 10:20 Discussants: Julian Thomas and Chris Tilley

[32] Symposium: PREHISTORIC HUNTER-GATHERER ADAPTATIONS ON THE INTERIOR PLATEAUS OF NORTHWEST AMERICA

Room H  
 Organizer and Chairperson: James C. Chatters

**Participants**

- 8:00 Frank C. Leonhardy; With Apologies to V. Gordon Childe: New Light on the Most Ancient Plateau  
 8:20 Virginia L. Butler; The Dalles Roadcut Salmon Bones: Natural or Cultural?  
 8:40 Mike K. Rousseau; Changes in Human Sedentism, Mobility, and Subsistence During the Plateau Pithouse Tradition on the Canadian Plateau  
 9:00 James C. Chatters; Climatic Cooling and the Development of Collector Strategies on Columbia Plateau  
 9:20 Jerry R. Galm; A Review of Late Period Prehistory in the Columbia Plateau  
 9:40 Brian D. Hayden; Prehistoric Cultural Complexity and Corporate Groups Along the Midfraser River, British Columbia  
 10:00 Kenneth C. Reid, John A. Draper and Peter E. Wigand; Hunter Gatherer Intensification in Eastern Oregon: Evidence from the Silvies Plateau and Joseph Upland  
 10:20 Alston V. Thoms; Root-Foods and Hunter-Gatherer Intensification: The Role of Camas in the Pacific Northwest  
 10:40 Discussants: R. Lee Lyman, William S. Dancey and Kenneth M. Ames

FRIDAY AFTERNOON APRIL 20, 1990

[33] Poster Session: ADVANCES IN HYDRATION ANALYSIS AND CHEMICAL CHARACTERIZATION (ORGANIZER: J E ERICSON), SOUTHWESTERN ARCHAEOLOGY, PETROGLYPH ANALYSIS

Room D

**Participants**

- Irving Friedman, Fred Tremour and Franklin Smith; Obsidian Hydration Rates as a Function of Relative Humidity

## Friday Afternoon, April 20

- Kim Tremaine; The Complexities of Glass Surface Reactions and Implications for Obsidian Dating
- Elizabeth Skinner and Robert J. Jackson; A Critical Review of Obsidian Hydration Sampling Strategies in California and the Great Basin
- Gregory A. Pope; Quartz Hydration of Glacial Tills, Eastern California, as a Dating Tool
- Jonathon E. Ericson and Jerome Kimberlin; Chemical Differentiation of Flows and Source Areas in California by Instrumental Neutron Activation and Statistical Analyses
- M. Steven Shackley; Early Hunter-Gatherer Procurement Ranges and Mobility in the American Southwest: Evidence from Obsidian Geochemistry and Lithic Technology
- Jay R. Newman; Notes on the X-Ray Fluorescence Characterization of the Rhyodacite Sources of the Taos Plateau, New Mexico
- Alison E. Rautman; Coping with Environmental Variability: Social Networks and Ceramic Exchange at the Kite Site, Central New Mexico
- Stephen R. Durand, Phillip H. Shelley, Fred L. Nials and Martin R. Rose; Tree Sourcing in the San Juan Basin, Initial Results
- Curtiss T. Brennan, Paul R. Fish and Suzanne K. Fish; Marana: Configuration of a Classic Period Hohokam Platform Mound Site
- Mark D. Varien; Methodological Issues in Assessing Site Use-Life and Occupational Continuity in the American Southwest
- Paul E. Minnis and Michael Whalen; Casas Grandes, Chihuahua, in Regional Context
- Helen C. Fairley and Phil R. Geib; Dating Fremont Anthropomorphic Rock Art in Glen Canyon, Southeast Utah
- David Abbott and David M. Schaller; Hohokam Ceramic Exchange Within the Salt River Valley, Arizona: Results from the Hohokam Expressway Project
- Sally Greiser, T. Weber Greiser and David Putnam; Prehistoric Irrigation in the Taos Valley, New Mexico
- John E. Douglas; Settlement Instability in the Late Prehistoric Northern Sierra: Implications from the Boss Ranch Site, Southeastern Arizona
- Bruce D. Lounshin, Dale Davidson and Craig Harmon; Cedar Mesa/Grand Gulch Management: Saving an Archaeological Treasurehouse from "Indiana Jones"
- Susan A. Johnston; Symbolic and Spatial Aspects of Prehistoric Irish Petroglyphs
- William D. Hyder; Locational Attributes in Rock Art Studies
- Julie Francis and George C. Frison; Age and Chronology of Rock Art in northwestern Wyoming and Implications for Its Changing Role in Shamanism
- Jim Huffman and Carl J. Phagan; Archaeological Evidence Associated with a Newly Reported Barrier Canyon-Related Rock Art Style in the Western Grand Canyon

## [34] Symposium: ALASKAN NATIVE DISPERSAL AROUND THE NORTH PACIFIC UNDER THE RUSSIAN-AMERICAN COMPANY: ARCHAEOLOGICAL EVIDENCE

## Room B

Organizers and Chairpersons: Glenn J. Farris and Kent Lightfoot

## Participants

- 1:00 Glenn J. Farris; Overview of Native Alaskan Dispersal in the North Pacific
- 1:20 Francis A. Riddell; Excavations at the Farralon Artel, California
- 1:40 Kent Lightfoot; Koniags in California: Excavations at Fort Ross, California
- 2:00 Aron Crowell; Three Saints Bay, Kodiak Island, Alaska: Research Design in Colonial Sites Archaeology
- 2:20 Richard Knecht; Excavations of Russian-Koniag Contact Period Sites on Kodiak Island
- 2:40 William S. Laughlin, A. B. Harper and S. B. Laughlin; Massacre of the Medvedev Promyshlenniks, 1764 AD
- 3:00 Valery O. Shubin; The Material and Spiritual Culture of Kodiak Eskimos (Aleuts) on the Kurile Islands

## [35] General Session: CONTRIBUTIONS TO CALIFORNIA ARCHAEOLOGY

## Room B

## Participants

- 3:40 Joanne Mack; Siskiyou Utility Ware: An Horizon Marker of the Late Prehistoric Period for the Western Cascades of California and Oregon

## Friday Afternoon, April 20

- 4:00 Julia Hammett; Chumash Paleoethnobotany: Sedentism Without Agriculture
- 4:20 Ronald F. King; Conceptual Units and the "Shasta Complex" of Interior Northern California
- 4:40 Jeanne E. Arnold; The Emergence of a Complex Political Economy and Linkage to Environmental Stress in Prehistoric Coastal California
- 5:00 Richard S. Ciolek-Torrello and Jeffrey H. Altschul; Prehistoric Exploitation of a Southern California Coastal Lagoon

## [36] Symposium: RECONSTRUCTING SOCIAL ORGANIZATION AT THE HOUSEHOLD LEVEL IN MESOAMERICA

## Room C

Organizers and Chairpersons: Melissa Diamanti and Nancy Gonlin

## Participants

- 1:00 Patricia A. Urban and Edward M. Schortman; Late Classic Activity Distribution and Social Organization at the Site Level in Two Regions of Southeastern Mesoamerica
- 1:20 Michael P. Smyth; Reconstructing the Past by Reference to the Present: The Social Implications of Household Activity Organization at Sayil, Yucatan, Mexico
- 1:40 Patricia A. McAnany and Valerie McCormack; Dynamics of Household Growth and Social Heterogeneity at Sayil, Yucatan
- 2:00 Randolph J. Widmer and James J. Sheehy; Archaeological Implications of Architectural Changes in the Development Cycle of a Modern Pottery Workshop in Teotihuacan
- 2:20 Eleanor King; Maya Household Organization and the Problem of Isolated Mounds: A Perspective from Colha, Belize
- 2:40 Julie C. Benyo; Ceramics and Precolumbian Community Patterning
- 3:00 BREAK
- 3:10 Robert Santley; Prehispanic Residential Organization in the Basin of Mexico in the Formative and Classic Periods
- 3:30 Nancy Gonlin; Household Dynamics at Copan
- 3:50 Melissa Diamanti; Social Organization of an Elite Household at Terminal Classic Copan: Testing the Data Against Models
- 4:10 Discussants: Gair Tourtellot and Wendy Ashmore

## [37] Symposium: CURRENT ISSUES IN ARCHAEOLOGICAL SITE PROTECTION AND PRESERVATION

## Room I

Organizer and Chairperson: Paul R. Nickens

## Participants

- 1:00 Fredrick L. Briuer; Geographic Information Systems: A Tool for Evaluating and Protecting Archaeological Sites
- 1:20 James B. Walker; The Innovative Management of Privately Owned Archaeological Preserves
- 1:40 Paul R. Nickens; Research Orientations for Preserving Archaeological Properties at Corps of Engineers' Water Resources Projects
- 2:00 Mark Lynott and Jeffrey Richner; The Status of Archaeological Site Preservation in the National Park System
- 2:20 Jim Maxon; From Water Development to Environmental Management: Reclamation's Changing Role
- 2:40 Stephen Fosberg; The Challenge of Managing Cultural Resources within a Wilderness Setting
- 3:00 BREAK
- 3:10 Michael Kaczor; Saving the Soil and Archaeological Site Protection Opportunities
- 3:30 Larry Nordby; Site Preservation Strategies at Canyon de Chelly
- 3:50 Peter J. Pilles, Jr.; Alpha to Omega: Past, Present, and Future Directions for Site Protection and Preservation in the U.S. Forest Service
- 4:10 Discussants: William D. Lipe and Roger Saucier

[38] Symposium: ALTERNATIVE ADAPTATIONS TO ARID ENVIRONMENTS: THE ARCHAEOLOGY OF THE SOUTHERN GREAT BASIN

Room J  
Organizer and Chairperson: David Rhode

**Participants**

- 1:00 David Rhode; Introduction: Aspects of the Cultural Environment of the Southern Great Basin
- 1:20 Peter E. Wigand, Martha L. Hemphill and Cheryl Nowak; Late Pleistocene and Holocene Climate Change in Southern Nevada
- 1:40 Mark E. Basgall and M. C. Hall; Adaptive Variation in the North-central Mojave Desert
- 2:00 Amy J. Gilreath and W. R. Hildebrandt; Prehistoric Human Occupation of the Coso Volcanic Field, Inyo County, California
- 2:20 Lonnie C. Pippin; Discerning Changing Patterns of Adaptation of Hunters and Gatherers in the Southern Great Basin
- 2:40 Stephanie D. Livingston and Fred L. Nials; Geomorphology and Archaeology of Ash Meadows, Nevada
- 3:00 Margaret M. Lyneis; An Anasazi Adaptation to the Desert Margin: Virgin Anasazi in Southern Nevada
- 3:20 Catherine S. Fowler; Ethnographic Subsistence Systems in Mojavian Environments in the Great Basin
- 3:40 Discussant: James F. O'Connell

[39] General Session: ISSUES IN FAUNAL ANALYSIS

Room J

**Participants**

- 4:10 Lee Ann Kreutzer; Bison Bone Density and Differential Bone Survivorship in the Archaeological Record
- 4:20 Alice M. Emerson; Archaeological Implications of Variability in the Economic Anatomy of Bison bison
- 4:40 Galen R. Burgett and James G. Enloe; Beasts and Burdens: Package Size Determinants in Differential Butchering Patterns

[40] General Session: MISCELLANEOUS PAPERS

Room G

**Participants**

- 1:00 Steven R. Ahler; Stratigraphic Sequences and Radiocarbon Dates From Modoc Rock Shelter, Illinois
- 1:20 Paul Thacker and Lawrence J. Jackson; Harold J. Cook and Jesse Figgins: A New Perspective on the Folsom Discovery
- 1:40 Evan Peacock; A Method of Distinguishing between Artifacts and Naturally-Flaked Stone
- 2:00 Carol Raish; Domestic Animals and Stability in Pre-State Farming Societies
- 2:20 James K. Feathers; An Evolutionary Interpretation for the Predominance of Shell Tempering in Late Prehistoric Southeastern Missouri Ceramics
- 2:40 David Yoon; An Archaeological Approach to Regional Political Structures

[41] General Session: WORKSHOP: FUTURE DIRECTIONS IN SOVIET-AMERICAN RESEARCH

Room F  
Organizer: Olga Soffer

**Participants**

- 3:45 Vadim Mikhailovich Masson;
- 4:15 Nikolai Dmitrievich Praslov;

[42] Symposium: LIFE ABOVE THE TREELINE: PATTERNS OF PREHISTORIC ALPINE LAND-USE IN WESTERN NORTH AMERICA

Room 2 & 3  
Organizer: Donald K. Grayson  
Organizer and Chairperson: Robert L. Bettinger

**Participants**

- 1:00 James B. Benedict; Alpine Game Drives and Intercept Hunting in the Colorado Front Range
- 1:20 David Hurst Thomas and Lorann S.A. Pendleton; High Altitude Archaeology at Alta Toquima Village (Nevada)
- 1:40 Robert L. Bettinger; Alpine Villages of the White Mountains, California
- 2:00 David William Zeanah; Pre-Village Alpine Land-Use in the White Mountains, California
- 2:20 Michael Delacorte; The Role of Population in Relation to Changes in the Use of Alpine and Other Marginal Environments in Eastern California
- 2:40 Donald K. Grayson; Great Basin Alpine Village Faunas
- 3:00 Richard E. Hughes; Obsidian Source Use in Great Basin Alpine Environments
- 3:20 Discussant: James F. O'Connell

[43] General Session: STUDIES IN FAUNAL TAPHONOMY

Room 2 & 3

**Participants**

- 3:45 Joseph Ezzo; The Reconstruction of Mammalian Foodwebs at Two Rockshelters: Implications for Paleodietary Analysis
- 4:05 Bryan Scott Hockett; Arachnid Taphonomy: Note on Scorpion Remains in Archaeological Context
- 4:15 Angela Linse and James H. Burton; Bone Solubility and Preservation in Alkaline Depositional Conditions
- 4:35 James M. Savelle and Allen P. McCartney; Prehistoric Thule Eskimo Bowhead Whale Utilization
- 4:55 David R. Huelsbeck; Whale Bones, Taphonomy, and the Question of Whale Hunting

[44] Symposium: THE SOCIAL IMPLICATIONS OF SYMBOLIC EXPRESSION IN THE PREHISTORIC AMERICAN SOUTHWEST

Room F  
Organizer: E. Charles Adams  
Organizer and Chairperson: Patricia L. Crown

**Participants**

- 1:00 J. J. Brody; Content, Context, Form and Media in the Prehistoric Art of the Southwest
- 1:20 Kelley A. Hays; Symbol-Minded Approaches to Prehistory: An Outline of Goals and Methods
- 1:40 E. Charles Adams; Origins of the Pueblo Katsina Cult: Iconographic Evidence
- 2:00 Sally J. Cole; Rock Art Evidence of the Presence and Social Significance of the Katsina Cult at Thirteenth-Fourteenth Century Homol'ovi
- 2:20 Helen Crotty; Protohistoric Anasazi Kiva Murals: Variation as a Reflection of Differing Social Contexts
- 2:40 Patricia L. Crown; Converging Traditions: Salado Polychrome Ceramics in Southwestern Prehistory
- 3:00 Polly Schaafsma; War Imagery and Magic: Petroglyphs at Comanche Gap, Galisteo Basin, New Mexico
- 3:20 Discussant: M. Jane Young

[45] Symposium: WRITING FOR POPULAR JOURNALS

Room G  
Organizer: Richard A. Wertime  
Organizer and Chairperson: Peter A. Young

**Participants**

- 3:45 Richard A. Wertime;

4:25 Peter A. Young,

[46] Symposium: FRYXELL SYMPOSIUM 1990: THE STATE OF INTERDISCIPLINARY RESEARCH IN ARCHAEOLOGY

Room H

Organizer and Chairperson: Katherine M. Moore

Participants

- 1:00 Katherine M. Moore; Opening Remarks
- 1:10 Charles L. Redman; Sampling, Seeds, and Philosophy: A Woman for All Seasons
- 1:30 Alison Wylie; "An Unexamined Life is not Worth Living": Forthright Realism and Scientific Practice in Archaeology
- 1:50 Julie K. Stein; The Context of Artifacts: Archaeology, Geoarchaeology, or Geology
- 2:10 Deborah M. Pearsall; Interdisciplinary Research in Archaeology: The Perspective from Paleoethnobotany
- 2:30 Richard W. Redding; Tactics of Pig Use in the Ancient Middle East: Modern Analogies and Archaeological Evidence
- 2:50 Katherine M. Moore; Complementary Strategies in Palaeoecology: Transition to Agriculture in South America
- 3:10 BREAK
- 3:20 William H. Marquardt; Interdisciplinary Research: The Critical Edge
- 3:40 Patty Jo Watson; Response to Papers
- 4:00 Discussant: Henry T. Wright

## SATURDAY MORNING APRIL 21, 1990

[47] Poster Session: LITHIC ANALYSIS, GEOARCHAEOLOGY

Room D

Participants

- Kristopher R. Carambelas and Shelly Raven; Don't Quarry, Be Happy! Actualistic Quarrying and its Implications for Social Organization at Tosawihi Quarries, Northern Nevada
- Peter Crew and Christine Hide; Pre-Roman Iron Production in North-West Wales
- Katherine Irene Wright; Ground Stone Assemblage Variation and Subsistence Strategies in the Near Eastern Levant, 22,000–5,500 B.P.
- Jonathan Davis, Alan H. Simmons, Rolfe Mandel, Gary O. Rollefson and Zeidan Kafafi; A Postulated Early Holocene Summer Precipitation Episode in the Levant: Effects on Neolithic Adaptations
- Michael McFaul; Assessing the Magnitude of Middle-Late Archaic Mesic Paleoclimatic episodes
- Patricia Price-Beggerly, Kahana Valley, Hawaii: A Geomorphic Artifact
- Chester W. Shaw, Jr.; Tree-Ring Based Summer Drought Estimates for the Pinelawn/Reserve and Mimbres Region in New Mexico
- Sandra Olsen; Solifluction as a Major Taphonomic Process at Solutre, France
- Christopher L. Borstel; Neolithic Site Densities in Eastern China: Artifact and Reality
- Arlene Miller Rosen; Neolithic Cereal Exploitation in the Southern Levant: Perspectives from Phytolith Analysis
- Nancy E. Sikes and Stanley H. Ambrose; Soil Carbon Isotope Evidence for Holocene Habitat Change in the Kenya Rift Valley
- Kim Bartolotta; Sediment as Artifact: A Substantive Example from a Norwegian Farm-Mound
- John Allen Peterson, S. Christopher Caran, Raymond W. Neck and Barbara M. Winsborough; Marshes, Ponds, and Paleosols: Holocene Biostratigraphy at Palo Duro in the Southern Plains
- Gil Stein; "Don't Get Around Much Anymore": Effects of Sedentism on Neolithic Animal Economy in the Near East

Leslie Quintero; Modern Gazelle and Goat Cementum as Seasonality Indicators for the Neolithic Levant: A Test at 'Ain Ghazal

- Jonathan Mabry; Prehistoric Water Management in the Jordan River Valley
- Lynn Fisher; Variable Core Reduction Strategies in the Southwest German Magdalenian
- Beverly Mitchum and Eleanor King; Tool Production Strategies at Colha, Belize
- Lee Fratt; The Hornol'ovi III Ground Stone Assemblage: Implications for Resource Exploitation and Aggregation
- Jane Peterson, Kathy Bolen and Kristopher R. Carambelas; Lithic Raw Material Patterns in Southeastern Ireland
- Ronald Towner; Alternate Face Thinning and the Production of "Soft Hammer" Percussion Flakes
- Melinda Leach and Robert G. Elston; Quarrying, Lithic Production and Settlement at Tosawihi Quarries: An Overview of Ongoing Research
- Elaine Sherman and Jeffrey Quilter; An Analysis of Chipped Stone Tools from the Thiel Site: A Lake Winnebago Phase Oneota Habitation
- Jenny Adams; Understanding the Use of Groundstone Tools Through Experimentation
- Linda A. Reynolds; Casa Diablo: The Once and Future Quarry
- Jonathan Bowen; Late Archaic Grooved Axes and Mauls in Northwestern Ohio

[48] Symposium: COLUMBIAN CONSEQUENCES, PART III: BEYOND DISCIPLINARY BIAS: FUTURE DIRECTIONS IN CONTACT PERIOD RESEARCH

Room B

Organizer: David Hurst Thomas  
Organizer and Chairperson: Ann F. Ramenofsky

Participants

- 8:00 Ann F. Ramenofsky; Quincentenary Research in Perspective
- 8:20 Patricia Galloway; Rhetoric and Truth in the Ethnohistory of Early Contact
- 8:40 William R. Swagerty; Protohistoric Trade in Western North America: Archaeological and Ethnohistorical Considerations
- 9:00 Sarah Campbell; How Wide the Ripples?: The Case for Early 16th Century Epidemics in Nonagricultural Western North America
- 9:20 David Stannard; The Consequences of Contact: Towards a Theory of Indigenous Responses to Biological and Cultural Invasion
- 9:40 Henry F. Dobyns; Links Between Demographic and Cultural Changes
- 10:00 Robert C. Dunnell; Methodological Impacts of Catastrophic Depopulation on American Archaeology and Ethnology
- 10:20 Discussant: Marvin Harris

[49] General Session: CONTRIBUTIONS TO NORTHEASTERN ARCHAEOLOGY

Room B

Participants

- 11:00 Eleazer D. Hunt; Patterns of Late Woodland Village Settlement in Southwestern New York State: An Ecological Approach
- 11:20 Kathleen M. Allen; Climatic Variation and Cultural Dynamics in Northeastern North America

[50] Symposium: THE AZTEC CITY-STATE OF OTUMBA: A CASE STUDY IN CITY-STATE POLITICAL AND ECONOMIC EVOLUTION

Room C

Organizers and Chairpersons: Thomas H. Charlton and Deborah L. Nichols

Participants

- 8:00 Thomas H. Charlton; Economics and Politics: The Case of Aztec Otumba
- 8:20 K. Kris Hirst and Marcel Mendoza; Surface Ceramics at Otumba: Implications for Site Size, Chronology, and Organization
- 8:40 Martin Biskowski; Groundstone Tools at Otumba

- 9:00 Deborah L. Nichols; Maguey Fiber Production in the Aztec City-State of Otumba, Mexico  
 9:20 William J. Parry; Specialized Production and Consumption of Obsidian Tools in an Aztec City-State  
 9:40 Cynthia L. Otis Charlton; Figurine and Lapidary Production at Otumba: Craft Specialization in Domestic Contexts  
 10:00 Discussants: Susan T. Evans and Michael E. Smith

**[51] General Session: CONTRIBUTIONS TO MESOAMERICAN ARCHAEOLOGY**

Room C

**Participants**

- 10:40 James A. Neely, S. Christopher Caran and Barbara M. Winsborough; Prehispanic Irrigated Agriculture at Hierve el Agua, Oaxaca, Mexico  
 11:00 George L. Cowgill, Ruben Cabrera C. and Saburo Sugiyama; Early Teotihuacan Rulership: New Evidence from the Feathered Serpent Pyramid  
 11:20 Barbara Ann Hall; Domestic Refuse and Residential Mound Formation in La Mixtequilla, Veracruz, Mexico  
 11:40 Ellen T. Hardy; Mortuary Practices and Social Structure Among Precolumbian Inhabitants of the Bay of Culebra, Costa Rica

**[52] Symposium: WINDOWS ON THE PAST: PUBLIC INVOLVEMENT IN CRM**

Room I

Organizer: Jerry Wylie  
 Chairperson: Evan I. DeBloois

**Participants**

- 8:00 Evan I. DeBloois; Windows on the Past: Public Involvement in Cultural Resources Management  
 8:20 Timothy J. Brady and Jim Keyser; Cultural Heritage Week: Interpreting America's Past  
 8:40 Cort Sims; Partners in Time  
 9:00 Thomas R. Cartledge and Patricia M. Spoerl; Discovering the Past: The Interface Between Linking Research and Public Interpretation  
 9:20 Robert York, Gary Matlock, Allen Kane and E. Polly Hammer; The View from the Rocky Mountains  
 9:40 Jerry Wylie and Stan McDonald; Meeting the Public's Need for Heritage Resource Experiences  
 10:00 BREAK  
 10:10 Denise McLemore; The Mormon-Carson Emigrant Trail  
 10:30 Mark McCallum; Alaska: Where the Past Meets the Future  
 10:50 Kent Schneider and L. W. Braddock; Cost-Share: Treasure Chest or Pandora's Box?  
 11:10 Gordon Peters, Christy Hohman-Caine, Mark Bruhy and Mike Beckes; Passports in Time: Public Archaeology in the Upper Great Lakes

**[53] Symposium: PALEOINDIAN ADAPTATIONS IN SOUTHWESTERN NEBRASKA PHASE I: PREVIOUS RESEARCH, PALEOENVIRONMENTAL DATA, AND THE ALLEN SITE**

Room J

Organizer and Chairperson: Douglas B. Bamforth

**Participants**

- 8:00 E. Mott Davis; Medicine Creek, Nebraska: Introduction to the Symposium  
 8:20 Linda Cummings; Pollen/Phytolith Evidence for the Terminal Pleistocene/Early Holocene Environment of the Medicine Creek Drainage, Southwest Nebraska  
 8:40 L. Anthony Zalucha; Early Holocene Vegetation of the Central Great Plains Based on Charcoal from the Allen Site  
 9:00 David W. May; Geomorphology and Late-Quaternary Stratigraphy of Paleoindian Sites in the Medicine Creek Basin

- 9:20 Steven R. Holen and Robert K. Blasing; Two Late Pleistocene Sites in the Central Plains: Preliminary Statements  
 9:40 Nancy L. Hamblin; Paleoindian Animal Use at the Allen Site (25FT50) in Western Nebraska  
 10:00 Amy Koch; Stone Tools from the Allen Site (23FT50)  
 10:20 Douglas B. Bamforth; The Allen Site in Context  
 10:40 Discussant: Michael A. Jochim

**[54] General Session: PALEOINDIAN STUDIES**

Room J

**Participants**

- 11:00 Daniel S. Amick, Richard O. Rose and Jack L. Hofman; Shifting Sands: A New Folsom-Midland Campsite From The Monahans Dunes of Western Texas  
 11:20 Valentina L. Martinez; "Folsom-Midland" Sites of the Southern High Plains  
 11:30 Ted Goebel and Roger Powers; The Nenana Complex of Alaska and Clovis Origins  
 11:50 Paul R. Takac; "Home Bases" and the Paleoindian/Archaic Transition in Central Texas

**[55] Symposium: LATE QUATERNARY PALEOENVIRONMENTS: PALEOCLIMATIC INTERPRETATIONS AND ARCHAEOLOGICAL IMPLICATIONS**

Room G

Organizers and Chairpersons: James L. Phillips and Ofer Bar-Yosef

**Participants**

- 8:00 Andrew Garrard; Environmental Diversity and Settlement in the Late Quaternary of Jordan  
 8:20 Paul Goldberg; Paleoclimates as Reflected in Sediments from Levantine Cave Sites?  
 8:40 William Farrand, Carola H. Stearns and Ralph S. Solecki; Revision of Chronology of Yabrud Shelter I, Syria  
 9:00 Eitan Tchernov; Paleoclimatic Indicators in the Late Quaternary Fauna of the Levant  
 9:20 Anna Belfer-Cohen and Ofer Bar-Yosef; Coping with Stress: Late Quaternary Archaeology in the Near Eastern Deserts  
 9:40 Bruce G. Gladfelter and James L. Phillips; Geomorphology and the Late Pleistocene Prehistory of Sinai  
 10:00 BREAK  
 10:10 Brian Byrd; Late Pleistocene Variability in the Eastern Jordan Desert  
 10:30 A. Nigel Goring-Morris; Late Pleistocene Settlement Patterns in the Negev and Sinai  
 10:50 Isaac Gilead; Chalcolithic Farmer-Herders in Their Environmental Context in the Northern Negev  
 11:10 Zeev Herzog; Settlement and Climate Change During the Early Bronze and Iron Ages in the Beer-sheba Valley, Israel  
 11:30 Discussants: Lawrence H. Keeley and Fekri Hassan

**[56] Symposium: ABANDONMENT PROCESSES: STRUCTURES AND SITES**

Room 2 & 3

Organizer: Steve A. Tomka  
 Organizer and Chairperson: Catherine M. Cameron

**Participants**

- 8:00 Warren R. DeBoer; Abandoned Homes and Better Gardens: A Case Study from the Tropical Forests of Ecuador  
 8:20 Nan A. Rothschild, Barbara J. Mills, T. J. Ferguson and Susan Dublin; Abandonment in Zuni Farming Villages  
 8:40 Catherine M. Cameron; Structure Abandonment at a Hopi Pueblo  
 9:00 Robert Brooks; Household Abandonment Among Sedentary Plains Societies: Behavioral Sequences and Consequences in Interpretation of the Archaeological Record  
 9:20 Barbara K. Montgomery; Ceramic Analysis as a Tool for Discovering Processes of Pueblo Abandonment

- 9:40 Ricky R. Lightfoot; Processes of Abandonment at the Duckfoot Site  
 10:00 Sarah Schlanger and Richard H. Wilshusen; Local Abandonments and Regional Conditions in the Northern American Southwest  
 10:20 Discussants: Michael B. Schiffer and Richard V.N. Ahlstrom

**[57] General Session: ISSUES IN ETHNOARCHAEOLOGY**

Room 2 & 3

**Participants**

- 11:00 Clifford T. Brown; Problems in the Methodology of Ethnoarchaeology  
 11:20 Ingrid Herbich and Michael Dietler; Settlement Biography: A Diachronic Perspective on Settlement Organization and the Symbolic Dimensions of the Luo Homestead  
 11:40 Jean Hudson; The Effects of Trade and Sharing on Body Part Distribution: An Aka Example

**[58] Symposium: THE ARCHAEOLOGY OF THE CULTURAL LANDSCAPE**

Room F

Organizers and Chairpersons: James C. Garman and J. Edward Hood

**Participants**

- 8:00 J. Edward Hood; Integrating Social Relations and the Built Environment: Cultural Landscape Studies  
 8:20 Randall McGuire and John McNiff; Cerros de Trincheras and the Cultural Landscape of Northern Sonora, Mexico  
 8:40 Michelle Hegmon; Symbolic Shelters: Domestic and Ritual Architecture in the American Southwest  
 9:00 Rita Reinke; Landscape Compositions: Use of the Landscape in Deerfield, Massachusetts  
 X 9:20 Robert Paynter; The Transformations of the W.E.B. DuBois Boyhood Homesite: A Consideration of Race, Class, Gender and Space  
 9:40 Ellen-Rose Savulis; Alternative Visions and Landscapes: Archaeology of the Shaker Social Order and its Built Environment  
 10:00 BREAK  
 10:10 James C. Garman; The Built Environment of Agribusiness: Southern Rhode Island at the Turn of the Century  
 10:30 Patricia Mangan; Material Changes in Montblanc  
 10:50 Mark Bograd; The Changing Interpreted Landscape of Washington's Mount Vernon  
 11:10 Chris Hardaker; Symbolic Washington D.C.  
 11:30 Discussants: Anne Yentsch and John Fritz

**[59] Symposium: SMALL SITES IN THE BIG PICTURE: THE IMPORTANCE OF SMALL SITES IN UNDERSTANDING ORGANIZATION IN THE PREHISTORIC SOUTHWEST**

Room H

Organizer: Linda S. Mick-O'Hara and Kurt Anschuetz  
 Organizer and Chairperson: Timothy D. Maxwell

**Participants**

- 8:00 Linda S. Mick-O'Hara; Gardens and the Hunt: Multiple Use Areas on the Archaeological Landscape  
 8:15 Paul R. Fish and Suzanne K. Fish; Small Sites and the Large Surveys  
 8:30 Steven R. James; Hohokam Faunal Assemblage Variability and Settlement Patterns in the American Southwest  
 8:45 Jonathan C. Driver; Regional Variation in Hunting Strategies, Sierra Blanca, New Mexico  
 9:00 Sigma Larralde and Sarah Schlanger; Anasazi Hunting Strategies as Seen Through Projectile Point Distributions  
 9:15 Raymond Mauldin; Factors Conditioning Variation in Site Area in the American Southwest

- 9:30 Margaret C. Nelson; Changing Land Use Patterns in the Eastern Mimbres Region, Southwestern New Mexico  
 9:45 Robert W. Preucel; Seasonal Circulation and Dual Residence in the Puebloan Southwest  
 10:00 BREAK  
 10:10 Janet Orcutt; Field Houses, Communities, and Land Use on the Pajarito Plateau  
 10:25 James L. Moore; Local Ecology and Southwestern Water Control Systems  
 10:40 Kurt F. Anschuetz; A View From a Field: Short-Term Agriculture Risk and Long-Term Social Dynamics in the Northern Rio Grande  
 10:55 Timothy D. Maxwell; Agriculture Sites in an Evolutionary Context  
 11:05 Discussants: Linda S. Cordell and Richard I. Ford

**[60] Symposium: ARCHAEOLOGICAL IMPLICATIONS OF MODERN REFUSE STUDIES**

Room A

Organizer and Chairperson: Douglas C. Wilson

**Participants**

- X 8:00 William L. Rathje; The Garbage Project at 15  
 8:20 Wilson W. Hughes; Archaeological Techniques and Modern Refuse Analysis  
 8:40 Gavin H. Archer; Data Bias Resulting From Screening of Archaeological Matrix  
 9:00 Masakazu Tani and Gavin H. Archer; Dating Garbage: The Accuracy and the Utility of Bottle Marks to Date Secondary Refuse Deposits  
 9:20 Gerardo Bernache; Ethnicity and Literacy: An Archaeological Approach  
 9:40 Susan Dobyns; How and Why do Household Characteristics Influence Patterns of Food Use and Disposal  
 10:00 Douglas C. Wilson; Discard Distributions and the Measurement of Human Behavior  
 10:20 Timmy W. Jones; The Question of Meaning in Archaeology: Processual or Post-Processual  
 10:40 Discussants: James J.F. Deetz and Brian D. Hayden

**SATURDAY AFTERNOON APRIL 21, 1990s**

**[61] Poster Session: GREAT BASIN ARCHAEOLOGY, ANALYTICAL ARCHAEOLOGY**

Room D

**Participants**

- Charles Reher; Time and Tempo: Cultural Dynamics on the Prehistoric High Plains  
 Alan McPherron; Bypassing Color IR Film by Close-Range Imaging and Processing in the Field  
 James J. Hester; Problems in the Adoption of High Technology in Archaeology  
 James Grady; Non-Destructive Archaeology: The View From Above  
 Kenneth L. Kvamme; Archaeology and GIS in the 21st Century  
 Helen Perlstein Pollard; The Political and Economic Implications of Obsidian Trade within the Tarascan State  
 Cynthia Pinto; Preliminary Research of the Material Culture of the Winnemucca Lake Cave Sites in Pershing County, Nevada  
 C. Cliff Creger; A Study of Prehistoric Resource Use at Duck Valley, Nevada  
 Steven Simms and Rose Milovich; I See Their Dump, but Where's the Town? The Structure of the Bustos Wickiup Site  
 Robert Michael Yohe; A Reassessment of Culture History in the Western Great Basin: Data from a New Suite of Radiocarbon Dates from the Rose Spring Site (Ca-Iny-372)  
 Sloan R. Williams, Jonathan L. Longmire and Lane A. Beck; Human DNA Recovery from Ancient Bone  
 Todd L. Howell; Assessing the Effectiveness of Auger Testing as a Predictor of Subsurface Artifact Density  
 Michael Marchbanks; Organic Residue Analysis: Implications for the Interpretation of Form and Function

## Saturday Afternoon, April 21

- Richard W. Stoops, Jr.; Determining the Effects of Human Trampling on the Lateral Movement of Surface Artifacts  
 Fran H. Whittaker; Relative Dating of Surface Materials Using the Fluorine Content of Bone  
 Martha Boden; Error Probabilities in Hypothesis Testing: A Discussion of Power  
 Harold Hietala and Frank Winchell; Archaeological Diversity: A Closed Form Solution for Calculating the Rarefaction Curve  
 Marilyn R. Orr, Myra Giesen, Paul W. Sciulli and Kelleen R. Butterworth; Stature Variation Among American Civil War Soldiers  
 Michael W. Diehl; A Cross-Cultural Examination of the Relationship Between Architecture and Mobility  
 Lynne P. Sullivan, Lisa M. Anderson and Edward V. Curtin; Access to the Past: The New York State Museum's Archaeological Collections Management Project

## [62] Symposium: INTERACTION SPHERES IN THE CARIBBEAN

Room B

Organizer and Chairperson: William F. Keegan

## Participants

- 1:00 Bruce K. Nodine; Aceramic Populations in the Lesser Antilles: Evidence from Antigua, West Indies  
 1:20 Annie Cody; Specialization, Interaction, and Exchange: A Perspective from the Saladoid Site of Pearls, Grenada, W.I.  
 1:40 Jay Haviser; Geographic, Economic and Demographic Aspects of Amerindian Interaction Between Anguilla and St. Martin-St. Maarten  
 2:00 Louis Allaire; Prehistoric Taino Interaction with the Lesser Antilles: The View from Martinique, F.W.I.  
 2:20 William F. Keegan; Interaction and the Development of Social Complexity in the Northern Caribbean  
 2:40 Samuel M. Wilson; Dangerous Waters: Contact Period Interaction Spheres in the Leeward Islands  
 3:00 Stephen D. Glazier; Strong and Weak Interaction Spheres in the Caribbean  
 3:20 Discussant: John Terrell

## [63] General Session: PALEO-DIET ANALYSIS

Room B

## Participants

- 3:45 James H. Burton; Barium as a Paleodietary Indicator  
 4:05 C. Britt Bousman and Michael Quigg; Stable Carbon Isotopes and Human Diet in Trans-Pecos Texas  
 4:25 Heidi Lippmeier; An Assessment and Comparison of Nutritional Status Between the Mimbres and Black Mountain Populations of Southwestern New Mexico  
 4:45 James Garber and David Glassman; The Human Osteological Remains from Ambergris Cay, Belize: Social Status and Differential Access to Resources

## [64] Symposium: IMAGE AND INFORMATION IN THE AZTEC WORLD

Room A

Organizers and Chairpersons: Mary G. Hodge and Elizabeth H. Boone

## Participants

- 1:00 Elizabeth H. Boone; Civic Self-Definition in the Aztec World  
 1:20 Mary G. Hodge; Big-City Style and Rural Life: Standardization and Regional Variation in Aztec Decorated Serving Dishes  
 1:40 Elizabeth S. Brumfiel, David Schafer and Tamara Salcedo; The Lip Plugs of Xaltocan: Symbols in Action and Symbols in Practice  
 2:00 Susan T. Evans; Household Ritual in Aztec Life

## Saturday Afternoon, April 21

- 2:20 Michael E. Smith; Material Expressions of Wealth and Status at Late Postclassic Sites in Morelos, Mexico  
 2:40 Richard Townsend; The Sacred Precincts of Mount Tlaloc  
 3:00 BREAK  
 3:10 Anthony Aveni; Concepts of Spatial and Temporal Order in the Conflict of the Tlaloc Debt Payment Ritual in the Month of Aticahualo  
 3:30 Doris Heyden; Wood in Life and Death  
 3:50 David Carrasco; Give Me Some Skin! The Image and Redistribution of the Aztec Warrior  
 4:10 Discussants: Cecelia F. Klein and Barbara L. Stark

## [65] General Session: ISSUES IN ARCHAEOLOGICAL THEORY

Room I

## Participants

- 1:00 Heidi E. Reed and Timothy D. Maxwell; Darwinian Evolutionary Theory for Archaeology: Some Considerations  
 1:20 Joseph A. Tainter; Unraveling the Origins of Inequality  
 1:40 Thomas Fletcher and Vincent Schiavitti; Towards a Social Theory of Material Culture

## [66] Symposium: CRM DATABASES: ORGANIZATIONAL, TECHNICAL AND ETHICAL ISSUES FOR THE 1990S

Room I

Organizer and Chairperson: Roger H. Leech

## Participants

- 2:10 W. Fredrick Limp, James Farley, Jami Lockhart, Ishmael Williams and Sandra Parker; Archaeological Databases at the Continental and State Scale  
 2:30 Veletta Canouts; The National Archaeological Database: "Punctuated Equilibrium"  
 2:50 Craig Davis; Issues in Designing an Archaeological Resource Management Database for National Parks  
 3:10 James Henderson; CRM Databases in the Canadian Parks Service  
 3:30 Roger H. Leech; The National Archaeological Record for England: Strategies for the Supply of Archaeological Information  
 3:50 Bill Startin; English Heritage Records for Cultural Resource Management  
 4:10 Ronald L. Bishop; Smithsonian Archaeometric Research Collections and Records (SARCAR); From Concept to Tool  
 4:30 Jeanne Marty; Documentation of Archaeological Material at the Getty Center  
 4:50 Christopher S. Peebles; Database Management Systems: The Emphasis Should Be on the Middle Term

## [67] General Session: PLEISTOCENE ZOOARCHAEOLOGY

Room J

## Participants

- 1:00 John Hoffecker; Mousterian Adaptations on the South Russian Plain  
 1:20 Philip G. Chase; Mousterian Behavior, Taphonomy, and the "Bone Bed" of La Quina, Southwestern France  
 1:40 Kathryn Cruz-Uribe; The Taphonomy of the Middle Pleistocene Site of Elandsfontein, Cape Province, South Africa

## [68] Symposium: THE IRVINE COAST ARCHAEOLOGICAL PROJECT: ARCHAEOOMETRY AND CULTURAL RESOURCE MANAGEMENT IN SOUTHERN CALIFORNIA

Room J

Organizers: Roger D. Mason and Jonathon E. Ericson  
 Chairperson: Michael E. Macko

## Participants

- 2:00 Michael E. Macko and Roger D. Mason; The Irvine Coast Archaeological Project: Managing the Incorporation of Scientific Applications in Southern California CRM

## Saturday Afternoon, April 21

- 2:20 Keith B. MacDonald and Michael E. Macko; Some Paleoecological Implications of the Recent History of Newport Bay and the Orange County Coastal Plain  
 2:40 Linda Scott Cummings and Lisa Panet Klug; Archaeobotanical Analysis of Prehistoric Sites on the Irvine Coast  
 3:00 Mark L. Peterson, Jonathon E. Ericson and Gary S. Hurd; Geophysical Survey of Prehistoric Sites on the Irvine Coast  
 3:20 Christine Prior and Jonathon E. Ericson; Ocean Upwelling Effects, Faunal Changes, Site Soil Formation Rates and Settlement Patterns by Radiocarbon Dating and Carbon Isometry  
 3:40 Stan Cisowski and Jonathon E. Ericson; A Test of Contemporaneity of Features and Sites Within the Irvine Coast By Archaeomagnetic Dating  
 4:00 Michael Takaesu and Jonathon E. Ericson; Season of Death of Shellfish Determines Feature Contemporaneity and Marine Paleotemperatures by Oxygen Isometry  
 4:20 Gary S. Hurd and Michael E. Macko; Rocks, Bones, Bits, and Megabytes: The Irvine Coast Database  
 4:40 Roger D. Mason and Michael E. Macko; Archaeometry and Archaeological Interpretation in the Irvine Coast Archaeological Project

## [69] General Session: ORIGINS, INTERACTIONS AND TRANSITIONS IN THE EASTERN WOODLANDS

## Room G

## Participants

- 1:00 Tristram R. Kidder; The Timing and Consequences of the Introduction of Maize: Agriculture in the Lower Mississippi Valley  
 1:20 Janet Rafferty; From Spear to Bow: Using Seriation to Establish the Structure of Technological Change in Northeast Mississippi  
 1:40 Robert Riordan; A Construction Sequence for a Hopewell Hilltop Enclosure  
 2:00 C. Wesley Cowan; Social Implications of Ohio Hopewell Art  
 2:20 Lauren M. Michals; Faunal Exploitation and Chiefdom Organization at Moundville, Alabama  
 2:40 James L. Rudolph and Teresa P. Rudolph; The Function of Woodland Platform Mounds: the View from the Leake Site  
 3:00 BREAK  
 3:10 Brian G. Redmond; Emergent Mississippian Settlement and Subsistence Adaptations in the Lower Ohio Valley  
 3:30 William Green; Patterns and Processes of Early Mississippian Inter-societal Contacts within the Cahokia Interaction Network  
 3:50 Douglas K. Charles; Social Factors in the Middle to Late Woodland Transition in Westcentral Illinois  
 4:10 Fred A. Finney; Late Woodland and Middle Mississippian Culture Contact at the Fred Edwards Site in the Upper Mississippi River Valley: The Household Evidence  
 4:30 Jacqueline Ferguson and Robert E. Warren; Archaic Strategies of Settlement and Chert Procurement in the Eastern Prairie Peninsula  
 4:50 Jeffrey Hantman, Sandra Olsen and Gary Dunham; Ritual Processes in the Virginia Accretional Mounds

## [70] Symposium: CRAFT SPECIALIZATION IN COMPLEX SOCIETIES: EVIDENCE FROM ANALYSES OF STONE TOOLS

## Room 2 &amp; 3

Organizer and Chairperson: April K. Sievert

## Participants

- 1:00 Susan Wurtzburg; Sayil (Yucatan Mexico) Lithics: Implications for Urban Economic Organization  
 1:20 Suzanne Lewenstein; The Lithic Tool Kit of the Mayan Mason: Functional and Ethnoarchaeological Considerations  
 1:40 Mark Aldenderfer; Late Classic Lowland Maya Carpentry and Lapidary Craft Specialties: The Functional Evidence

## Saturday Afternoon, April 21

- 2:00 Guadalupe Miranda Sanchez; Lithic Analysis and Activities at Tepetitlan: A Rural Habitation Area Within the Toltec State  
 2:20 Richard W. Yerkes; Microdrills and Shell Bead Production in Mississippian Societies  
 2:40 April K. Sievert; Investigating Categories of Production Using Lithic Data: A Case from the Maya Postclassic Period  
 3:00 BREAK  
 3:10 John Dockall and Harry J. Shafer; Functional Variability and Stone Tool Consumption: An Ancient Maya Case from Santa Rita Corozal, Belize  
 3:30 Lawrence H. Keeley and Daniel Cahen; An Example of Village Specialization in the Early Neolithic of NW Europe  
 3:40 Patricia Anderson-Geraud; Examples of Tools Showing Craft Specialization Activities in the Harrappan of Pakistan and the Neolithic of Turkey  
 X 4:10 Maurizio Tosi; Sectorial Growth and Craft Specialization: Two Perspectives to Interpret Social Evolution from the Archaeological Evidence  
 4:30 Discussants: Brian D. Hayden and Thomas R. Hester

## [71] Symposium: THINKING ABOUT EATING

## Room F

Organizer: Christine A. Hastorf  
Organizer and Chairperson: Sissel Johannessen

## Participants

- 1:00 M.J. Weismantel; Jayaj and Mishqui: Indigenous Food Categories and the Dialectics of Gender in the Northern Andes  
 1:20 Julian Thomas; The Changing Meanings of Food in Neolithic Britain  
 1:40 Sissel Johannessen; Food as Metaphor in the Food-Systems of Three Mississippian Cultures  
 2:00 Lisa Lecount and Melissa Hagstrum; Cuisine, Cooking and Cookware: Toward Reconstructing Food-Related Activities in the Archaeological Record  
 2:20 Christine A. Hastorf; Changing Menus-Cultural Implications of Archaeobotanical Remains  
 2:40 Sigrid Arnott; Meat, Gender, and Power  
 3:00 Jerry Moore; More Than Just a Meal: Social Implications of Prehistoric Dietary Patterns on the North Coast of Peru  
 3:20 Scott O'Mack; Montezuma's Dinner Reconsidered  
 3:40 Discussants: George Armelagos and Evon Vogt

## [72] General Session: PLAINS ARCHAEOLOGY

## Room F

## Participants

- 4:15 LuAnn Wandsnider; Past Not-Kung and Not-Nunamiut Behavior in Southwestern Wyoming  
 4:35 Michael S. Sheehan; Aquifers and Plains Early Archaic Adaptation to the Altithermal  
 4:55 Christian J. Zier and Stephen M. Kalasz; Recon John Shelter and the Archaic-Woodland Transition in Eastern Colorado  
 5:05 Marcel Kornfeld and Mary Lou Larson; Archaic Period Occupation of the Central High Plains: The Hutton-Pinkham Site, Colorado

## [73] Symposium: BEYOND THE BLACK SAND: SEVENTY-FIVE YEARS OF ARCHAEOLOGY IN THE FLAGSTAFF AREA

## Room H

Organizers and Chairpersons: Kathryn Kamp and Christian E. Downum

## Participants

- 1:00 Christian E. Downum; Clans, Cinders, Culture, and Climate: A Review of Explanation in Flagstaff Archaeology  
 1:20 Linda T. Grimm; Archaic Period Occupation of the Southwestern Colorado Plateau

## Sunday Morning, April 22

- 1:40 Terry Samples, David R. Wilcox and John Hanson; Cohonina Archaeology: Past and Present  
 2:00 Richard V.N. Ahlstrom; Reassessing Tree-Ring Evidence in the Flagstaff Area  
 2:20 J. Michael Bremer; Flagstaff Area Pithouse Architectural Variability and Determinants of Cultural and Temporal Affiliation  
 2:40 Timothy Burchett; Architecture and Social Organization at Wupatki Pueblo  
 3:00 BREAK  
 3:10 Kathryn Kamp and John Whittaker; View from the Trenches: The Dirt about Sinagua Social Organization  
 3:30 Peter J. Pilles, Jr.; Sites, Sites, and More Sites: Thoughts on Sinagua Settlement and Social Organization, 1916-1990  
 3:50 Amy Douglass; Theoretical Frameworks and Their Influence on the Study of Ceramic Exchange: A Flagstaff Example  
 4:10 Discussants: Jeffrey S. Dean and David A. Breternitz

[74] Symposium: ALTERNATIVE LIVELIHOODS: INVESTIGATING PREHISTORIC SUBSISTENCE CHANGE

Room C  
 Organizer: Dale R. Croes  
 Organizer and Chairperson: Rebecca A. Hawkins

Participants

- 1:00 Dale R. Croes and Steven Hackenberger; Modeling the Evolution of Northwest Coast Economic Decision-Making: A 9,000-Year Computer Simulation  
 1:20 Jon Erlandson;  
 1:40 Alan P. Sullivan, III; A Reexamination of Anasazi Subsistence Change  
 2:00 R.G. Matson; Dietary Change in the Upland Southwest: The Coming of Agriculture  
 2:20 James M. Bayman and Suzanne K. Fish; Locational Shifts in Sonoran Desert Subsistence  
 2:40 Clark L. Erickson; Prehistoric Agricultural Intensification: A Perspective from the Andean Highlands  
 3:00 BREAK  
 3:10 Robert F. Scott, IV and Fred Valdez; Subsistence and Culture Change in the Terminal Classic to Early Postclassic Maya Lowlands: The Colba Case  
 3:30 Rebecca A. Hawkins; Do They Really Hold Water? Models for the Appearance of Pottery in the Eastern Woodlands  
 3:50 Kenneth B. Tankersley; Bison and Subsistence Change During the Late Prehistoric of the Ohio Valley

## SUNDAY MORNING APRIL 22, 1990

[75] Symposium: REEVALUATING SOCIAL AND ADAPTIVE DEVELOPMENTS IN THE NORTHERN CADDOAN ARCHAEOLOGICAL REGION

Room B  
 Organizers and Chairpersons: Gayle J. Fritz and J. Daniel Rogers

Participants

- 8:00 Gayle J. Fritz; Agricultural Patterns in the Northern Caddoan Archaeological Region  
 8:20 Lois E. Albert; The Lee Creek Watershed, Oklahoma: Its Role in the Study of Social and Economic Changes During the Woodland and Caddoan Periods  
 8:40 Charles L. Rohrbaugh; Population and Cultural Dynamics in the Arkansas River Region of the Caddoan Area  
 9:00 James A. Brown; More Mystery from the Spiro Site  
 9:20 Marvin Kay; A Regional Assessment of Huntsville Mounds in the Western Ozark Highland  
 9:40 Burton L. Purrington and David W. Benn; Core and Peripheral Societies in the Northern Caddoan Area: Evidence from the Missouri Ozarks

## Sunday Morning, April 22

- 10:00 BREAK  
 10:10 Ann Early; Look to the Southern Hills: Late Prehistoric Relationships between the Arkansas River Valley and Ouachita Mountains of Arkansas  
 10:30 Barbara A. Burnett; The Biological Correlates of Cultural Adaptation in the Arkansas River Basin  
 10:50 James E. Barnes and Jerome C. Rose; Dental Variation, Populations, and Genetics Among the Prehistoric Caddo  
 11:10 Frank F. Schambach; The "Northern Caddoan Area" was not Caddoan  
 11:30 Discussants: Michael P. Hoffman and Timothy K. Perttu

[76] General Session: CONTRIBUTIONS TO PERUVIAN ARCHAEOLOGY

Room C

Participants

- 8:00 Izumi Shimada, Crystal B. Schaaf, Lonnie Thompson and Ellen Mosley-Thompson; Cultural Impacts of Severe Droughts in the Andes: Application of 1500-year Precipitation Record from Ice Cores  
 8:20 Yae Koda; Wooden Farming Implements From the South Coast of Peru

[77] Symposium: RECENT FIELD RESEARCH ON THE PERUVIAN MIDDLE HORIZON

Room C

Organizer and Chairperson: Gordon McEwan

Participants

- 9:00 Gordon McEwan; The Pikillacta Archaeological Project: Investigations at a Major Wari Provincial Center  
 9:20 Nicole Couture; Type F: A New Structural Type at the Wari Site of Pikillacta  
 9:40 Alana Cordy-Collins and Ann Hutfles; Wari Ritual Space at Pikillacta, Peru  
 10:00 Daniel G. Julien and Mary Owens; Midden Excavations at Pikillacta, Peru, 1989  
 10:20 John Verano; Human Skeletal Remains from Pikillacta  
 10:40 Margaret M. Sciscento; Wari Hegemony in the Chuquibamba Valley, Peru  
 11:00 Katharina J. Schreiber; The Wari Occupation of the Nasca Valley: A Preliminary Assessment  
 11:20 Anita Gwynn Cook; The Middle Horizon Occupation of the Ica Valley, Peru  
 11:40 Helaine Silverman and David Browne; Nasca and Wari Sociopolitical Dynamics and Settlement Patterns in the Northern Valleys of the Rio Grande de Nazca Drainage, South Coastal Peru

[78] Symposium: RESEARCH DESIGNS IN THE SECTION 106 PROCESS

Room I

Organizers: Alan Stanfill and Timothy K. Perttu  
 Chairperson: Claudia Nissley

Participants

- 8:00 Timothy K. Perttu; Problems in Research Design: The Advisory Council's Western Office of Project Review Perspective  
 8:20 Alan Stanfill; The Logistics of Preparing Research Designs  
 8:40 Alan D. Reed; Research Designs from a Contractor's Perspective  
 9:00 Mark E. Basgall; Suffering the Fool: Observations on Research Designs and Contract Archaeology  
 9:20 Ben Phillips and William R. Killam; Balancing CRM and Research: Approaches and the Role of the Reviewer  
 9:40 Robert J. Jackson; The Role of Research Designs in Cultural Resource Management Archaeology  
 10:00 BREAK  
 10:10 Alice M. Baldrige; The Use of Research Designs in Nevada  
 10:30 John D. Schelberg; Research Designs: Tools for Evaluation But Do They Promote Science?

## Sunday Morning, April 22

- 10:50 Ann M. Johnson; Research Designs and Section 106: The View from Denver  
 11:10 Discussant: W. Fredrick Limp

[79] Symposium: SAMPLING, TIME, SPACE, AND POPULATION ALONG THE MIDDLE SAN JUAN RIVER

Room J  
 Organizers and Chairpersons: Douglas D. Dykeman and Timothy M. Kearn

**Participants**

- 8:00 Meade F. Kemrer; An Appraisal of Seismic Surveys as Systematic Samples: The Chuska Energy Seismic Project  
 8:20 Timothy M. Kearn; Aceramic Sites and Archaic Occupation Along the Middle San Juan River  
 8:40 Paul F. Reed; Changing Patterns of Anasazi Settlement in the Middle San Juan from Basketmaker III to Pueblo III  
 9:00 Jeffrey Wollin and Timothy M. Kearn; Variability in Navajo Settlement and Site Type in the Middle San Juan River Watershed  
 9:20 Jeffery T. Wharton; Noland's Four Corners Store  
 9:40 Kristin Langenfeld and Douglas D. Dykeman; A Survey of Prehistoric Lithic Resource Procurement Areas Along the Middle San Juan River in Southeast Utah  
 10:00 Discussants: Alan H. Simmons and William D. Lipe

[80] General Session: STUDIES IN SOUTHWESTERN ARCHAEOLOGY

Room J

**Participants**

- 10:40 James M. Adovasio and R.L. Andrews; The Horse Rock Ruin (42SA13182) Basketry Cache: An Unparalleled View of Regional Pueblo Perishable Technology  
 11:00 Stephen H. Lekson; Mimbres Multi-Compency  
 11:20 Thomas M. Morales; Evidence for Ceramic Production at Tonque Pueblo  
 11:30 Lisa Shifrin; Functional Analysis of Ceramic Vessels from a Ninth Century Pueblo Site in SW Colorado  
 11:40 Darrell Creel; The 1989 Excavations at the Old Town Ruin, Luna County, New Mexico  
 11:50 Daniel O. Larson and Joel Michaelsen; Climatic Variability and Population Growth Among the Virgin Branch Anasazi

[81] Symposium: THE ZAGROS PALEOLITHIC: NEW PERSPECTIVES ON ANCIENT HUMANS IN THE MIDDLE EAST

Room G

Organizer and Chairperson: Deborah I. Olszewski

**Participants**

- 8:00 Angela Minzoni-Deroche; Relationships between the Zagros and the Taurus in the Middle Paleolithic  
 8:20 Paul Callow; The Archaeology of the Marginal: The Zagros Paleolithic  
 8:40 Robert H. Bewley; Excavations in the Zagros Mountains: Houmian, a Mousterian Rock-Shelter  
 9:00 John D. Speth and Mark F. Baumler; A Middle Paleolithic Assemblage from Kunji Cave, Iran  
 9:20 Philip E.L. Smith; Ghar-i-Khar and Some Nearby Sites in Iran  
 9:40 Ralph S. Solecki and Rose Solecki; The Pointed Artifacts in the Mousterian Assemblage [Layer D] from Shanidar Cave  
 10:00 BREAK  
 10:10 Harold L. Dibble and Simon J. Holdaway; An Analysis of the Mousterian Lithics from the Site of Warwasi Rockshelter, Iran  
 10:30 Deborah I. Olszewski; New Light on the Zagros Upper Paleolithic: The Baradostian from Warwasi Rockshelter, Iran  
 10:50 Michael Rosenberg; Paleolithic versus Epi-Paleolithic Settlement in the Marv Dasht, Iran

## Sunday Morning, April 22

- 11:10 Discussants: Anthony E. Marks and Gary O. Rollefson

[82] Symposium: ABANDONMENT PROCESSES: SEASONAL VARIATION AND REGIONAL MOBILITY

Room 2 & 3

Organizer: Catherine M. Cameron  
 Organizer and Chairperson: Steve A. Tomka

**Participants**

- 8:00 John W. Fisher, Jr.; Campsite Abandonment Among Efe Pygmies, Zaire  
 8:20 Susan Kent; The Proxemics of Abandonment Behavior Among Kalahari Hunter-Gatherers  
 8:40 Martha Graham; Periodically Abandoned Residence Among the Tarahumara: Settlement Organization and Assemblage Variability  
 9:00 Steve A. Tomka; Site Abandonment Behavior Among Transhumant Agro-Pastoralists: Implications for the Reconstruction of Site Use and Function  
 9:20 Glenn Davis Stone; Cultural and Ecological Determinants of Farmsite Abandonment  
 9:40 Lee Horne; Locational and Occupational Instability in Arid Land Settlement  
 10:00 James G. Ellison and Steven A. Brandt;  
 10:20 Discussants: Marc G. Stevenson and Paul R. Fish

[83] General Session: EXPERIMENTAL ANALYSIS OF EXCAVATION TECHNIQUES

Room 2 & 3

**Participants**

- 11:00 Gerald Schroedl; Experimental Studies in Pit-Feature Deterioration  
 11:20 Henry McKelway and Todd A. Koetje; Which Layer is This? Spatial Analysis and Episodic Pit-filling Experiments at the "Sewage Run" Site  
 11:40 Todd A. Koetje; A Simulation Approach to Recovering Archaeologically Meaningful Levels

[84] Symposium: PREHISTORIC HAWAIIAN FOOD PRODUCTION: REGIONAL DIVERSITY

Room F

Organizers and Chairpersons: Michael W. Graves and Thegn N. Ladefoged

**Participants**

- 8:00 Michael W. Graves; Food Production in an Arid Context: Farming on Lanai  
 8:20 Marshall Weisler; Non-Irrigated Agriculture in the Hawaiian Islands: Results from an Island-Wide Synthesis  
 8:40 Nathaniel Pak, Christopher L. Turner, L.J. Moana Lee and W. Bruce Massee; Gardens of Stone: Prehistoric Agricultural Intensification in Nanakuli Valley, Leeward Oahu Island, Hawai'i  
 9:00 Thegn N. Ladefoged; American Green Grows Bigger Potatoes: Hawaiian Agricultural Intensification and the World Economy  
 9:20 Jeffrey Clark; Settlement and Subsistence in Leeward Hawaii Island  
 9:40 Terry L. Hunt; Variation in Agricultural Production and Evolution of Socio-political Complexity in the Hawaiian Islands  
 10:00 Jane Allen; Agriculture in Windward O'ahu: Its Role in the Evolution of the Hawaiian State System of Government  
 10:20 Mary F. Riford; Hawaiian Fishponds: Showcases of Resource Wealth  
 10:40 Discussant: Patrick Kirch

[85] General Session: STUDIES IN ARCTIC ARCHAEOLOGY

Room F

**Participants**

- 11:10 L. Lewis Johnson; Projectile Point Variation in the Aleutian Islands: Questions of Time and Space

- 11:30 Patricia L. McClenahan and Douglas E. Gibson; Rethinking Subsistence-Settlement Systems of the Northern Maritime Tradition People in the Cape Krusenstern Region, Alaska  
 11:50 Peter H. McCartney; Selectivity and Hunter-Gatherer Resource Exploitation

**[86] Symposium: HUNTER/GATHERER LACUSTRINE ADAPTATIONS**

Room H

Organizers and Chairpersons: Steven A. Brandt and William A. Lovis

**Participants**

- 8:00 Leslie L. Hartzell; Late Period Intensification and the Role of Lacustrine Resources in the Southern San Joaquin Valley, California  
 8:20 William A. Lovis; The Potential Impacts of Environmental Periodicity on Late Archaic Lacustrine Adaptation in the Saginaw Valley of Michigan  
 8:40 Robert Kelly; The Archaeology of Great Basin Wetlands: Subsistence, Sedentism, and Storage  
 9:00 Kathryn Stewart; Fishing Adaptations and Environmental Change at Holocene Lake Turkana Sites  
 9:20 Lawrence J. Jackson; Paleoindian Lacustrine Adaptation and Evidential Criteria: A Case Study from Southern Ontario, Canada  
 9:40 Steven A. Brandt; Across the Great Divide: Late Quaternary Hunter/Gatherer Adaptations in the Afar Rift of Ethiopia  
 10:00 BREAK  
 10:10 Michael A. Jochim; Lakeside Adaptations in the South German Mesolithic  
 10:30 Alison S. Brooks and John E. Yellen; Later Pleistocene Fishing Economies of Central Africa  
 10:50 Michel Egloff; Upper Paleolithic Adaptations at Lake Neuchatel, Switzerland  
 11:10 Fred Wendorf, Angela E. Close and Romuald Schild; Middle Paleolithic Occupations Near Bir Sahara and Bir Tarfawi, Egyptian Western Desert  
 11:30 Ofer Bar-Yosef; Prehistoric Lacustrine Adaptations in the Near Eastern Levant  
 11:50 Discussants: William H. Marquardt and A. C. Roosevelt

**ABSTRACTS OF SYMPOSIA**

**[01] COLUMBIAN CONSEQUENCES, PART I: THE NATIVE CONTEXT OF EARLY COLONIALISM IN SOUTHERN MESOAMERICA AND CENTRAL AMERICA**

These papers emphasize the nature of Indian responses to Spanish colonialism during the sixteenth and seventeenth centuries in the Maya region and Central America. The authors recognize the impact of such colonial phenomena as military conquest, epidemic disease, missionary activity, forced tribute and labor, and resettlement practices as powerful instruments of external social and cultural transformation. Beyond this, however, they emphasize that in responding to these forces of change native societies creatively reconstructed and adapted preconquest cultural strategies in order to survive as "Indians" in the new colonial order.

**[03] DOLLARS AND SENSE OF FEDERAL ARCHAEOLOGY PROGRAMS**

Representatives of the National Park Service, the Corps of Engineers, the Bureau of Land Management, and the Forest Service will analyze their current archaeology programs, emphasizing compliance archaeology. Data will include total agency costs for archaeology, how costs are distributed (e. g., to agency salaries, travel, etc.; to contracts for fieldwork and other services). Representatives of institutions and private firms engaged in contract archaeology will evaluate the federal agencies' programs from the contractor's perspective. All participants will assess the effectiveness of the agency programs and will identify major problem areas. Discussants will critique the presentations and give summary overviews.

**[07] CURRENT RESEARCH IN WESTERN LAKES AND MARSHES**

This session integrates recent studies of biogeographical and archaeological issues relating to changing conditions in and around wetlands of the West. Archaeological sequences from terminal Pleistocene through late Holocene times indicate changes in foraging practices, group composition and mobility, and these are thought to be linked to both broad scale environmental changes as well as to local histories of landscape, biotic and hydrologic conditions.

**[08] THE ROCKY MARRIAGE BETWEEN ARCHAEOLOGICAL RESEARCH AND CRM**

A perennial problem in modern archaeology is the melding of legitimate research domains with pressing management demands and constraints. The Navajo "New Lands" project, involving surveys and excavation in a 149,739 ha addition to the Navajo reservation in NE Arizona, exemplifies the issue: the client places continually changing management constraints on the archaeology, yet is willing to fund a comprehensive research program for the region. Papers present research strategies which maximize research aims within the arbitrary limitations of management. Discussants explore the current state of the art in CRM research generally.

**[09] NEW PERSPECTIVES ON EARLY CERAMICS AND FORMATIVE CULTURE IN THE AMERICAS**

This session brings together scholars investigating the earliest ceramic-producing cultures in northwestern South America, Central America, and southern Mexico to interpret new data on the emergence of ceramic technology. It is clear that pottery came into use at different times in a variety of cultural and ecological settings. The papers will examine the social and adaptational contexts for early ceramics, and compare patterns for changes and continuities in social and technological systems which accompanied the introduction of this new technology.

**[13] SAVE THE PAST FOR THE FUTURE**

One of the major challenges facing the profession today is the preservation of our archaeological data base. Without this data base, we will all become "armchair archaeologists." Meeting this challenge includes a variety of elements such as public education and law enforcement. Perhaps most importantly, it includes education of the profession itself and future generations of archaeologists concerning their own responsibility to address this problem. This symposium will discuss and present the results of the Society's Save the Past for the Future Project, an important step in this process, and will suggest ways that we can help meet the challenge.

**[14] SEASONAL USE OF SITES BY AGRICULTURALISTS**

With the recognition that a wide variety of adaptive strategies were used by prehistoric agricultural populations of the American Southwest, archaeologists have begun to examine sites that were seasonally used by farmers to gain insights into these strategies. Sites with seasonal occupations can result from a variety of factors: residential mobility patterns, specialized procurement trips, or farming activities. For example, pithouse villages and fieldhouses are sites that have been argued to be

## [15] Recent Research in the Largo

seasonally occupied but reflect very different adaptive strategies. This symposium will examine how seasonally used sites can provide critical information about various strategies used by prehistoric southwestern farmers.

### [15] RECENT RESEARCH IN THE LARGO-GALLINA REGION OF NORTH-CENTRAL NEW MEXICO

The Largo-Gallina culture of north-central New Mexico represents a potentially unique high-altitude adaptation that occurred between A.D. 1000–1300. Situated in a context peripheral to the well-known Chaco and Mesa Verde regions, hundreds of Pueblo II and Pueblo III sites in the 3600-square-mile area remain remote today. Recent research has focused on a variety of descriptive, organizational, and community-level studies. This symposium examines various facets of the Largo-Gallina phenomenon. Papers include discussions of historic context, ceramics, architectural forms, site location studies, communication networks, social organization, and future research strategies.

### [16] CELTIC CHIEFDOM—CELTIC STATE

This symposium examines models for the structures of prehistoric and early historic European Celtic polities, drawing upon archaeo-geographical data, Celtic literature and laws, material culture, and theory from the humanities and social sciences. An examination of Celtic societies at different levels of organizational complexity, from several different disciplinary perspectives should lead to the exploration of more general questions concerning the character of early European states and chiefdoms. Such questions include the nature of the transition of chiefdom to state organization in Europe, and the viability and applicability of cross-cultural models of social evolution.

### [17] ANASAZI REGIONAL ORGANIZATION AND THE CHACO SYSTEM

Continuing studies of the structure and distribution of Anasazi communities in the northern Southwest have produced new insights regarding the evolution of the Chaco cultural expression. Significant recent contributions include further delineation of regional settlement patterns and the associated road networks. Attention is directed towards the roles of geography, landscape, architecture, material culture and the road networks as they relate to evolving ritual systems and interaction networks. The structure of post-Bonito phase communities in the San Juan Basin is also addressed. Recent definitions of the Chaco phenomenon will be evaluated within the framework of Anasazi regional organization.

### [18] HOLISTIC ARCHAEOLOGY: BEYOND THE MATERIALIST-IDEALIST OPPOSITION

In the heat of debate between processual and post-processual archaeologists, polarization has occurred, and prominent scholars define their perspectives primarily in opposition to others. As a result, significant aspects of theory and practice in contemporary archaeology are going unrecognized. Contrary to the rhetoric of competing ideologies, the materialist and idealist paradigms are not intrinsically incompatible, and high-level explanation requires their integration in a broader theoretical framework. In the last decade, archaeologists in several regions of the world have without fireworks done comprehensive, problem-oriented research, with results that illuminate the processes of human existence.

### [19] TIGER ON THE HORIZON: A REEXAMINATION OF "CHINESE INFLUENCES" ON THE MANCHURIAN BASIN AND KOREAN PENINSULA

This symposium examines the term "Chinese influences" and the phenomena of cultural interaction ascribed to it. The nationalistic implications of the term are challenged as well as its implied unidirectionality. The papers focus on regional development and interaction, dealing with questions of ethnic identity, acculturation, and mechanisms of information transfer. The time frame under consideration is the Korean Bronze and Iron Ages (ca. 1000 BC–300 AD) and the corresponding Chinese Zhou and Han periods (ca. 1100 BC–220 AD).

### [20] GAMBLING ON AGGREGATION: RISKS AND REASONS FOR THE FORMATION OF AGGREGATED COMMUNITIES IN PRESTATE SETTINGS

The shift from dispersed hamlets to villages has been characterized as a relatively brief formative period that gives way to complex, socially stratified societies. Research over the last decade demonstrates that this unilinear evolutionary framework is flawed and that the shift between aggregated and dispersed settlements in prestate societies is a complex and sometimes recurring phenomenon. Examples of village formation and abandonment will be examined from a variety of time periods and worldwide settings. The symposium will focus on both the processes that result in aggregation and the organizational and economic differences between aggregated and dispersed communities in prestate settings.

## [30] Fires and the Archaeological Record

### [21] FROM KOSTENKI TO CLOVIS: STALKING THE MAMMOTH HUNTERS

This session will present synthetic papers on our current state of knowledge about Late Paleolithic and Paleoindian hunter-gatherer adaptation in Eurasia(Western and Central Europe and the USSR) and North America. It will focus on both the similarities and differences as well as on some of the reasons for the analogies and disparities in the record. The session will stress that while much understanding about cultural practices during the time period in question has been gained by research conducted independently in the US and USSR, a number of significant questions about late Pleistocene adaptations can only be answered by taking a global perspective and engaging in collaborative research.

### [23] COLUMBIAN CONSEQUENCES, PART II: RETROSPECTIVE ON A CENTURY OF BORDERLANDS SCHOLARSHIP

This symposium looks retrospectively at the impact of previous Columbus-related "celebrations"—specifically the Chicago World's Fair of 1893. Papers explore how the 1893 gathering (and other similar events) reflected contemporary perspectives and shaped the direction of scholarly research in the next century.

### [26] SAVE THE PAST FOR THE FUTURE

The Society for American Archaeology has become increasingly alarmed at the rate the archaeological resource base of this country is diminishing due to vandalism, looting and erosion. If we cannot successfully combat this problem, we will be reduced to pursuing our profession from arm-chairs or in museum basements. Since we are so few, it is imperative that we pursue cooperative ventures with other interested groups, or we will not be successful in saving the past for the benefit of future archaeologists and the public. This plenary session's participants will discuss various perspectives on developing successful coalitions with other organizations and the need for educating the American public on the value of protecting our cultural heritage.

### [27] PERSONAL MORALS AND DISCIPLINARY IMPERATIVES: ETHICAL ARCHAEOLOGY AND ARCHAEOLOGICAL ETHICS

Archaeology has devoted relatively little attention to the ethical requirements of our discipline outside those related to Cultural Resource Management and, recently, the treatment of human skeletal remains. However, all archaeologists make ethical decisions in their work, often without realizing it. This symposium discusses a range of ethical problems in archaeology, focusing on the distinction between the practice of archaeology in accordance with the personal ethics of individual archaeologists and the ethical standards required by the nature of our discipline. Topics considered include excavation practices, reburial, interactions with Native Americans, international research, treatment of collections, and public archaeology.

### [28] THE ARCHAIC OF THE SOUTHWESTERN UNITED STATES AND NORTHERN MEXICO

Some of the ancient populations which gave rise to the Formative cultures in Mesoamerica and the American Southwest had their beginnings in the arid foothills and basins of the Sierra Madres, and Basin and Range respectively. To date the origin and lifestyles of these early hunting and gathering cultures have never been well understood. Yet, these were among the oldest continuous cultural traditions in North America. This symposium explores the dynamics of the environment, human cultural history, and lifeways to establish a baseline of archaeological knowledge for this poorly known region of southern North America.

### [29] THE ARCHAEOLOGY OF SPATIAL ORGANIZATION IN EUROPE

The papers in this symposium explore economic, political, social, and ritual meanings in the use of space by Europeans from the Iron Age through the Middle Ages. The ways that communities organize their settlement space reflects, and determines, the priority they give to specific economic, political, and ritual activities. Archaeologically recognizable changes in systems of spatial patterning enable us to identify major changes in culture. Topics of individual papers range in scale from the organization of space within individual houses to the siting of monuments in landscapes.

### [30] FIRES AND THE ARCHAEOLOGICAL RECORD: DEPOSITIONAL AND POST-DEPOSITIONAL FORMATION PROCESSES

Recent forest fires in the western United States have caused vast resources to be focused upon the study of the causes and effects of fires. Fires are an integral force in North American ecosystems. However, despite the emphasis that has been placed recently upon understanding the archaeological record in more dynamic terms, there is still a dearth of knowledge concerning the effect of fires on cultural deposits and the means for discerning natural (fortuitous effects) from cultural (intentional effects) fires. This symposium was organized to gather current knowledge of how fires influence, distort, and cause archaeological deposits.

**[31] BEYOND STRUCTURALISM AND THE SYMBOLIC: KEY THEMES AND DIRECTIONS IN POST-PROCESSUAL ARCHAEOLOGY**

The aim of the session is to give a synoptic presentation of what has been termed 'post-processual' archaeology, with an emphasis less on polemic and critique and more on practical workings with material culture and the past. Not to provide methodologies or 'case studies', but to locate the abstract and the general in particular encounters with the past and its representation. The papers will focus on the following themes: narrative, style, writing material culture and the past; dialectics of the past and present, theory and practice; the politics of academic discourse; archaeology and cultural critique, epistemology; gender, past and present; the form of a social archaeology.

**[32] PREHISTORIC HUNTER-GATHERER ADAPTATIONS ON THE INTERIOR PLATEAUS OF NORTHWEST AMERICA**

Hunter-fisher-gatherers occupied the interior Plateau of Northwestern America throughout prehistory, beginning as free-ranging Clovis hunters and culminating as highly-organized, semisedentary, broad-spectrum collectors. The first archaeologists to study this diverse region sketched the broad outlines of evolving adaptations, and it is their findings that continue to be repeated in textbooks. However, two decades of intensive research have elaborated on and modified that outline, identifying long, detailed sequences valuable for theory building about hunter-gatherer behavior. A change in the discipline's understanding of the region is overdue. This symposium assembles the active researchers to present an up-to-date chronological and thematic view of prehistory in this long-neglected area.

**[34] ALASKAN NATIVE DISPERSAL AROUND THE NORTH PACIFIC UNDER THE RUSSIAN-AMERICAN COMPANY: ARCHAEOLOGICAL EVIDENCE**

The Russian-American Fur Company and its immediate predecessors (ca. 1742–1867) in their hunt for the valuable furs of the sea otter (*Enhydra lutris*), forcibly employed the help of skilled kayak hunters from Alaska. These included Aleuts, Kodiak Eskimos, and coastal Athabaskan Indians. They were carried to the far reaches of the North Pacific extending from the Kurile Islands to Baja California. The session papers will concentrate on a variety of archaeological sites occupied by these Alaskan natives with a view toward similarities and differences in retention of their tools and customs and transference to new customs and technology.

**[36] RECONSTRUCTING SOCIAL ORGANIZATION AT THE HOUSEHOLD LEVEL IN MESOAMERICA**

Excavation of households has become a recognized focus of research in Mesoamerican archaeology. Moving beyond the preliminary description of architecture and artifacts this symposium goes one step further, to the reconstruction of intra-site social dynamics. The papers represent various areas of Mesoamerica to provide regional perspective. The authors employ different methods to address the question of household organization, such as analysis of activity areas or ethnoarchaeological studies. In several cases there is sufficient information to make comparisons between sites, rural and urban areas, or commoner and elite status.

**[37] CURRENT ISSUES IN ARCHAEOLOGICAL SITE PROTECTION AND PRESERVATION**

Issues associated with the concept of in-situ archaeological site protection and preservation as a viable management alternative to large-scale data recovery or avoidance options are of critical concern to the idea of a conservation ethic in archaeology. These issues vary according to diverse patterns in land management approaches, land and resource use, visitor impacts, and research orientations. The papers in this session examine these issues from various perspectives and incorporate discussions of several related themes, including site protection/preservation project planning and implementation, agency-specific regulations and policies, project monitoring, ongoing research avenues, and future research needs.

**[38] ALTERNATIVE ADAPTATIONS TO ARID ENVIRONMENTS: THE ARCHAEOLOGY OF THE SOUTHERN GREAT BASIN**

The southern Great Basin of North America ranks among the most arid environments in the world. The archaeological record of human occupation in the region reveals a variety of adaptations to this harsh regime. Drawing on abundant recent archaeological research in the southern Basin, this symposium examines what we know of the variety of human adaptations there, and addresses several issues concerning human adaptation to arid environments generally: 1) the scale of regional adaptations to arid settings; 2) variability in occupation of arid regions; and 3) the relationships between occupation of arid environments and occupation of more congenial environments.

**[42] LIFE ABOVE THE TREELINE: PATTERNS OF PREHISTORIC ALPINE LAND-USE IN WESTERN NORTH AMERICA**

The alpine and sub-alpine communities of western North American mountain ranges are marginal environments that contain exquisitely detailed records of prehistoric land-use. These records are more

intact, more easily dated, and more readily related to models of paleoclimate than those normally available from lower settings. Montane archaeological research in California, Nevada, and Colorado illustrates the many advantages of studying hunter-gatherer adaptation from the alpine perspective and documents the particular sensitivity of alpine subsistence and settlement to climatic, demographic, and technological change. Common to these studies is the assumption that alpine archaeology is useful primarily for the light it sheds on regional adaptation.

**[44] THE SOCIAL IMPLICATIONS OF SYMBOLIC EXPRESSION IN THE PREHISTORIC AMERICAN SOUTHWEST**

Archaeologist, anthropologist, and art historians working in the American Southwest now have sufficient information on prehistoric design to assess the social implications of those designs. The context/social landscape in which particular motifs occur and their temporal development are explored in attempting to derive meaning from the designs. Particular attention is paid to cross-media analysis, and methods for deriving meaning are discussed. Ultimately, the possible relationships between design "messaging" and significant changes in Southwestern society are explored.

**[45] WRITING FOR POPULAR JOURNALS**

A workshop designed to sharpen archaeologists' writing skills and strengthen their understanding of the needs of general-interest publications. Informal discussions and brief workshop activities will focus on the "human interest" requirements of popular writing—the need to be colorful, entertaining and provocative. Structuring a tight essay, finding the right tone, and editing one's own work will be among the many topics discussed. The co-organizers will draw from their experience as editors of *ARCHAEOLOGY Magazine* in considering how the magazine goes about finding material, generating new ideas, and collaborating successfully with authors from the assignment stage to final page proofs.

**[46] FRYXELL SYMPOSIUM 1990: THE STATE OF INTERDISCIPLINARY RESEARCH IN ARCHAEOLOGY**

This symposium reviews the role and potential of interdisciplinary research in contemporary archaeology. The specialization that is now common among archaeologists may fragment the information that is obtained about a particular problem, despite the holistic goals of the field. A new phase of research must emerge, in which communication between specialists will allow comparison and evaluation of complementary data. These papers examine data sets, methods of comparison, and theoretical models that exemplify productive application of these intra-disciplinary research strategies.

**[48] COLUMBIAN CONSEQUENCES, PART III: BEYOND DISCIPLINARY BIAS: FUTURE DIRECTIONS IN CONTACT PERIOD RESEARCH**

In the past 100 years archaeological and historical knowledge of the Columbian period has changed substantially due to structural changes in disciplines and to the weight of empirical observations. Despite these changes, there are major problems in our perceptions, explanations and description of the contact period. In this symposium, problems relating to effect of disciplinary biases in archaeology, history, and demography are discussed. Future directions in Columbian period research are suggested. Areal coverage ranges from the Southeastern United States to Hawaii.

**[50] THE AZTEC CITY-STATE OF OTUMBA: A CASE STUDY IN CITY-STATE POLITICAL AND ECONOMIC EVOLUTION**

Recent surface surveys and surface collections at the Aztec city-state capital of Otumba, Mexico (TA-80), and at several dependent sites, along with excavations at Otumba, have provided detailed data on craft production (obsidian, groundstone, figurines, fibers, lapidary), the distribution of craft products, the sequence of construction in the nucleated core, and agricultural intensification. These were important in the development, functioning, and decline of the Otumba city-state from ca. 1300 to 1560. The symposium papers present details of these data and their implications for Aztec political and economic evolution in other areas in the Basin of Mexico.

**[52] WINDOWS ON THE PAST: PUBLIC INVOLVEMENT IN CRM**

**WINDOWS ON THE PAST** is an outreach program designed to enhance the educational and recreational experiences on National Forests by developing opportunities to visit, learn about, and participate in archaeological and historical projects. We will present an overview of the Windows program, its goals and objectives, and some of the products and potential products being considered in each region of the country.

**[53] PALEOINDIAN ADAPTATIONS IN SOUTHWESTERN NEBRASKA PHASE I: PREVIOUS RESEARCH, PALEOENVIRONMENTAL DATA, AND THE ALLEN SITE**

Salvage excavations in the Medicine Creek Drainage in SW Nebraska during the 1940's and 1950's produced substantial collections from a series of early Holocene sites, collections which have never

been fully analyzed. The Medicine Creek Paleo Project is a 5 year program of research centered on these sites. This session summarizes previous work at Medicine Creek and presents the results of the first year of the current project, with a major emphasis on 1) field geomorphic/paleoenvironmental studies, 2) evidence for a previously undetected Clovis occupation of the drainage, and 3) analysis of extensive, well-documented existing collections from the Allen Site (25FT50).

#### [55] LATE QUATERNARY PALEOENVIRONMENTS: PALEOCLIMATIC INTERPRETATIONS AND ARCHAEOLOGICAL IMPLICATIONS

Surveys, new excavations, and re-excavations in the Levant over the past decade have greatly increased the data base on Late Quaternary paleoenvironments. Paleoclimatic information, generated by the recovery of pollen, macrobotanical, geomorphological and paleontological data, indicates that the Levant was subjected to a series of humid and cool phases, separated by relatively dry and warm ones. The archaeological responses to these shifts in paleoclimates is the subject of this symposium.

#### [56] ABANDONMENT PROCESSES: STRUCTURES AND SITES

Abandonment is critical to site formation. Abandonment processes determine the spatial patterning, organizational structure, and composition of archaeological remains. This symposium will define abandonment processes and identify variability generated by abandonment in the archaeological record at the level of the individual structure. Papers use ethnographic, ethnoarchaeological, and archaeological data to isolate the range of factors conditioning abandonment of structures within sites and to develop criteria for their archaeological recognition.

#### [58] THE ARCHAEOLOGY OF THE CULTURAL LANDSCAPE

The concept of cultural landscape is used to analyze the dynamic tension between land use and social action. The cultural landscape links the humanly-created physical world with the symbolic meaning implicit in that world. The built environment serves as the location of economic relations and provides the symbolic context in which those relations occur. The concept has applications not only for archaeology but for general anthropological theory as well. Papers in this symposium use cultural landscape to explicate the active links between social relations and the built environment.

#### [59] SMALL SITES IN THE BIG PICTURE: THE IMPORTANCE OF SMALL SITES IN UNDERSTANDING ORGANIZATION IN THE PREHISTORIC SOUTHWEST

Although regional settlement surveys have been conducted for many years in the Southwest, characterizations of late prehistoric subsistence activities and social organization continue to be largely derived from investigations at only a small number of aggregated villages. Evidence from temporary habitation sites and a wide variety of agricultural facilities broadly distributed across the prehistoric landscape have often been neglected because these remains are considered to be peripheral to residential core areas. Fields, hunting and gathering sites, and shrines are integral components of the community. The placement of these sites offer primary information for understanding the organization of prehistoric communities.

#### [62] INTERACTION SPHERES IN THE CARIBBEAN

Interaction involves the exchange of tangibles and intangibles through which relations between individuals, communities, societies, and cultures are established and maintained. The definite terrestrial boundaries of islands and their differences in physical variables (size, isolation, resources) create unique opportunities for the study of interaction. Papers in this symposium make use of the laboratory-like conditions in the Caribbean islands to investigate interactions at different times, in different parts of the Caribbean, among different cultures, and at various scales. The combined effect is an elucidation of the interplay of cultural and physical variables in the development of Caribbean cultures.

#### [64] IMAGE AND INFORMATION IN THE AZTEC WORLD

The Aztec world encompassed urban capitals, towns, and rural villages in many provinces that were welded together into a single political entity, the Aztec empire. Within the empire, material objects conveyed information about individuals' political position, social class, ethnic affiliation, and religious beliefs. Papers in this symposium examine explicitly visible items such as art works, architecture and personal accessories, as well as less visible objects, as conveyors of information in this multi-ethnic state. Urban-rural, elite-commoner, and capital-provincial distributions of artifacts and information are considered.

#### [66] CRM DATABASES: ORGANIZATIONAL, TECHNICAL AND ETHICAL ISSUES FOR THE 1990S

This symposium addresses the development and use of CRM databases in the United States, Canada and Great Britain planned for the 1990s. Attention is given to the managerial, technical and ethical

issues confronting national and state/regional organisations providing and using archaeological and heritage information—particularly for monument and records conservation, academic work, education, and their own operational planning. The experiences of national and state organizations are examined to identify the solutions at present perceived.

#### [68] THE IRVINE COAST ARCHAEOLOGICAL PROJECT: ARCHAEOOMETRY AND CULTURAL RESOURCE MANAGEMENT IN SOUTHERN CALIFORNIA

The Irvine Coast Archaeological Project is a large privately funded archaeological data recovery project which encompasses 30 sites in a 4.4 square mile area of coastal Orange County, California. The project emphasizes large scale horizontal exposures to recover features (usually hearths) and associated artifacts and faunal remains. Over 2000 cubic meters of excavated earth have been processed through water screens. Archaeometric techniques, including radiocarbon dating, thermal remnant magnetism, carbon isotope ratios, oxygen isometry, geophysical remote sensing, and pollen and macrobotanical studies, have contributed important data regarding environmental reconstruction, and the location, age, and seasonality of features.

#### [70] CRAFT SPECIALIZATION IN COMPLEX SOCIETIES: EVIDENCE FROM ANALYSES OF STONE TOOLS

Now that techniques for deriving a variety of data from stone tools have been developed, lithic analysis has become a feasible way to study craft specialties which involve the use of stone tools. This symposium brings together researchers working in different areas of the world on questions of craft specialization in settings of complex societies. Presenters draw on lithic functional data, use-wear studies and consumption patterns of stone tools employed in various occupations to explore specific craft activities in depth and to address general questions of craft production and exchange within occupationally specialized societies.

#### [71] THINKING ABOUT EATING

Food is meaningful from every anthropological perspective. Although sociocultural anthropologists have investigated the many roles of food in culture, archaeologists have viewed food remains primarily as a reflection of diet and subsistence production. Here we explore the social and symbolic dimensions of food and eating through ethnographic, ethnohistoric, and archaeological data. Although diverse in time, space, and approach, the studies all demonstrate that the practice of eating is the fundamental nexus of the economic, the political, and the ideological in culture, suggesting therefore that a consideration of the multiple roles of food should promote greater understanding of past societies.

#### [73] BEYOND THE BLACK SAND: SEVENTY-FIVE YEARS OF ARCHAEOLOGY IN THE FLAGSTAFF AREA

Systematic archaeological research in the Flagstaff area commenced in 1916 when Harold and Mary-Russell Ferrell Colton initiated their first archaeological survey. In the intervening 75 years, a variety of researchers, representing a wide diversity of theoretical orientations and methodological approaches, have contributed to the formation of an impressive data base on prehistoric settlement patterns, social organization, material culture distributions, and environmental change. This panel assesses the relevance, representativeness, and quality of that data base with respect to contemporary research questions in Southwestern Archaeology and suggests new avenues of data collection and interpretation.

#### [74] ALTERNATIVE LIVELIHOODS: INVESTIGATING PREHISTORIC SUBSISTENCE CHANGE

This symposium highlights current approaches to the study of prehistoric subsistence change that go beyond simple calorie counting to dynamic investigations of options for survival. While theoretical and methodological orientations among the participants vary, contributions consistently feature a holistic examination of the subject. The assembled papers consider evidence for subsistence change among both hunter-gatherers and agriculturalists in non-state and state level societies. Data bearing on environment, technology, resource and population stress, food procurement and production, and settlement pattern are featured. Geographical foci include the Southwest, the Northwest Coast, California, the Eastern Woodlands, Mesoamerica, the Andes, and the Near East.

#### [75] REEVALUATING SOCIAL AND ADAPTIVE DEVELOPMENTS IN THE NORTHERN CADDOAN ARCHAEOLOGICAL REGION

Recent research in the Arkansas River Valley and the Ozark Highland region of eastern Oklahoma and western Arkansas has enhanced understanding of social and ecological dynamics during the Late Woodland and Mississippi Periods, when mound centers signal the development of societies traditionally labelled "Arkansas Valley Caddoan". Current concerns include site hierarchy formation, strength and directions in economic, social, and ritual interaction, degree of affinity with Red River

Caddoan groups, patterns of bioarchaeological variation, and significance of agricultural intensification. This symposium brings together archaeologist and biological anthropologist with new perspectives on this western version of ranked, farming, Mississippian-related culture.

#### [77] RECENT FIELD RESEARCH ON THE PERUVIAN MIDDLE HORIZON

This symposium will present the results of recent research on the Wari Empire of Middle Horizon Peru. Participants from several research projects will discuss the results of current field work from the site of Pikillacta in the Cuzco Valley, and also from the Chuquibamba Valley in the Southern Highlands, and the Inca and Nazca Valleys of the South Coast. Topics addressed will include Wari settlement patterns on both the coast and in the highlands, Wari architectural technology and function, aspects of Wari ritual behavior reflected in architecture, analysis of midden deposition patterns at Pikillacta, and an analysis of human mortuary remains from the context of Wari offerings and burials.

#### [78] RESEARCH DESIGNS IN THE SECTION 106 PROCESS

An integral aspect of the review of Federal archaeological projects under Section 106 of the National Historic Preservation Act is the development of research designs and data recovery plans which evidence that effects to archaeological properties can be negated or mitigated. Federal archaeologist, State Historic Preservation Office archaeologists, and archaeological contractors will discuss the role of research designs and the role of the reviewer in the Section 106 process. Observed problems and weaknesses in current research designs will be presented, and the logistics of preparing research designs for favorable review will be examined.

#### [79] SAMPLING, TIME, SPACE, AND POPULATION ALONG THE MIDDLE SAN JUAN RIVER

One hundred years of archaeological surveys in the northern Four Corners region have established general understanding of the cultural sequences and population dynamics of this area. Much of this work has been highly subjective or poorly disseminated. This symposium is based on recent and extensive, systematic survey conducted in advance of seismic exploration in extreme southeast Utah. It provides a significant contribution to the understanding of cultural diversity, change, and land use along the middle San Juan River. The effectiveness and reliability of seismic lines as transect samples for projecting archaeological content over a broad area is tested.

#### [81] THE ZAGROS PALEOLITHIC: NEW PERSPECTIVES ON ANCIENT HUMANS IN THE MIDDLE EAST

The Zagros region of the Middle East has a long and varied record of archaeological fieldwork, beginning in earnest with D.A.E. Garrod in the late 1920s. However, with few exceptions, little detailed information on Middle, Upper, and Epi-Paleolithic occupations has been available. Our understanding of the Middle Eastern Paleolithic has thus had a distinctly Levantine bias. This symposium redresses this problem with the presentation of new analyses of data from early and recent fieldwork in the Zagros, incorporating a variety of interpretive views. Presentations explore both the data from particular sites, as well as synthetic overviews of Zagros Paleolithic occupation.

#### [82] ABANDONMENT PROCESSES: SEASONAL VARIATION AND REGIONAL MOBILITY

Abandonment is a key process in the formation of the archaeological record. The causes, circumstances and scale of abandonment condition the spatial patterning, organizational structure, and composition of archaeological remains. The definition of abandonment processes and the identification of the variability generated by abandonment remain crucial analytical goals. This symposium combines ethnographic, ethnoarchaeological and archaeological data to explore temporary, long-term and seasonal abandonment of sites within a framework of regional mobility.

#### [84] PREHISTORIC HAWAIIAN FOOD PRODUCTION: REGIONAL DIVERSITY

A variety of food production strategies can be identified for the prehistoric period in the Hawaiian Islands. Yet, too often only the irrigated form of agriculture is represented in the archaeological literature for this region. This symposium first considers the range of food production strategies—spanning shifting to fixed field systems—that characterize Hawai'i. Next, the relationships between different strategies and either social (e.g., increasing complexity in authority) or ecological (e.g., varying amounts of rainfall) conditions are evaluated using data from the Hawaiian Islands. These studies demonstrate considerable regional heterogeneity in food production that must be integrated into explanations of Polynesian prehistory.

#### [86] HUNTER/GATHERER LACUSTRINE ADAPTATIONS

Cycles of lacustrine resource productivity at long and short term scales of variation can figure prominently in the organization of hunter/gatherer populations. The scheduling of lacustrine resource extraction is keyed to lake ecology and geography, hunter/gatherer density, gender based task divi-

sions, mobility patterns, territorial strategies, sociopolitical complexity, technology, nutrition, and other aspects of behavior. Resultant regularities in the organization of archaeological assemblages, activity areas, sites and regions reflect the interaction of these variables. This symposium explores these interrelationships through a series of case studies from Africa, Asia, Europe and North America spanning the last one million years.

## ABSTRACTS OF PAPERS

*Abbott, David and David M. Schaller (Soil Systems, Inc.)*

[33] HOHOKAM CERAMIC EXCHANGE WITHIN THE SALT RIVER VALLEY, ARIZONA:  
RESULTS FROM THE HOHOKAM EXPRESSWAY PROJECT

The Salt River Valley, Arizona is characterized by distinct zones of mutually distinguishable rock types. Preliminary results indicate that as much as 90 percent of all the Hohokam plain and red ware pottery from the Salt River Valley can be correlated with one of these specific zones. The distributional pattern of these geologic units can be combined with a map of the prehistoric canal systems, which facilitates the study of ceramic exchange within and between several irrigation communities. The ceramic analysis for the on-going Hohokam Expressway project includes a synthesis of previously derived petrographic information, geological data, 300 new petrographic samples, and microprobe chemical assays.

*Adams, E. Charles (Arizona)*

[44] ORIGINS OF THE PUEBLO KATSINA CULT: ICONOGRAPHIC EVIDENCE

About A.D. 1300 there was a major shift in the decorative systems of the groups inhabiting the "puebloan" region of the American Southwest. The shift has been documented in such decorative media as ceramics, rock art, and kiva murals. The shift corresponds with major population dislocation and relocation and aggregation into large pueblos. Anthropomorphic icons in the new decorative system suggest that the shift corresponds with the development of the katsina cult. This paper explores this relationship.

*Adams, E. C. (see Lange, R. C.) [14]*

*Adams, Jenny (Arizona State Museum)*

[47] UNDERSTANDING THE USE OF GROUNDSTONE TOOLS THROUGH EXPERIMENTATION

Experimentation is used as a method for understanding what happens to the surface of granular handstones during use. Both food and nonfood substances were processed and the used surfaces were analyzed. Using low-power magnification it is possible to determine how various substances damage the surface of the stone. Variation in the damage relates to the rigidity of the surface against which the handstone was used and the intermediary effects of the ground substance. These results have direct application to the interpretation of the use of prehistoric ground stone tools.

*Adler, Michael (Michigan)*

[20] POPULATION AGGREGATION AND THE CHANGING SOCIAL LANDSCAPE: LATE PREHISTORIC ANASAZI SETTLEMENTS ON THE NORTHERN COLORADO PLATEAU

Explanations of the development of Northern Anasazi villages have often taken a "Chinese box" approach, describing the settlements as aggregations of increasingly larger arrangements of households, household groups, groups of groups, and so on. This organic approach ignores the fact that the social systems that regulate access to productive resources (i.e., land tenure) function differently in aggregated and dispersed settlement systems. Data from archaeological investigations in southwestern Colorado and cross-cultural analysis of land tenure systems are employed in stressing the attendant changes in the "social landscape" associated with an increasingly aggregated settlement system.

*Adovasio, James M. and R.L. Andrews (Pittsburgh)*

[80] THE HORSE ROCK RUIN (42SA13182) BASKETRY CACHE: AN UNPARALLELED VIEW OF REGIONAL PUEBLO PERISHABLE TECHNOLOGY

A cache of 28–32 Pueblo III coiled and plaited baskets was plundered from Horse Rock Ruin (42SA13182), Monticello Ranger District, Manti-LaSal National Forest, San Juan County, Utah. The US Forest Service recovered most of the collection, which was used as trial evidence. The baskets were then sent to the Perishables Analysis Facility, Cultural Resource Management Program, University of Pittsburgh, for analysis and publication. Technical attributes of the basketry are described and discussed, and the collection is compared to other contemporary Pueblo III assemblages from the study area. The Horse Rock Ruin cache, like the assemblage recently described from Antelope House, Arizona, illustrates the well-developed regionalization and great technical and aesthetic sophistication of Pueblo III perishable manufacture.

*Ahler, Stanley, Paul R. Picha, Robert W. Seabloom and Rodney D. Sayler (North Dakota)*

[30] EFFECTS OF PRAIRIE FIRE ON SELECTED ARTIFACT CLASSES

An experimental program was conducted to determine effects of prescribed prairie burning on 10 selected artifact/material classes. Burn effects were negligible on artifacts in immediate subsurface

*Aldenderfer, Mark*

contexts. Burn effects were common on surface artifacts, being most severe for small items and organic remains. Certain effects from controlled prairie burning are distinguishable from thermal effects on many archaeological specimens, with the latter frequently being far more severe. One can conclude that, in prairie/grassland settings, effects from natural fire can be distinguished from effects from cultural fire, a finding of significance to behavioral interpretations of sites of recent to great antiquity.

*Ahler, Steven R. (Illinois State Museum)*

[40] STRATIGRAPHIC SEQUENCES AND RADIOCARBON DATES FROM MODOC ROCK SHELTER, ILLINOIS

Excavations conducted between 1952 and 1987 at Modoc Rock Shelter (11-R-5) in southwestern Illinois have resulted in the documentation of over 9 meters of stratified deposits in two separate shelter areas. The stratigraphic sequences within the site are summarized, and the suite of 55 radiocarbon dates associated with the strata are discussed. The stratigraphy and chronology of Modoc provide a base line for interpreting culture/historical sequences in the southern Midwest region, as well as changes in Archaic period cultural adaptations and early to middle Holocene paleoenvironmental conditions.

*Ahlstrom, Richard V.N. (SWCA Associates)*

[73] REASSESSING TREE-RING EVIDENCE IN THE FLAGSTAFF AREA

The number of tree-ring dates from sites in the Flagstaff area has more than doubled since 1946, when Colton's study *The Sinagua* was published. The majority of new dates are from samples that were on hand but remained undated when Colton wrote. This evidence contributes to the dating of structures included in Colton's synthesis and of the ceramic groups that underlie Colton's chronology for the Flagstaff area. Tree-ring data also make it possible to reconstruct aspects of community history, and they reveal patterning in the use and reuse of beams incorporated in pit structures.

*Ahlstrom, Richard V.N. (SWCA Associates) [Discussant 56]*

*Akin, Margie (UC-Riverside)*

[11] POSSIBILITIES AND PITFALLS: SITE DATING USING ASIAN COINS IN WESTERN NORTH AMERICA

Can a 400 year old Chinese code be useful in dating a California gold rush site? A new systematic survey of Asian coins found at historic sites in four western states indicates that assemblage analysis yields previously unrecognized possibilities for site dating. Information on the circulation of coins in the countries of origin, combined with knowledge of importation practices in different historic periods provides a profile of coins arriving during certain narrowly-defined time periods. Comparing coin assemblages from sites to the profile can provide dating information. An example from 19th century California is discussed.

*Albert, Lois E. (Oklahoma Archaeological Survey)*

[75] THE LEE CREEK WATERSHED, OKLAHOMA: ITS ROLE IN THE STUDY OF SOCIAL AND ECONOMIC CHANGES DURING THE WOODLAND AND CADDOAN PERIODS

Within the Lee Creek watershed lie archaeologically significant sites dating from the Late Archaic, Woodland, and Early Caddoan periods. Testing in Oklahoma has established the presence of features, structures, artifacts, and plant remains with dates ranging between 2735 and 810 radiocarbon years B.P. (uncorrected). The information gained from these materials can contribute to our understanding of social and economic changes occurring between the Late Archaic and Early Caddoan periods for the Northern Caddoan area. Specifically, plant exploitation (potentially including adoption of horticulture) and changes in domestic structures and activities can be addressed.

*Aldenderfer, Mark (UC-Santa Barbara)*

[70] LATE CLASSIC LOWLAND MAYA CARPENTRY AND LAPIDARY CRAFT SPECIALTIES: THE FUNCTIONAL EVIDENCE

While it is well-known from iconography and material culture that carpentry and lapidary craft specialists were present in Late Classic Lowland Maya society, almost nothing is known of the tools used in these specialties and the degree to which these tools differ from those used in other crafts as well as household activities. Furthermore, there is little known of the spatial distribution of these crafts and the implications of that distribution for understanding the control of production of these commodities. This paper explores the functional evidence for these specialties as derived from high-power microwear analysis of an assemblage of lithics from center and rural contexts in the central Petén lakes region of Guatemala.

*Alete, Thomas (Bloomsburg)*

[25] SOCIOPOLITICAL DIVISIONS AMONG THE LATE PREHISTORIC PUNAES OF COASTAL ECUADOR

Archaeological research undertaken on La Puna Island, south costal Ecuador strongly suggests that the Punae were organized into regional sociopolitical units. Evidence for this comes from ceramic assemblages that differ geographically with respect to decoration and form. Material from western La Puna is nearly identical to the La Libertad pottery of the Santa Elena Peninsula; pottery from the south is remarkably like the Garbanzo ceramics of northern Peru. Evidence indicates that Garbanzo belongs to the Integration Period of the Ecuadorian chronology. These discoveries shed light on the structure of Punae society and the organization of the late prehistoric trading economies of coastal Ecuador and Peru.

*Allaire, Louis (Manitoba)*

[62] PREHISTORIC TAINO INTERACTION WITH THE LESSER ANTILLES: THE VIEW FROM MARTINIQUE, F.W.I.

Archaeologists have tended to look separately at the Greater and Lesser Antilles, even during late prehistoric times when the Greater Antilles was a major center of cultural developments. Archaeological manifestations clearly derived or inspired by the Greater Antillean Tainos recently were identified in late prehistoric remains on Martinique. This evidence necessitates a re-examination of the alleged isolationism by contributing data toward the formulation of an Antillean interaction sphere in which the central location of Martinique was significant. Taino manifestations on Martinique are described, processes responsible for this interaction are suggested, and implications for reconstructing Suazoid culture and society are explored.

*Allen, Jane (Bishop Museum)*

[84] AGRICULTURE IN WINDWARD O'AHU: ITS ROLE IN THE EVOLUTION OF THE HAWAIIAN STATE SYSTEM OF GOVERNMENT

Fertile valley and slope soils were cultivated by A.D. 500 in windward O'ahu, using irrigated, non-irrigated, and combined technologies. Field complexes in Kane'ohe, Maunawili, and Kawai Nui apparently underwent major expansions after A.D. 1200, during a period of great sociocultural change in the Islands. These sites are discussed in terms of their implications for increasing social complexity and for the evolution of the Hawaiian state system of government.

*Allen, Kathleen M. (Tulane)*

[49] CLIMATIC VARIATION AND CULTURAL DYNAMICS IN NORTHEASTERN NORTH AMERICA

The relationship between climatic change and cultural dynamics for the Late Woodland period (A.D. 900–1650) in the eastern Great Lakes is investigated. Temperature is a critical climatic variable, particularly among groups, such as the Iroquois, near the northern limit of maize horticulture. Climatic fluctuations in temperature and precipitation identified as the Little Climatic Optimum (A.D. 900–1200) and the Little Ice Age (A.D. 1450–1850) occurred during this time period. Associations between these climatic episodes and full scale adoption of horticulture, the appearance of large villages, and the characteristic spacing arrangements of settlements and tribal groupings are examined. Conditions are modeled using Geographic Information Systems.

*Altschul, Jeffrey H. and Jeffrey A. Homburg (Statistical Research)*

[05] THE RELATIONSHIP BETWEEN AGRICULTURAL SYSTEMS AND SETTLEMENT PATTERNS IN THE LUKACHUKAI VALLEY

Bureau of Indian Affairs sponsored excavation and survey have documented three major settlement patterns in the Lukachukai Valley of northeast Arizona. During the Basketmaker III Period, population was dispersed throughout the region in small to medium sized habitation sites. The late Pueblo II–early Pueblo III Period witnessed population aggregation in the lower part of the alluvial fan. In the early Navajo Period, settlement was again dispersed in small units throughout the region. Changes in settlement can be associated with different agricultural systems. A model relating population, soils, settlement size, and site location is presented.

*Altschul, J. H. (see Ciolek-Torrello, R. S.) [35]*

*Ambrose, S. H. (see Sikes, N. E.) [47]*

*Ames, Kenneth M. (Portland State) [Discussant 32]*

*Amick, Daniel S. (Desert Research Institute), Richard O. Rose (Midland Archaeological Society) and Jack L. Hofman (Oklahoma Archaeological Survey)*

[54] SHIFTING SANDS: A NEW FOLSOM-MIDLAND CAMPSITE FROM THE MONAHANS DUNES OF WESTERN TEXAS

Extensive remains of Folsom-Midland occupations have been revealed in a series of 5–8 meter deep blowouts. Over 5000 lithic artifacts (including 500 tools) have been collected providing an important assemblage for regional comparison. Both conservative and wasteful strategies of toolstone use are evident which implicate evaluations of Folsom technological organization. This pattern of toolstone use suggests situational needs often affect technological behavior. Therefore, dissecting the sequence of tool using and manufacturing activities is critical for evaluating technological organization. Preliminary investigation of intra-site patterning indicates spatial differentiation of activities which is related to the sequence of tool use.

*Anderson-Gerfaud, Patricia (CNRS-Institut de Prehistoire Orientale)*

[70] EXAMPLES OF TOOLS SHOWING CRAFT SPECIALIZATION ACTIVITIES IN THE HARRAPPAN OF PAKISTAN AND THE NEOLITHIC OF TURKEY

Enigmatic tool types found in two distinct cultural contexts, flint blades with oddly-distributed "gloss" and heavily-abraded dentate obsidian tools, have been commonly assumed to be "sickles". However, microwear analysis of tools of these types from Nausharo (Harrappan, Pakistan) and Cafer Huyuk (Neolithic, Turkey) revealed odd "mechanical-appearing" microwear traces which experiments showed correspond most closely to the tools edges having been pressed and pivoted against particular lithic objects (found in the same levels as the tools) in order to shape them while they were turned on a wheel. In this manner, at Nausharo, humid ceramics were shaved and burnished and at Cafer Huyuk, grooves and ridges were made on stone bracelets.

*Anderson, L. M. (see Sullivan, L. P.) [61]*

*Andrews, Anthony (New College of USF)*

[01] THE EARLY MISSION CHURCH IN YUCATAN: AN ARCHAEOLOGICAL PERSPECTIVE ON THE COLONIAL PROCESS

The early mission churches and chapels of rural Yucatan are potentially valuable sources of information on Indian-Spanish relations during the contact period and the first century of Colonial rule. Past research on these sites is reviewed, a typology of structures is presented, and potential methodologies for future archaeological/ethnohistorical research are explored.

*Andrews, Nancy (Northern Arizona)*

[04] CONTRACT ARCHAEOLOGY'S CONTRIBUTION TO ARCHAEOLOGICAL RESEARCH: A CASE STUDY FROM ARIZONA

The subfield of contract archaeology continues to grow and change, and is having a significant impact on archaeology in Arizona. This paper presents the preliminary results of three (3) approaches to quantifying contract archaeology's contribution to and impact upon Arizona archaeology. Data from professional journals, academic theses and dissertations, and archaeological research projects on the Coconino National Forest are combined to address the question: What is contract archaeology's contribution? In addition, research contributions from both contract and grant funded archaeological research are compared.

*Andrews, R. (see Adovasio, J. M.) [80]*

*Anovitz, L. (see Zedeno, M. N.) [22]*

*Anschuetz, Kurt F. (Michigan)*

[59] A VIEW FROM A FIELD: SHORT-TERM AGRICULTURE RISK AND LONG-TERM SOCIAL DYNAMICS IN THE NORTHERN RIO GRANDE

Archaeologists have long recognized the existence of extensive gravel and cobble agricultural complexes in the higher latitudes and elevations of the northern Rio Grande. These sites, however, represent only a portion of the agricultural technologies used by Anasazi farmers for coping with unpredictable, localized environmental perturbations. In addition, the periodic large-scale occupation of high plateaus and narrow northern valleys for diverse farming practices manifest a long-term regional strategy to ease, whenever possible, population pressures along the Rio Grande floodplain. The economic, social, and ideological implications of the agricultural complexes are considered in terms of these local and regional adaptive strategies.

*Anyon, Roger and Lawrence C. Todd (Zuni Archaeology Program)*

[08] DIGGING WHERE THERE'S NOTHING: OFF SITE TRENCHING AND ARCHAEOLOGICAL SURVEY

Establishing relationships between humanly produced materials on the modern ground surface, materials on buried surfaces, diffuse materials scattered through sediment sections, and pleoenvironmental

mental data constitutes a fundamental problem facing contemporary archaeological survey. One component of the Navajo-Hopi Indian Relocation Commission New Lands project in eastern Arizona is the extensive use of backhoe trenches in areas outside of archaeological site boundaries as defined by surface manifestations. Sampling off-site exposures for archaeological, geomorphological, and paleoenvironmental data allows development of finer grained interpretations of the biological and geological formation processes that have acted in the evolution of the regional archaeological record.

*Archer, Gavin H. (Garbage Project-Bureau of Applied Research)*

[60] DATA BIAS RESULTING FROM SCREENING OF ARCHAEOLOGICAL MATRIX

Screening of excavated matrix from archaeological sites is a routine field method. Unfortunately, little is known about artifact and other data loss as a result of matrix screening. Screening has been used in five archaeological excavations of modern refuse landfill sites. Representative samples of matrix were subjected to careful micro-analysis of five levels of analysis in order to estimate overall quantities of artifacts lost and differential artifact loss. Results of the analysis show that over thirty percent of matrix consisted of artifact fragments by weight. Sources of variability and relevance for archaeological recovery at prehistoric sites is discussed.

*Archer, G. H. (see Tani, M.) [60]*

*Armelagos, George (Florida) [Discussant 71]*

*Arnold, Bettina (Harvard)*

[29] AN INTRASITE ANALYSIS OF CERAMIC MATERIAL FROM THE HEUNEBURG:  
DECODING EARLY IRON AGE SOCIAL ORGANIZATION

The Early Iron Age hillfort of the Heuneburg on the upper Danube and its associated outer settlement have been the focus of scholarly interest for over a century. The precise nature of the relationship between the peak period acropolis and the contemporary suburbium is as yet unknown; the suburbium is generally considered to have been the habitation of the "less privileged" members of society. This paper will present the results of a ceramic study comparing the two settlement areas, and will discuss such intrasite analysis as applied to social archaeology in prehistoric Europe in general.

*Arnold, Jeanne E. (UCLA)*

[35] THE EMERGENCE OF A COMPLEX POLITICAL ECONOMY AND LINKAGE TO  
ENVIRONMENTAL STRESS IN PREHISTORIC COASTAL CALIFORNIA

Current research at a series of specialized craft production loci on the Northern Channel Islands of California is testing the hypothesis that a sophisticated maritime exchange economy underwritten by elites emerged following a significant Pacific Rim water temperature perturbation ca. AD 1150–1250. Difficult "El Nino" conditions induced serious subsistence stress, prompting intensification of ties with mainland allies and dramatic expansion of specialized bead production for exchange with largely unaffected land-oriented communities. Emerging elites may have taken control of transportation and key goods and processes to solidify power.

*Arnott, Sigrid (Minnesota)*

[71] MEAT, GENDER, AND POWER

The meanings of sexually differentiated meat consumption in the Late Medieval Period are examined. European women used ritualized fasting to gain control in a highly genderized society where social, economic, and religious powers were held by men. Fanatic meat abstinence, begun as a resistant social statement and leading to assertions of individuality and even empowering religious careers, increased as women's other roles and powers were restricted. Saint's lives, autobiographies, and mystical writings are examined from an anthropological perspective against the larger historical/cultural settings to understand the strategies of a low-status group to negotiate power.

*Aronson, Meredith, James M. Skibo and Miriam Stark (Arizona)*

[22] PRODUCTION AND USE TECHNOLOGIES OF KALINGA COOKING POTS: AN  
ETHNOARCHAEOLOGICAL AND MATERIALS SCIENCE PERSPECTIVE

It is difficult to assess the relative importance of technical and non-technical factors in inferring modes of technological decision-making in prehistory. Examination of pottery production and use technologies among the Kalinga using both ethnoarchaeological material and laboratory analysis demonstrates the importance of not only technical (physical properties or functional), but also behavioral or social aspects of technological choices. Kalinga potters may select clays for physical properties, or their proximity; Kalinga consumers may select pots for functional superiority, or for reasons of village allegiance. Explaining the resulting pattern in the material record requires attention to both technical and behavioral aspects of the pottery technology.

*Arroyo, Barbara (Vanderbilt)*

[09] EARLY CERAMICS FROM EL SALVADOR: SITIO EL CARMEN

Recent excavations at El Carmen have dramatically expanded the geographical range of Ecos sites in southern Mesoamerica, now documented as far afield as El Salvador. Radiocarbon dates demonstrate that this site is contemporary with, or earlier than, comparable settlements in Chiapas and Guatemala. Preliminary analyses also indicate regional variation in pottery. A consideration of the dating of the site and the style of its ceramics addresses questions about the origin and distribution of the earliest pottery in Mesoamerica.

*Ashmore, Wendy (Rutgers) [Discussant 36]*

*Auel, Jean*

[26] PARTNERS IN PRESERVATION: ROMANCING THE PUBLIC

Site destruction, vandalism, illegal removal of artifacts, and other depredation that results in deterioration of archaeological resources threaten the very existence of our cultural heritage. The innate fascination of people for the past can make them natural allies in preservation, if they can be educated and convinced of its importance. Preserving the resources of history and prehistory for eventual study may depend, ultimately, on the willingness and ability of archaeologists to reach out and persuade the public of the critical nature of preservation.

*Aveni, Anthony (Colgate)*

[64] CONCEPTS OF SPATIAL AND TEMPORAL ORDER IN THE CONFLICT OF THE TLALOC  
DEBT PAYMENT RITUAL IN THE MONTH OF ATLCAHUALO

By locating and visiting sites around Tenochtitlan that are mentioned in Sahagun's descriptions of the 13 monthly feasts, we can reconstruct the order in which the sites were visited by those making debt payments to the gods. For Atlcahualo, the most likely of several possible routes begins in the north and moves clockwise about the landscape. Among the other ritual passages to peripheral [temple] sites, other patterns of order can be detected. We also discuss the types of information about the cosmology of the state that are being conveyed between elite and common class.

*Bailey, Douglass W. (Cambridge)*

[06] THE SOCIAL REALITY OF FIGURINES

The accepted explanation of Neolithic and Copper Age figurines from South-east Europe has settled in the unsatisfactory realm of fertility cults and Mother-Goddesses. When a more rigorous approach is applied to the material—an approach which takes into consideration specific cultural contexts and the long term trends of figurine use—a more stable conclusion can be formulated. The preferred explanation is grounded on an understanding of societies' need to establish links across the physical gap between the living and the dead. Based on the results of this research, a new approach can be applied to the other 'ritual cult' items from the same periods and cultures.

*Baker, Larry L. (Anasazi Architectural Systems) and Kristin Langenfeld (Navajo Nation Archaeology Department)*

[15] LIVING ON THE EDGE: LARGO-GALLINA COMMUNITIES ALONG THE  
CONTINENTAL DIVIDE

Settlement patterns in the Largo-Gallina region are characterized by a variety of residential and nonresidential site types which, in specific combinations, comprise aggregated communities. These can be viewed as focal points for local residence groups as well as integrative mechanisms for the social, political, and economic systems. Within this context, survey and excavation data from the Continental Divide area are used to delineate individual communities. Emplacement, composition, and size are discussed. Interstices between communities are also examined. The resultant information forms the basis for the development of a model for Largo-Gallina community structure and exploration of inter-community relationships.

*Baldrica, Alice M. (SHPO-Nevada)*

[78] THE USE OF RESEARCH DESIGNS IN NEVADA

Archaeological projects undertaken to comply with provisions of Section 106 often lack serious consideration of research designs. Reviewers of Section 106 generated work, however, play a critical role in ensuring research designs be developed and used. The reviewer may guide the development of research designs for a state archaeological plan and should ensure that surveys and data recovery efforts address regional or local research issues. The use of research designs in Nevada will be examined.

*Bamforth, Douglas B. (Nebraska)*

[53] THE ALLEN SITE IN CONTEXT

The Allen Site is one of three Paleoindian sites in the Medicine Creek drainage of southwest Nebraska which were excavated approximately 40 years ago. Analysis of well-documented existing

collections from this site reveals a pattern of faunal exploitation and lithic technology which does not resemble that seen in other Plains Paleoindian sites. Contrasts between Allen and these other sites, which are generally associated with communal bison kills, suggests that Allen shows us a very different aspect of Paleoindian adaptations and may represent a seasonal period of population dispersion.

*Bamforth, D. B. (see Valdez, Jr., F.) [27]*

*Banks, Larry D. (US Army Corps of Engineers)*

**[03] THE ARCHAEOLOGY PROGRAM IN THE U.S. ARMY CORPS OF ENGINEERS**

This paper presents a brief history of archaeology in the Corps of Engineers and focuses upon the currently existing program. Attributes of organization, function, staffing, and fiscal policies will be discussed in relationship to accomplishments of the Corps in their role as part of the broader Federal Archaeology program.

*Banning, Edward (Toronto)*

**[20] THE SOCIAL STRUCTURE OF NEOLITHIC VILLAGES IN THE NEAR EAST**

This paper will deal with structural differences in the organizations of houses and settlements in the Levantine Pre-Pottery Neolithic (PPNB) and in the Neolithic of the Tigris-Euphrates basin. For some reason, settlements in the latter region developed into politically stratified towns during the Chalcolithic and Bronze Ages, while large, complex PPNB villages in the Levant appear simply to have collapsed. Evidence from the organization of domestic architecture and other sources suggest that fundamental differences in social organization between the two regions may have been a factor in the divergence of their socio-political trajectories.

*Bapty, Ian (Cambridge)*

**[31] OVERCOMING ARCHAEOLOGY: HISTORY AND STRUCTURE IN THE BRITISH NEOLITHIC AND BRONZE AGE**

The paper will involve an interplay between analyses of three regional sequences in the British Neolithic and Bronze Age: the Bone Valley in Ireland; East Anglia; and East Yorkshire in England. In particular it will be argued that there can be observed a shift from an historical consciousness (positing the problem of 'man' in the Neolithic) to a new Bronze Age consciousness (constructed out of the material interplay of structure and positing the problem of 'nature'). By exploring this duality within past and present a theoretical position will be mapped in relation to the genealogies of morals and power of Nietzsche and Foucault.

*Bar-Yosef, Ofer (Harvard)*

**[86] PREHISTORIC LACUSTRINE ADAPTATIONS IN THE NEAR EASTERN LEVANT**

Although the majority of Near Eastern prehistoric sites situated on lake shores are found in the Levant, this may only be a reflection of the amount of research in this area compared to other regions. Beginning with the Lower Pleistocene sequence at 'Obeidya and continuing through ephemeral Middle Paleolithic occurrences and Upper Paleolithic sites, lakes apparently served as "permanent" sources of water, while their shorelines and adjacent plains provided suitable habitats for higher frequencies of mammals. Only the Natufian culture provides ample evidence for fishing and trapping water-fowl, a strategy later employed by the Early Neolithic farmers who were also intensive and extensive hunters and gatherers.

*Bar-Yosef, O. (see Belfer-Cohen, A.) [55]*

*Barnes, Gina L. (Cambridge)*

**[19] THE YELLOW SEA INTERACTION SPHERE**

With the rise of complex societies in East Asia, the Yellow Sea and adjoining Bohai Bay became a focus of cultural interaction between the Chinese mainland, the Manchurian Basin and the Korean Peninsula. Current understanding of this interaction is overwhelmingly unidirectional, couched in terms of "Chinese influence." Recent discoveries and new interpretations, however, argue for considerable local development, though these are again masked by assessments of cultural affiliation. This paper devises terminology for circumventing nationalistic label and investigates the sources and multi-directionality of cultural interaction in the Yellow Sea Basin.

*Barnes, James E. and Jerome C. Rose (Arkansas)*

**[75] DENTAL VARIATION, POPULATIONS, AND GENETICS AMONG THE PREHISTORIC CADDO**

The prehistoric peoples occupying the "Caddo Culture Area" are frequently considered a coherent group. Schambach has recently questioned the relationship of "Caddo" groups in the Arkansas River region to those to the south. To ascertain the biological continuity between the Arkansas, Ouachita,

and Red River regions, the frequencies of hypodontia, polyodontia and peg-shaped teeth are compared. The populations inhabiting the Arkansas River region differ significantly from those of the Red River and Ouachita Mountains regions, which do not differ significantly from each other. These data indicate that the assumption of genetic continuity across the Caddo culture area is invalid.

*Barrett, John (Glasgow)*

**[31] THE MEANING OF THINGS: A CONSIDERATION OF THE ARCHAEOLOGICAL TREATMENT OF THE 'BEAKER PHENOMENON'**

The aim of the paper is to demonstrate the way material conditions are involved in the fields of discourse/practice through which social realities are reproduced. The meaning of past artifacts is implicated in these strategies of social reproduction and emerges as archaeologist attempt to write histories which capture something of the strategies of political domination and resistance through which people once lived out their lives. The paper will take what is normally regarded as a large scale phenomenon, the 'beaker network' of late Neolithic Europe, in an attempt to show how this may have arisen through such local strategies of day-to-day life.

*Bartolotta, Kim (SUNY-Buffalo)*

**[47] SEDIMENT AS ARTIFACT: A SUBSTANTIVE EXAMPLE FROM A NORWEGIAN FARM-MOUND**

Archaeometric methods are applied to Haug, Norway addressing the questions: what composes the strata of a site; what was the mechanism of transport; from where are the strata derived; and how are they altered by cultural activities. The techniques include: size, shape and texture analysis of sediment particles; chemical composition using Inductive Coupled Plasma Spectrometry (ICAP); and C13-C14 isotopic analysis. Columnar sampling allows inspection of the sediment between strata throughout the occupation period of the site as well as within individual strata. The resulting analysis is aimed at interpretation of the sediments of a site as "artifacts".

*Barton, C. M. (see Lindly, J.) [22]*

*Basgall, Mark E. (Far Western Anthropological Research Group)*

**[78] SUFFERING THE FOOL: OBSERVATIONS ON RESEARCH DESIGNS AND CONTRACT ARCHAEOLOGY**

Although research designs (RD) are habitually prepared for archaeological projects conducted under Section 106 of the National Historic Preservation Act, too often the utility of such documents is compromised by unclear or missing linkages between method, theory, and the scope of work. This paper examines the role of RDs from the perspective of the private contractor, focusing on: the scale of the RD versus objectives and potential of the project, the quality of the RD as a measure of anticipated performance, the good and bad of programmatic treatment plans, and the process of reviewing RD implementation.

*Basgall, Mark E. and M. C. Hall (Far Western Anthropological Research Group)*

**[38] ADAPTIVE VARIATION IN THE NORTH-CENTRAL MOJAVE DESERT**

One of the more barren, inhospitable areas of North America for most or all of the Holocene, the north-central Mojave Desert nonetheless contains a remarkably diverse archaeological record that reveals major adjustments in cultural adaptation since the end of the Pleistocene. Diachronic continuity in paleoenvironmental circumstances across the region suggests that shifts in patterns of resource exploitation, settlement structure, raw material acquisition, and residential mobility can be attributed largely to factors other than gross environmental change. Recent research, emphasizing methodological approaches that identify and control for the complexities of site formation, provides a basis for exploring the dynamics of regional adaptive variability over time.

*Bassett, Everett (Dames & Moore)*

**[11] SPATIAL ANALYSIS OF APACHE SOCIAL ORGANIZATION**

The relationships shared by individuals within a community are reflected in the organization of their residential units. Social units serve varied purposes and we can therefore expect those units to change differently in response to external pressures. This can be observed archaeologically. The spacing of wickiups within eight Apache camps in central Arizona are studied and changes in the configurations of the gowa, gota, and itagota are recognized and tracked from 1890 to 1940. Changes in these relationships are correlated with documented changes in Apache social organization caused by participation in the American capital economy.

*Bates, J. K. (see Stevenson, C. M.) [33]*

*Baumler, M. F. (see Speth, J. D.) [81]*

***Bayman, James M. and Suzanne K. Fish (Arizona State Museum)*****[74] LOCATIONAL SHIFTS IN SONORAN DESERT SUBSISTENCE**

By the Classic Period (ca. AD 1100), the Hohokam in the Sonoran desert in southern Arizona had increasingly expanded production on marginal land away from major watercourses. Two existing technologies figured in this expansion. New evidence has revealed that reservoirs were perennial water sources and were deployed at a number of desert-based villages. Runoff agricultural complexes were also expanded on poorly watered valley slopes. Implications of these changes for settlement and subsistence patterns are evaluated. Models of landuse expansion from the Tucson Basin are examined using data from the broader Hohokam tradition.

***Beaton, John M. (UC-Davis)*****[07] SUBSISTENCE AND FLUCTUATING LAKE LEVELS AT TULE LAKE AND FAR****NORTHERN CALIFORNIA**

Initial test excavation at rockshelters on the margins of Tule Lake indicate the importance of fishes in a shallow lake basin noted for its waterfowl. The economics of prey selection are considered to be the primary factor underlying faunal assemblage composition.

***Beck, Charlotte, George T. Jones (Hamilton) and Richard E. Hughes (California State-Sacramento)*****[07] LITHIC RAW MATERIAL PROCUREMENT AND ITS RELATIONSHIP TO LATE PLEISTOCENE-EARLY HOLOCENE POPULATION MOBILITY IN THE CENTRAL GREAT BASIN**

Surprisingly little is known about the adaptive strategies practiced by late Pleistocene-early Holocene human populations in the Great Basin. While we believe these populations were generalists, utilizing resources associated with remnant pluvial lakes, we know nothing of the ranges within which they traveled or the degree of mobility they practiced. Using data generated over the past four years in Butte Valley, eastern Nevada, we consider these questions. In particular, we employ information from obsidian source and hydration studies to examine lithic raw material procurement and its role in structuring patterns of mobility among early Great Basin inhabitants.

***Beck, L. A. (see Williams, S. R.) [61]******Beckes, M. (see Peters, G.) [52]******Begay, Richard M. (Navajo Nation Archaeology Department), Klara B. Kelley and Harris Francis (Navajo Nation Historic Preservation Department)*****[08] CHAMBERS-SANDERS TRUST LANDS PLACE NAMES PILOT STUDY: MEETING RESEARCH AND MANAGEMENT AIMS**

An inventory of place names is a useful tool for identifying significant cultural resources. A place name inventory offers leads to cultural resources in an area, since such resources tend to be named. A place name study of the Navaho "New Lands", historically used by Navajos, non-Indians, and possibly Zuni, provides insights into local history, offers a means for establishing significance, and allows more systematic inventory than compilation of existing data on cultural resources alone. Place name data come from maps, gazetteers, interviews, and printed sources.

***Belfer-Cohen, Anna (Hebrew University of Jerusalem) and Ofer Bar-Yosef (Harvard)*****[55] COPING WITH STRESS: LATE QUATERNARY ARCHAEOLOGY IN THE NEAR EASTERN DESERTS**

Environmental changes in the semi-desertic belt of the Near East had various impacts on the settlement patterns of prehistoric foragers during the Upper Pleistocene-Early Holocene. The results of archaeological surveys and excavations analyzed in the light of current models concerning the behavior of opportunistic scavengers and hunter-gatherers indicate that several options existed at each situation. The outcome of the decisions made by different groups is reflected in the changes in settlement pattern, the emergence of new types of sites and disappearance of certain entities. Desertic environments seem to have been excluded by Mousterian humans, but somewhat more frequently exploited during the Upper Paleolithic. Epi-Paleolithic groups were better equipped but faced some harsh and rapid environmental changes.

***Bellomo, Randy (Wisconsin-Milwaukee)*****[30] IDENTIFYING TRACES OF NATURAL AND HUMANLY CONTROLLED FIRE IN THE ARCHAEOLOGICAL RECORD: THE ROLE OF ACTUALISTIC STUDIES**

Campfire, tree stump fire, and grass fire experiments were systematically undertaken to explore the potential of various scientific techniques for (1) identifying unequivocal traces of fire in archaeological deposits where obvious remains (such as charcoal and ash) have not been preserved, and (2) discriminat-

ing between traces of natural and humanly controlled fire in archaeological contexts. Results indicate that traces of fire can be unequivocally identified using selected methods of archaeomagnetic analysis, while the on-site examination of the composition, three-dimensional configuration, and spatial association of fire features can be reliably used to discriminate between traces of natural and humanly controlled fire.

***Benallie, Larry and Anthony L. Klesert (Navajo Nation Archaeology Department)*****[08] HOW RESEARCH AND MANAGEMENT AIMS ARE BEING MERGED ON THE NAVAJO "NEW LANDS"**

The Navajo and Zuni Archaeology programs are involved in extensive and long-term CRM on the "New Lands" and are determined to conduct the work in a coordinated, comprehensive, research-oriented manner. This demands that the disparate projects within this area be organized under a unified, re-existing research design, that research somehow be made relevant to management objectives, and that other sources of support for research be pursued. We believe all these demands are being met on the "New Lands." This paper identifies means to ensure realization of our long term research goals in this enormous project area.

***Benedict, James B. (Center for Mountain Archaeology)*****[42] ALPINE GAME DRIVES AND INTERCEPT HUNTING IN THE COLORADO FRONT RANGE**

Intercept-hunting structures above timberline in the Front Range vary from simple blinds along game trails to elaborate systems of U-shaped rock walls and stone-rimmed shelters. Each of >50 recorded drive sites represents a unique solution to local problems and opportunities; all share the use of natural or man-made barriers to move large-game animals from tundra grasslands to constricted kill areas where hunters were hidden in ambush. Radiocarbon and lichenometric dates range from 5800 to 360 yr BP. The drive systems reflect communal hunting in late summer and fall by people who wintered at lower elevations.

***Benn, D. W. (see Purrington, B. L.) [75]******Benojo, Julie C. (Boston)*****[36] CERAMICS AND PRECOLUMBIAN COMMUNITY PATTERNING**

The identification and explanation of Precolumbian community patterning has been a long-term goal of researchers in those areas of the Americas characterized by chiefdom level societies at the time of European contact. Site organizational patterns have long been recognized in terms of ceremonial precincts, central plazas, ritual community areas, etc. Patterns indicative of community social organization as reflected in the distribution of identifiable domestic remains, however, have been more difficult to identify and interpret. This paper starts from easily identifiable spatial patterns of architecture at one site in Central Honduras, and uses samples of excavated ceramic material to test a number of hypotheses concerning the social organization of the community.

***Berger, Kathleen, Alan P. Sullivan, III (Cincinnati) and Christian E. Downum (Arizona)*****[14] WHEN IS A FIELDHOUSE? INTERPRETATIONS OF SINGLE-ROOM STRUCTURES AT WUPATKI NATIONAL MONUMENT**

Results of the analysis of 1,041 single-room masonry sites ("fieldhouses") recorded during the inventory survey of Wupatki National Monument indicate substantial variability with respect to assemblage composition, location, and period(s) of occupation. Our contribution explores this variability from different perspectives (e.g., seasonality, economics) and offers several interpretations about the adaptive role of one-room structures in agricultural systems. The usefulness of the "fieldhouse" concept is reevaluated with these new data and interpretations.

***Berlin, G. L. (see Geib, P. R.) [05]******Bernache, Gerardo (Arizona)*****[60] ETHNICITY AND LITERACY: AN ARCHAEOLOGICAL APPROACH**

Archaeological studies have attempted to account for ethnic composition and differential access to resources. Using modern material culture this paper approaches the issue of differential access to literacy resources for different ethnic groups in an urban population. Refuse from two ethnic groups (two Mexican-American neighborhood and one Anglo-American neighborhood) are examined for literacy-related items. Differences in literacy materials for ethnic and sociometric defined groups are identified and explanations for these differences are suggested.

***Bettinger, Robert L. (UC-Davis)*****[42] ALPINE VILLAGES OF THE WHITE MOUNTAINS, CALIFORNIA**

At roughly A.D. 1000 family groups began to establish seasonal base camps (villages) for plant and animal procurement above the timberline (3500 m), in the White Mountains of California. This

superseded an earlier pattern of land-use centering on short-term ungulate procurement. Summering alpine villagers could not have accumulated essential winter stores and probably relied on fall pinyon crops; trade in exotic items may have facilities access to productive groves. Alpine villages reflect increasing pressure on local resources linked to the spread of Numic-speaking peoples. Access to European technology and population decline eliminated that pressure, terminating the alpine village pattern before it could be documented ethnographically.

*Bettison, Cynthia (UC-Santa Barbara)*

[05] SETTLEMENT LOCATION, ENVIRONMENTAL CONDITIONS, AND AGRICULTURAL REQUIREMENTS: AN ARCHAEOLOGICAL INTERPRETATION IN EAST-CENTRAL ARIZONA

A crucial aspect of cultural adaptation is the explicit spatial relationship that exists between the distribution of prehistoric populations and the various food resources available to them at any given time. This paper presents the results of an examination of this spatial relationship in the Lower Zuni River Valley of east-central Arizona. The analysis was conducted by reconstructing the environmental conditions of the study area between AD 900 and AD 1400. The effects of the changing environmental conditions on the distribution of potential prehistoric food resources (specifically agricultural fields) was reconstructed for different time periods. A model of settlement location was applied to the data to produce expected settlement distributions for each time period. The expected distributions are then compared with the actual archaeological data to determine to what extent paleoenvironmental conditions impacted prehistoric settlement locations.

*Bewley, Robert H.*

[81] EXCAVATIONS IN THE ZAGROS MOUNTAINS: HOUMIAN, A MOUSTERIAN ROCK-SHELTER

The Cambridge University Archaeological Expedition to Iran (1969), led by the late Professor C.M.B. McBurney, resulted in the trial excavation of a rock-shelter site, Houmian, in southwestern Iran. Work on the results of the excavation was undertaken by the author. The lithic assemblage has been classified as Mousterian, perhaps even "Zagros Mousterian". The supporting palynological evidence suggests an hitherto unknown interstadial period in the region at about 60–70,000 B.P. This paper will present the results of the study and provide a comparative discussion of the site and its lithic assemblage with other similar sites in the region.

*Bey, George, Craig Hanson and Rachel Hamilton (Tulane)*

[12] THE POSTCLASSIC AT EK BALAM: THE VIEW FROM STRUCTURE 12

Until 1989, the maya center of Ek Balam, perhaps the largest to develop in northeast Yucatan, was thought to have been abandoned at the end of the Terminal Classic or by the Early Postclassic (A.D. 700–1200). However, analysis of material from Structure 12, a large "elite" platform near the site center, indicates that occupation and construction took place during the Middle Postclassic (A.D. 1200–1400). Excavation of Structure 12 revealed a sequence of occupation dating from the Early Classic through Middle Postclassic. This paper is a preliminary assessment of Middle Postclassic Ek Balam, presenting the distinguishing characteristics of the occupation.

*Billman, Brian R. (UC-Santa Barbara)*

[25] PROBLEMS IN THE TIMING AND TEMPO OF THE EVOLUTION OF COMPLEX SOCIETIES ON THE COAST OF PERU

Recent investigations on the coast of Peru suggest significant variation in the timing and tempo of the evolution of economic and political centralization during the Initial Period and Early Horizon. Variation is seen at the broad regional level between the north, central and south coast and between neighboring valleys such as the Casma and Santa. It is suggested that this phenomenon may be explainable in terms of variation in ecological factors that affect the potential for differential accumulation of wealth within societies in a river valley. Variables of importance appear to be relative abundance of maritime resources, extent of arable land, and annual variation in water.

*Bishop, Ronald L. (CAL-Smithsonian)*

[66] SMITHSONIAN ARCHAEOOMETRIC RESEARCH COLLECTIONS AND RECORDS (SARCAR): FROM CONCEPT TO TOOL

The Smithsonian Archaeometric Research Collections and Records (SARCAR) facility combines centralized analytical data bank capability, reference materials management, and special purpose statistical analysis for the use of data derived from the scientific analysis of archaeological and art historical objects. In the process of "loading" the system and seeking "archaeologically meaningful" patterns in subsets of the analytical data, problems involving vast ranges in analytical precision or accuracy have arisen forcing decisions to be made regarding normalization or informational discard.

Identifiable problem areas will be discussed that must be addressed as the data base evolves from a committee's vague concept to a tool or archaeological or art historical utility.

*Biskowski, Martin (UCLA)*

[50] GROUNDSTONE TOOLS AT OTUMBA

In contrast to other classes of artifacts, groundstone tools have received relatively little attention from Mesoamerican archaeologists. Yet, these unglamorous tools are important components in many different kinds of production activities, and, therefore, the study of these tools should provide helpful data with which to examine issues involving craft production and the organization of prehistoric economies. At Otumba, groundstone tools were manufactured from locally available materials and subsequently used in the production of food, cloth, and other goods.

*Black, N. (see Weeks, J. M.) [01]*

*Blake, M. (see Clark, J.) [09]*

*Blakeslee, R. C. (see Morris, E. A.) [22]*

*Blasing, R. K. (see Holen, S. R.) [53]*

*Bleed, Peter (Nebraska) and Daniel R. Watson (Nebraska-Lincoln)*

[11] FRONTIER FLINTLOCKS: A FAULT TREE ANALYSIS OF FIREARM USE AT CONTACT PERIOD SITES OF THE GREAT PLAINS

As a way of examining how firearms were incorporated into native technology and used in native economies of the Plains region, this paper considers gun part assemblages from several euroamerican and native contact period sites from the Plains. These data are presented in terms of a "FAULT TREE ANALYSIS" (FTA), an operations research technique that identifies points of failure in technical systems in order to study patterns of use, maintenance, and reliability. The analysis points to distinctive patterns of gun use and treatment in Indian communities and illustrate the archaeological utility of FTA.

*Blinman, E. (see Toll, H. W.) [17]*

*Blitz, John (CUNY-Geraduate Center)*

[22] CERAMIC ATTRIBUTES AS A MEASURE OF MISSISSIPPIAN MOUND ACTIVITIES

In small-scale societies, ritual feasts are often an important arena for status competition and social integration. Material evidence of such activities may be presented in ceremonial precincts. Ceramic samples from mound and village contexts at the prehistoric Lubub Creek site in Alabama are compared. There are no significant differences in the proportions of decorated types or vessel shapes. However, the mound has a more restricted range of vessel sizes and mound vessels are significantly larger than village vessels. These results suggest that mound activities included large-group feasts and perhaps storage.

*Boden, Martha (New Mexico)*

[61] ERROR PROBABILITIES IN HYPOTHESIS TESTING: A DISCUSSION OF POWER

In the statistical manipulation of archaeological data sets, the concept of power, ability to reject correctly a false null hypothesis, has been neglected. Instead, researchers usually set Type I, or alpha error by convention. It is suggested that Type II, or beta error can and should be calculated to maximize the ability of statistical decisions to discriminate between alternative hypotheses. A hypothetical data set is used to illustrate the pitfalls of test which lack power. Criteria are selected for the reduction of overall error probabilities, and a valid, reproductive methodology is provided for choosing confidence limits in statistical procedure.

*Bograd, Mark (Massachusetts-Amherst)*

[58] THE CHANGING INTERPRETED LANDSCAPE OF WASHINGTON'S MOUNT VERNON

Since 1858 the Mount Vernon Ladies' Association has owned and operated the Mount Vernon estate. The Association sees as its mandate to preserve the property unchanged as Washington left it when he died. Though the Association's intent is to create a timeless landscape, the estate has undergone many changes. This paper will show that the interpreted Mount Vernon landscape is as culturally created as the historic and prehistoric landscapes archaeologists normally study.

*Bolen, K. (see Peterson, J.) [47]*

*Bonde, Sheila (Brown) and Clark Maines (Wesleyan)*

[29] BETWEEN TOWN AND COUNTRY: THE ROLE OF THE SUBURBAN PARISH IN EARLY MEDIEVAL SOISSONS

Urban transformations of the medieval period have been explained by a hierarchical model of urban center and dependent suburban and rural peripheries. We propose a more dynamic relationship among

these spatial elements of the medieval landscape. In Soissons, religious foundations occupied the former administrative core of the late antique town, while suburban centers developed to administer displaced secular and economic activities. The organization of one such suburban center, the parish of Saint-Jean-du-Mont is considered. We define the limits of the parish and identify the relationships among Saint-Jean, other suburban centers of Soissons and the town itself.

**Boone, Elizabeth H. (Dumbarton Oaks)**

**[64] CIVIC SELF-DEFINITION IN THE AZTEC WORLD**

Throughout Mesoamerica in the several hundred years before and after the Spanish invasion, Indian polities identified themselves and defined their physical extent in paintings on broad panels of cloth, termed *lienzos*. These maps or diagrams of a community and its communal lands functioned in the Colonial period as land titles. This paper argues that, more importantly, the *lienzos* served to convey community identity in space and time, locating a community centrally in a conceptualized geography and establishing it temporally within a deep historical continuum.

**Borremans, Nina (Florida)**

**[22] PREHISTORIC COASTAL SETTLEMENT IN THE CEDAR KEYS, FLORIDA**

Results of formal testing and systematic survey along a 12 kilometer coastal corridor in the Cedar Keys region of the north central Florida Gulf coast provide evidence of a large well-integrated prehistoric population of settled fisher-hunter-gatherers. Discernible pattern of domestic activity at residential sites appear to be regionally distinct and tied to an intensive maritime economy, yet evidence from burial mounds and larger town sites indicates interaction and exchange with other groups in north Florida, especially during the Late Woodland time period.

**Borrero, Luis Alberto (Conicet)**

**[25] DIVERGENT EVOLUTION ON THE STRAIT OF MAGELLAN (FUEGO-PATAGONIA)?**

The Strait of Magellan, which today separates Patagonia from Tierra del Fuego, is a relatively recent phenomenon, dated approximately 8,000 yrs. B.P. When the connection between the Atlantic and Pacific oceans was instated, human populations with a terrestrial adaptation were already inhabiting the region, and segments of those populations became isolated on Tierra del Fuego, where they were exposed to different sets of selective pressures. This situation may account for differences in mobility, hunting strategies, and technology observed historically in groups from Fuego-Patagonia. Recently excavated materials are revised under this new framework, in order to assess the case for divergent evolution.

**Borstel, Christopher L. (Indiana)**

**[47] NEOLITHIC SITE DENSITIES IN EASTERN CHINA: ARTIFACT AND REALITY**

As compared to adjacent hill lands, the central plains of eastern China appear to have lower densities of Neolithic sites. Some archaeologists suggest that such differences accurately reflect Neolithic settlement patterns. An alternative view described in this paper stresses the importance of site visibility and preservation in accounting for differences in Neolithic site density in the region. Thus, along with cases from the Americas and elsewhere, research on the central plains of eastern China emphasizes the need to understand depositional regimes before attempting to construct models of prehistoric settlement patterns.

**Bouey, Paul (Far Western Anthropological Research Group)**

**[33] RECOGNIZING THE LIMITS OF OBSIDIAN X-RAY FLUORESCENCE ANALYSES**

Geological studies of the Coso Volcanic Field in southeastern California have demonstrated patterned variability among trace elements from several outcrops, suggesting the presence of different subsource. Archaeologist have extrapolated from those results with the use of x-ray fluorescence, but they have done so without sufficient caution. Greater chemical variability exists among some subunits than recognized, and specimen size has been found to cause a dispersive influence over quantitative output. XRF methods generally are of good quality, but they are not equal to powdered-specimen analyses. XRF research must be evaluated in light of those technical limitations.

**Bousman, C. Britt and Michael Quigg (Prewitt and Associates)**

**[63] STABLE CARBON ISOTOPES AND HUMAN DIET IN TRANS-PECOS TEXAS**

The distribution of d13C values from human remains in Trans-Pecos Texas demonstrate two dietary populations. d13C values from one well defined population reflect the heavy use of C4 or CAM plants, and the second group depended more heavily on C3 plants but in varying quantities. However, detailed paleodietary studies in the region have identified only a single adaptation specializing in CAM plant exploitation. The anomalous carbon isotope ratios force a reconsideration of hunter-forager territorial models proposed for the Lower Pecos region, and highlight the need to conduct more research on prehistoric diets in Trans-Pecos Texas.

**Bowen, Jonathan (Ohio Archaeological Council)**

**[47] LATE ARCHAIC GROOVED AXES AND MAULS IN NORTHWESTERN OHIO**

In northwestern Ohio polished stone grooved axes and mauls were used during Late Archaic (3000–1000 B.C.) times. Approximately 1000 of these tools have been recorded in the 20,000 km<sup>2</sup> study area. All but one axe component and two of the maul components have yielded 7 or fewer specimens. The three larger components have yielded between 40 and 50 specimens, each. While 75% of the axe components have yielded no mauls, 70% of the maul components have yielded no axes.

**Braddock, L. W. (see Schneider, K.) [52]**

**Bradley, Bruce (Crow Canyon Archaeological Center)**

**[05] PATTERNS OF GROWTH AT PREHISTORIC PUEBLOS**

Intensive architectural and dendrochronological analyses at Sand Canyon Pueblo has provided detailed evidence of building patterns at this large 13th century settlement in southwestern Colorado. Although the principal pattern is accretionary growth in and among building modules organized around kivas, there is also evidence of some preplanning at both the kiva unit and site levels. Comparisons are made with patterns of growth evidenced at contemporary Mesa Verdean and Kayenta cliff dwellings, at Chacoan Great Houses, and at early Western Pueblo villages.

**Bradley, Richard (Reading)**

**[16] THE PASSAGE OF ARMS: VOTIVE DEPOSITS AS AN INDEX OF POLITICAL CHANGE**

The destruction of wealth is one of those features of prehistoric Europe that have a very long history. Sacrifices and votive offerings, often associated with watery locations, took place over at least 4000 years, but the appearance of continuity is only superficial as these practices were constantly modified to suit the political circumstances of the time. That is why the changing nature of votive offerings can provide valuable indications of broader social processes. This paper illustrates this by considering two important transitions that took place in later European prehistory: the change from bronze to iron and the development of a market economy among native societies under the influence of Rome.

**Brady, Timothy J. and Jim Keyser (USFS)**

**[52] CULTURAL HERITAGE WEEK: INTERPRETING AMERICA'S PAST**

Today's Forest Service has redoubled its efforts in such key areas as site enhancement, development, and interpretation for public benefit. To emphasize this shifting focus, the Pacific Northwest Region of the Forest Service sponsored a Cultural Resource Celebration last fall in Portland, Oregon. This event showcased the Northwest's archaeological and historical treasures through exhibits and demonstrations, most of which involved public participation. Two full days were reserved for school children; a total of 1,100 students, from grades 2–5, attended. Our presentation consists of a video program that documents the Celebration, and invites you to participate in true "Public Archaeology."

**Brandt, C. B. (see Ruppe', P. A.) [05]**

**Brandt, Steven A. (Florida)**

**[86] ACROSS THE GREAT DIVIDE: LATE QUATERNARY HUNTER/GATHERER ADAPTATIONS IN THE AFAR RIFT OF ETHIOPIA**

This paper outlines a predictive model of how prehistoric hunter/gatherer populations of the Afar Rift Valley and adjacent highlands of Ethiopia may have adapted to dramatic environmental fluctuations across the Pleistocene/Holocene boundary. The wetlands of the Afar Rift Valley play a prominent role in the model. Lakes are hypothesized to have provided periodically a wide range of resources which contrasted sharply with, but also complemented, resources available in the surrounding mountains, plains and deserts. Predicted changes in socio-complexity, demography, mobility, technology, foraging tactics and settlements are considered in light of excavated data as well as ethnographic and ethnohistoric information on extant Ethiopian lacustrine-adapted hunter/gatherers.

**Brandt, S. A. (see Ellison, J. G.) [82]**

**Bremer, J. Michael (Coconino National Forest)**

**[73] FLAGSTAFF AREA PITHOUSE ARCHITECTURAL VARIABILITY AND DETERMINATIONS OF CULTURAL AND TEMPORAL AFFILIATION**

Historically pit house excavations in the Flagstaff area have contributed to the development of a local cultural classification scheme and have also contributed evidence used to develop a local chronology. In the Flagstaff area pit structures persist as habitations, often associated with masonry pueblos, late into the prehistoric period. As a result of this the form of pit structures has been used as a cultural and temporal indicator. This paper explores the history of this approach given present theoretical domains and offers alternative ways of viewing subsurface architecture.

*Brennan, Curtiss T. (C & M Brennan Foundation), Paul R. Fish and Suzanne K. Fish (Arizona State Museum)*

[33] MARANA: CONFIGURATION OF A CLASSIC PERIOD HOHOKAM PLATFORM MOUND SITE

The overall layout of large Classic Period Hohokam sites incorporating platform mounds is poorly known due to their typical coincidence with modern urban and agricultural land use, and to the restrictions of mitigative contracts. However the Marana Platform Mound site, covering an area of 1.0 x 2.5 km near Tucson, represents a virtually undisturbed single component occupation. Occupants lived in a series of adobe walled compounds. Initial excavations revealed an unexpectedly large example enclosing approximately 7000 m<sup>2</sup>. Full coverage surface mapping, collecting, and initial excavations provide data relating to internal site structure and spatial differentiation.

*Breternitz, David A. (Colorado-Boulder) [Discussant 73]*

*Briuer, Fredrick L. (Waterways Experiment Station)*

[37] GEOGRAPHIC INFORMATION SYSTEMS: A TOOL FOR EVALUATING AND PROTECTING ARCHAEOLOGICAL SITES

Accurate and high quality locational and site attribute information incorporated in an automated regional database offers an efficient management tool for evaluating and protecting archaeological resources. Several automation techniques have been used to construct a large, intensive, multidimensional archaeological database for the U.S. Army at Fort Hood Texas. The database is routinely used for preventing archaeological impacts from a wide variety of potentially destructive actions, including literally thousands of continuing military training actions. A well constructed database offers site protection options that are both cost effective and responsive to long range goals.

*Brody, J. J. (New Mexico)*

[44] CONTENT, CONTEXT, FORM AND MEDIA IN THE PREHISTORIC ART OF THE SOUTHWEST

The subject matter (imagery) of prehistoric visual arts of the American southwest is examined from perspectives of art history, archaeological context, and ethnographic analogy to allow for "thick descriptions" and multiple modes of analysis. It is widely recognized that imagery is given meaning by context but images are only one of many factors contributing to the physical qualities of made objects. Others include technology, media, social context, and artistic decisions which create formal modes of organization. Each factor is potentially independent of all others and must be interpreted if analysis of artistic content is to go beyond the simple naming of images.

*Brook, Richard (BLM) and John E. Douglas (Arizona)*

[03] THE PUBLICS' RETURN ON THEIR ARCHAEOLOGY DOLLARS

Through its planning process, the Bureau of Land Management is trying to move from knee-jerk legal compliance to thoughtful, conservation-minded cultural resource management. Done right, this should allow the Nation's largest body of archaeological resources to be managed for the best possible scientific and public use. While routine compliance will continue to dominate staff time, archaeologist in and outside BLM must also develop new technical skills, equipping them to repay the public for years of patient support. The climate in BLM, with the Director emphasizing recreation and noncommodity resources, is primed for promoting the public relevance of archaeology.

*Brooks, Alison S. (George Washington) and John E. Yellen (National Science Foundation)*

[86] LATER PLEISTOCENE FISHING ECONOMIES OF CENTRAL AFRICA

Recent discoveries in the Semliki Valley of eastern Zaire have indicated that fishing was an important component of human economic behavior there during much of the Later Pleistocene. Faunal remains from four excavated sites attest to a variety of fishing strategies, as well as to the early presence of sophisticated fishing technology (bone harpoons) in a Middle Stone Age context. In the Old World, lacustrine adaptations have often been considered as terminal Pleistocene/Holocene lifeways which allowed more sedentary settlement patterns and were thus direct precursors of neolithic economies. The Semliki evidence suggests instead that lacustrine adaptations have a much older history and may have been important in the origin and spread of anatomically modern human.

*Brooks, Robert (Oklahoma Archaeological Survey)*

[56] HOUSEHOLD ABANDONMENT AMONG SEDENTARY PLAINS SOCIETIES: BEHAVIORAL SEQUENCES AND CONSEQUENCES IN INTERPRETATION OF THE ARCHAEOLOGICAL RECORD

Abandonment processes functioning at the household and community levels have a significant impact on the structure and content of the archaeological record. This paper examines household abandonment processes operating in sedentary Plains societies. Ethnohistoric and ethnographic data

are used to identify causes of household abandonment and procedural events in the abandonment sequence. These events are subsequently analysed regarding the consequences in formation of the archaeological context and archaeological interpretation of household data.

*Brown, Clifford T. (Tulane)*

[57] PROBLEMS IN THE METHODOLOGY OF ETHNOARCHAEOLOGY

In this paper, I argue that the proper conduct of ethnoarchaeology entails the use of ethnographic methods, especially participant-observation. Drawing on my own ethnoarchaeological fieldwork for example, I point out how the behavior required during collection of ethnoarchaeological data tends to conflict with the social role adopted by the participant-observer. I then explain how this and related methodological problems arise from research design and how they may be mitigated by different approaches to the planning of research.

*Brown, James A. (Northwestern)*

[75] MORE MYSTERY FROM THE SPIRO SITE

The historical position of the Spiro site takes on new dimensions as a consequence of a thorough reanalysis of the grave lots. The identification of time sensitive artifacts has clarified the structure of the domain of disposal of the dead. This advance in understanding has brought to light hitherto hidden cultural and historical complexities. From this analysis and other sources of information, it appears that (1) the site shifted direction of dominant cultural interaction twice in its history, and (2) the artifact-rich graves of the Spiro Phase owe their mass of wealth to grave robbery of earlier phases.

*Browne, D. (see Silverman, H.) [77]*

*Bruhy, M. (see Peters, G.) [52]*

*Brumfiel, Elizabeth S., David Schafer (Albion) and Tamara Salcedo (Instituto Nacional de Antropología e Historia, Mexico)*

[64] THE LIP PLUGS OF XALTOCAN: SYMBOLS IN ACTION AND SYMBOLS IN PRACTICE

Fifty-five obsidian lip plugs were recovered from Middle and Late Postclassic contexts at Xaltocan, Mexico. Ethnohistorical documents suggest that obsidian lip plugs served as ethnic markers distinguishing the Otomi from other ethnic groups in the Valley of Mexico. Xaltocan's lip plugs are analyzed within the paradigms of Marxist archaeology and contextual archaeology. Several issues are examined. What archaeological evidence would enable us to identify these lip plugs as ethnic markers in the absence of documentary evidence? How can we establish their meaning? How can we establish their function? How does this relate to broader issues of social transformation?

*Bryant, Jr., V. M. (see Shafer, H. J.) [28]*

*Bryant, Jr., V. M. (see Sobolik, K. D.) [28]*

*Buchsenschutz, Olivier (CNRS)*

[16] THE SIGNIFICANCE OF MAJOR SETTLEMENTS IN IRON AGE SOCIETY

Although large fortified settlements appeared in Temperate Europe towards the end of the Bronze Age, they attained the status of capitals of civitates very gradually. Some show clear evidence of internal planning, but lack indications of public buildings. The emergence of Hallstatt-period citadels seems to have derived from the power of individual aristocrats. Contrastingly, political power in Celtic Italy was retained by a rural-based upper class. With agricultural stores and burgeoning artisanal sectors enclosed by monumental walls of traditional type, oppida were the first centers to witness power struggles amongst aristocrats, tyrants, entrepreneurs, and representatives of the new political order.

*Bungart, Peter W. (Northern Arizona)*

[05] LATE ARCHAIC EXPANSION IN THE UPPER GLEN CANYON REGION, SOUTHEASTERN UTAH

Recent survey and testing of open sites in the upper Glen Canyon area indicates a notable increase in occupation during the Late Archaic period. Paleoenvironmental research on the Colorado Plateau and Great Basin, focused primarily on plant macrofossils, suggest that this increase may have been influenced by more favorable conditions in upland areas, including the expansion of the pinyon zone. C-14 hearth dates imply that a hunter-gatherer strategy persisted in the area as late as ca. AD 400, substantially later than the adoption of agriculture in Anasazi areas to the south and east.

*Bunker, Cindy J. (Museum of New Mexico)*

[15] ARCHAEOLOGY IN THE LARGO-GALLINA REGION: THE LAST 70 YEARS

Located along the Continental Divide in north-central New Mexico is a culture known as the Largo-Gallina. These people appear to have developed a fairly complex agrarian society which flourished

between A.D. 1000 and 1300. Hundreds of sites consisting of diverse types have been identified and studied over the last 70 years. Well known archaeologists such as H.P. Mera, Frank Hibben, Florence Hawley Ellis, and Herb Dick, to name a few, have conducted various forms of investigations ranging from in-depth ceramic studies to excavations. This paper presents an overview of the work of these and other researchers.

**Burchett, Timothy (Northern Arizona)**

[73] ARCHITECTURE AND SOCIAL ORGANIZATION AT WUPATKI PUEBLO

Wupatki Ruin is a 12th century pueblo located in the Wupatki Basin of northern Arizona. A reanalysis of original excavation data from this site was performed to suggest the nature of social organization present. The analysis uses architectural features to infer use of specific rooms. Interactive variables include room size, story, location, number, and kind of wall openings, and floor features. Three basic room functions are recognized: habitation, storage, and ceremonial. Population estimates are suggested from room size, and household boundaries are determined by room use and wall openings.

**Burgett, Galen R. (New Mexico) and James G. Enloe (Laboratoire d'Ethnologie Prehistorique)**

[39] BEASTS AND BURDENS: PACKAGE SIZE DETERMINANTS IN DIFFERENTIAL BUTCHERING PATTERNS

Package size differences in various prey species may determine different butchering tactics by hunters and gatherers. These variable carcass reduction tactics are also influenced by season, group size, transport, and storage contingencies. Patterns derived from observations of anatomical element representation, butchering marks, and breakage patterns on Bison bison and Ranifer tarandus are presented to demonstrate facets of differential processing according to prey size. Variability in butchering tactics can be demonstrated by analysis of materials from Great Plains Protohistoric and European Upper Paleolithic sites and compared to ethnoarchaeological control situations.

**Burnett, Barbara A. (Arkansas)**

[75] THE BIOLOGICAL CORRELATES OF CULTURAL ADAPTATION IN THE ARKANSAS RIVER BASIN

A bioarchaeological synthesis, including 844 individuals representing the Woodland and Mississippi periods, has been conducted in the Arkansas Basin. Bioarchaeological evidence indicates: 1. no skeletal group before the Fort Coffee phase exhibits caries rates indicating maize agriculture; 2. upland populations consistently show greater utilization of carbohydrates than lowland groups; 3. the frequency of skeletal infections also fluctuates by geographic region. The patterning of subsistence-related data and paleoepidemiological indicators shows consistent differentiation between upland and lowland populations, suggesting that ecological variability had a profound impact on prehistoric inhabitants of the Arkansas drainage.

**Burnside, Carla D. (BLM)**

[07] UPLAND MODOC VILLAGE SITES ASSOCIATED WITH WETLANDS

Research near Gerber Reservoir, south-central Oregon, has concentrated on upland Modoc sites. A transhumant pattern of movement from spring throughout fall is implied in the ethnographic literature; however, a pattern of logistic mobility from a strategic location seems more likely. Fifteen village sites are clustered around an open basin that was an extensive wetland with small ponds providing habitat for fish and wildlife. Bones of fish and of waterfowl, and freshwater mussel shells have been recovered and show the use of wetland resources. The degree of sedentism was determined by the nature and distribution of upland wetland resources and the logistical strategy.

**Burton, James H. (Wisconsin-Madison)**

[63] BARIUM AS A PALEODIETARY INDICATOR

Barium levels in bone, like strontium levels, reflect dietary inputs and indicate trophic level. Barium in the terrestrial environment is approximately as abundant as strontium, but barium in seawater is less than strontium by several orders of magnitude. Thus the ratio of barium to strontium in bone is a sensitive indicator of the relative contributions of marine and terrestrial dietary components. Trace-element data from hundreds of archaeological samples from more than a dozen sites confirm that this dietary sensitivity is preserved in fossil bone.

**Burton, J. H. (see Linse, A.) [43]**

**Butler, Virginia L. (Washington)**

[32] THE DALLES ROADCUT SALMON BONES: NATURAL OR CULTURAL?

The 7500–9500 yr. old Dalles Roadcut site, Columbia River Oregon, produced over 125,000 salmonid remains and has represented the best evidence for early Holocene fishing in the Pacific Northwest

since excavated in the 1950s. Recently the cultural origin for the fish bones has been challenged. Given the significance of the deposit to regional prehistory, its depositional origin needs clarification. Control samples from natural and cultural contexts have been analyzed in terms of element survivorship and skeletal completeness to develop criteria to distinguish natural from cultural salmonid remains. These criteria are applied to The Dalles deposit to determine its origin.

**Butterworth, K. R. (see Orr, M. R.) [61]**

**Byland, B. E. (see Pohl, J.) [02]**

**Byrd, Brian (Wisconsin-Madison)**

[55] LATE PLEISTOCENE VARIABILITY IN THE EASTERN JORDAN DESERT

Emerging patterns of Late Pleistocene settlement in eastern Jordan are examined based primarily on the results of the Azraq Basin Project. Consideration is given to variability in the physical characteristics of the occupation horizons, site structure, non-local resources, and chipped stone assemblages. Shifts in patterns of settlement intensity and organization between the Late Upper Paleolithic and the Late Epi-Paleolithic are hypothesized and regional implication are discussed.

**Cable, John (Soil Systems, Inc.)**

[20] FACTORS INFLUENCING EARLY HOHOKAM VILLAGE FORMATION IN THE PHOENIX BASIN, ARIZONA

Current models of early Hohokam settlement and village formation stress a protracted and gradual transition from highly mobile, hunter-gatherer to sedentary, agrarian land-use systems. However, new evidence is emerging which suggests that the transition was quite rapid and that sizable villages exhibiting internal segmentation and community integrative features were forming as early as A.D. 300. This paper reviews the new evidence and identifies a number of factors that may have influenced the relatively abrupt appearance of sedentary farming communities in the riverine environments of the Sonoran Desert.

**Cabrera C., R. (see Cowgill, G. L.) [51]**

**Cagle, Chantal (UC-Santa Barbara)**

[22] POTTERY PRODUCTION IN IRON AGE ENGLAND: RESULTS OF ICP ANALYSIS

Results of research into the organization of the production of Glastonbury Ware, a type of decorated pottery in widespread use in the Late Iron Age in Southwest England, are reported. Chemical analysis, using the Inductively Coupled Plasma Emission Spectrography, was combined with traditional form and design analyses to determine whether the production of Glastonbury Ware was a specialized industry, as suggested by previous petrological research.

**Cohen, D. (see Keeley, L. H.) [70]**

**Callow, Paul (Cambridge)**

[81] THE ARCHAEOLOGY OF THE MARGINAL: THE ZAGROS PALEOLITHIC

In recent years, work in cool-temperate latitudes has investigated the fragility of human presence and highlighted the subtle interplay of factors influencing Paleolithic habitation and its viability in environmentally unstable or extreme areas. These may be marginal (though productive, intermittently) in the longer-term view, but are by no means peripheral for archaeologist. With evidence of occupation at high altitude (cf. Houmian ca. 2000m in the Middle Paleolithic), Zagros prehistory was as open to constraints and opportunities as were Tasmania, southern England, or the European Alps. Does available evidence mirror events elsewhere, and what avenues of future research are suggested?

**Cameron, Catherine M. (Arizona)**

[56] STRUCTURE ABANDONMENT AT A HOPI PUEBLO

Historic photographs and maps are used to examine change in structure function and structure abandonment at the Hopi Pueblo of Old Oraibi. A tentative measure of the pace at which architectural change typically occurs in Southwestern pueblos is suggested and social factors causing deviation from this pattern are explored. An understanding of functional change and abandonment of structures has important implications for many areas of archaeological interpretive methodology, especially the estimation of prehistoric population.

**Campbell, Sarah (Western Washington)**

[48] HOW WIDE THE RIPPLES?: THE CASE FOR EARLY 16TH CENTURY EPIDEMICS IN NONAGRICULTURAL WESTERN NORTH AMERICA

Dobyns has hypothesized an early 16th century panhemispheric smallpox epidemic throughout the densely settled, agricultural areas of the Americas and hesitantly suggested extensions of these epidemics into the nonagricultural areas of Western North America. This view runs counter to

traditional interpretations in regional literature that disease was an 18th century introduction in the Intermontane West. Arguments advanced against pre-18th century epidemics in the Pacific Northwest are examined and found to have serious logical flaws. Further, archaeological data from the Columbia Plateau suggest an early 16th century epidemic in that region.

*Cande, R. (see Lafferty, R.) [22]*

*Cannon, K. P. (see Connor, M. A.) [30]*

*Cannon, W. J. (see Hattori, E. M.) [07]*

*Canouts, Veletta (National Park Service)*

**[66] THE NATIONAL ARCHAEOLOGICAL DATABASE: "PUNCTUATED EQUILIBRIUM"**

NADB-REPORTS, the expanded bibliographic portion of the National Archaeological Database, has developed in tandem with advances in microcomputer technology. While solving problems associated with size of the database or data transfer, technological "fixes" often strain the system. The initial design of the system was based on certain assumptions about the way that data in NADB-REPORTS would flow and be accessed. As users begin to access and query the database, their demands will also strain the system. The dynamic interplay of user needs and technological accommodations ensures that the design of NADB-REPORTS will evolve in the 1990s: How manageable is the change?

*Canouts, Veletta (National Park Service) [Discussant 08]*

*Canul, G. E. (see Ringle, W. M.) [12]*

*Caramelas, Kristopher R. (South Carolina) and Shelly Raven (Intermountain Research)*

**[47] DON'T QUARRY, BE HAPPY! ACTUALISTIC QUARRYING AND ITS IMPLICATIONS FOR SOCIAL ORGANIZATION AT TOSAWIHI QUARRIES, NORTHERN NEVADA**

*Caramelas, K. R. (see Peterson, J.) [47]*

*Caran, S. C. (see Neely, J. A.) [51]*

*Caran, S. C. (see Peterson, J. A.) [47]*

*Carmack, Robert M. (SUNY-Albany)*

**[01] CULTURAL TRADITIONS AND ECONOMIC FACTORS IN THE CONQUESTS OF GUATEMALA AND COSTA RICA**

The Spanish conquest of Central America differed widely according to whether or not indigenous societies were participants in the Mesoamerican cultural tradition, and whether the resources of a given area were of economic interest to the Spaniards. These two factors are explored through a comparison of the conquests of Guatemala and Costa Rica, two areas known to differ both in indigenous culture and economic attraction for the Spaniards. To aid the assessment of these two factors, a more fine-grained comparison will be made of the conquest process in two communities, Momostenango, Guatemala, and Buenos Aires in Costa Rica.

*Carmeau, Kelli (Pittsburgh)*

**[12] ARCHITECTURAL LABOR INVESTMENT AND SOCIAL STATUS AT SAYIL, YUCATAN, MEXICO**

This paper examines architectural variability within the residential platform/household groups at Sayil, using labor investment figures as an initial means of categorizing the variability. The size and quantity of several architectural features are monitored for their patterns of variation. A rank order of labor investment is achieved, and a social status hierarchy is presented for the residential area of Sayil (Terminal Classic A.D. 800–1000). This discussion is placed in the context of Maya land tenure systems. It is argued that large, wealthy households were 'first founder' families in the Sayil valley and thus could effectively control and monopolize land and other productive resources including labor, for their own advantages.

*Carr, Christopher and Jean-Christophe Komorovsky (Arizona State)*

**[22] IDENTIFYING CERAMIC TEMPER MINERALOGY WITH X-RADIOGRAPHY: ADVANTAGES AND LIMITATIONS**

New methods and materials for industrial and medical X-radiography allow the approximate mineralogy of rock temper particles to be identified in ceramics without their destruction. The broad classes of felsic, mafic, and opaque minerals can be distinguished consistently, as well as certain specific mineral contrasts. Standard petrographic traits of crystal mineralogy, along with the grey level of the particle's image relative to that of the clay matrix, are used to make the identifications. X-radiographs

can be used economically to survey the broad mineralogical variation of a large population of sherds and to develop mineral sampling strata for finer-grained petrographic analysis.

*Carrasco, David (Colorado-Boulder)*

**[64] GIVE ME SOME SKIN! THE IMAGE AND REDISTRIBUTION OF THE AZTEC WARRIOR**

Transformation and metamorphosis appear as a pervasive pattern in Aztec ceremonial life. Even static structures such as stones, temples, and sculptures were decorated to display information about the dynamics of religious imagination and political power. This paper will focus on several stone images depicting flayed skins to describe and interpret the political and metamorphic meaning of human skins.

*Cartledge, Thomas R. and Patricia M. Spoerl (USFS)*

**[52] DISCOVERING THE PAST: THE INTERFACE BETWEEN LINKING RESEARCH AND PUBLIC INTERPRETATION**

The National Forests of New Mexico and Arizona have recently implemented a program of cultural resource interpretation based upon a philosophy of "discovering" the past. It is a multi-tiered approach that will provide a wide range of opportunities for the public to gain an understanding and appreciation not only of archaeological resources but of the goals and relevance of archaeology itself. Citing specific examples, an argument is presented that interpretation should not be merely a resource management exercise. Successful public interpretation is both dependent on the supportive of scientific investigations to identify and explain the events and processes that shaped the past.

*Charles, Douglas K. (Wesleyan)*

**[69] SOCIAL FACTORS IN THE MIDDLE TO LATE WOODLAND TRANSITION IN WESTCENTRAL ILLINOIS**

In westcentral Illinois, the Middle to Late Woodland transition is marked by the disappearance of elaborate mounds and regional exchange, expansion and homogenization of ceramic style zones, and smaller housefloors and resource territories. Coevolutionary models suggest a process of "tribalization", not a "decline of Hopewell". Examination of diachronic settlement distributions of groups aggregating in the Illinois Valley during the Middle Woodland period suggests that Hopewell and Middle Woodland characteristics are the reflection of elite "lineage" competition and interaction during the aggregation. Their disappearance or modification reflects subsequent solidification of regional kinship networks ("tribalization"), which replaced the elite-based network(s).

*Charlton, Cynthia L. Otis*

**[50] FIGURINE AND LAPIDARY PRODUCTION AT OTUMBA: CRAFT SPECIALIZATION IN DOMESTIC CONTEXTS**

Surface surveys and collections at Otumba (1987–1988) located barrio-like concentrations of debris from figurine and lapidary workshops. Excavations in 1988 and 1989 explored a figurine and a lapidary workshop, each within a domestic residence. Figurine production was associated with the manufacture of minor clay artifacts (marbles, wheels, censers). Lapidary output included earspools, and labrets, of local and imported obsidian and rock crystal, points and blades of obsidian and chert, and lapidary tools of obsidian, chert and basalt. This wide range of products from household contexts indicates a broad production strategy.

*Charlton, Thomas H. (Iowa)*

**[50] ECONOMICS AND POLITICS: THE CASE OF AZTEC OTUMBA**

Otumba reached its political and economic apogee during the Late Horizon (ca. 1400–1520). Archaeological evidence of these interrelated developments is found in the construction sequence within the nucleated core of TA-80, the elaboration and intensification of floodwater irrigation in the middle valley alluvial plain, the extent and volume of specialized craft production at TA-80 and immediately adjacent sites (groundstone, obsidian core-blade production, fiber spinning, figurine molding, and lapidary work), and the distribution of ceramics within Otumba and its dependent sites. These data confirm a Late Horizon pattern of regional variability in city-state economic and political development in the basin of Mexico.

*Chase, Philip G. (Pennsylvania)*

**[67] MOUSTERIAN BEHAVIOR, TAPHONOMY, AND THE "BONE BED" OF LA QUINA, SOUTHWESTERN FRANCE**

Locus 2 at the Middle Paleolithic site of La Quina (Charente, France) was a very dense but spatially limited concentration of ungulate bones. By testing for the archaeological correlates of all probable human and taphonomic factors in the accumulation of the bone bed, we were able to identify the factors involved in its origin. Human activity was the main agent of accumulation. However, for no

hypothesized factor were all the test implications met. Rather, the superposition of multiple taphonomic patterns on the original assemblage have obscured the exact nature of human activity.

*Chatters, James C. (Battelle Northwest)*

[32] CLIMATIC COOLING AND THE DEVELOPMENT OF COLLECTOR STRATEGIES ON COLUMBIA PLATEAU

Studies of adaptive strategies among ethnographic hunter-gatherers indicate that logically mobile, storage-based "collector" strategies characterize northern latitudes, whereas nonstoring, residentially mobile "forager" strategies typify warmer regions. Between 6000 and 3000 yr B.P. on the Columbia Plateau a highly-residentially mobile foraging adaptation is replaced first by periodically-sedentary foraging, then by archetypical, logically-mobile, storage-based, collecting. Paleoecological data is examined in detail for a possible climatic trigger, with special attention to the resource productivity and seasonality. Results show that increasing moisture ca 5000 yr B.P. improved productivity of local food resources, then neoglacial cooling restricted resource accessibility, stimulating reduced mobility and, finally, storage-based collector adaptations.

*Cheek, Annetta L. (Office of Surface Mining)*

[26] INTRODUCTORY REMARKS

The Society for American Archaeology has become increasingly alarmed at the rate the archeological resource base of this country is diminishing due to vandalism, looting and erosion. If we cannot successfully combat this problem, we will be reduced to pursuing our profession from arm-chairs or in museum basements. Since we are so few, it is imperative that we pursue cooperative ventures with other interested groups, or we will not be successful in saving the past for the benefit of future archaeologists and the public. The plenary session's participants will discuss various perspectives on developing successful coalitions with other organizations and the need for educating the American public on the value of protecting our cultural heritage.

*Cheek, Annetta L. (Office of Surface Mining) and Loretta Neumann (CEPH, INC.)*

[13] THE SAA'S SAVE THE PAST FOR THE FUTURE PROJECT

Approximately two years ago, the Society began an important new initiative—the Save the Past for the Future Project. Although the Society has long been involved in a variety of anti-looting and site preservation activities, this project signifies the Society's recognition that a concerted effort must be mounted if the increasing destruction of our archaeological heritage is to be reversed. This presentation will focus on the organization of the project, the significant events that have happened to date, and the role of the individual professional in this important effort.

*Christensen, Christine (USFS)*

[13] UNDERSTANDING AND CONTROLLING VANDALISM AND DESTRUCTION OF CULTURAL RESOURCES

This presentation will identify issues which contribute to our understanding and ability to control looting and vandalism to archeological sites. Participants at the SAA's anti-looting conference identified five topics for consideration: (1) role of the archeological profession; (2) role of the perpetrator; (3) role of the land manager; (4) role of the public; and (5) legal issues. Each group has its own motivations and requires a separate strategy to solve the problem. For example, six different types of perpetrators were recognized—the professional looter, intensive collector, casual collector, defacer, and instigator. Five action plans were developed by the participants; each will be discussed briefly.

*Ciolek-Torrello, Richard S. and Jeffrey H. Altschul (Statistical Research)*

[35] PREHISTORIC EXPLOITATION OF A SOUTHERN CALIFORNIA COASTAL LAGOON

Excavations at the Admiralty Site (CA-LAn-47) recovered substantial quantities of subsistence-related and paleoenvironmental data. The site is located on the former Ballona Lagoon in what is now Marina del Rey. The immediate environment shifted in response to changes in flow regime of the Los Angeles River. Artifact analyses suggest the site was occupied briefly during the Late Prehistoric Period. Results to date concerning subsistence practices will be presented and compared with nearby assemblages on the Del Rey Hills.

*Cisowski, Stan (UC-Santa Barbara) and Jonathon E. Ericson (UC-Irvine)*

[68] A TEST OF CONTEMPORANEITY OF FEATURES AND SITES WITHIN THE IRVINE COAST BY ARCHAEO MAGNETIC DATING

Archaeomagnetic data can be used to determine the ages of nearby hearths to ascertain if they could have been in use at the same time. A direct spin-off of this research is the creation of a much-needed archaeomagnetic dating curve for California. Pole positions were obtained from baked soil and fire-affected rock from hearths which radiocarbon data indicate date to circa AD 1400. The magnetic pole

positions are similar to those from the Southwest for this time period, but are also similar to the present magnetic pole position, indicating the need to a curve for California.

*Clark, Jeffrey (North Dakota State)*

[84] SETTLEMENT AND SUBSISTENCE IN LEEWARD HAWAII ISLAND

The environmental conditions of leeward and windward Hawaii Island differ significantly. Correspondingly, there are differences in the settlement and subsistence systems that developed in each region, and there is variability even within each of those zones. The patterns of economic production and settlement in leeward Hawaii Island are discussed in terms of issues such as chronology of settlement and expansion, coastal versus inland settlement, paleodemography, agricultural technology, and trade.

*Clark, John (New World Archaeological Foundation) and Michael Blake (British Columbia)*

[09] THE DEVELOPMENT OF EARLY FORMATIVE CERAMICS IN THE SOCONUSCO, CHIAPAS, MEXICO

The first ceramic vessels and figurines found in Chiapas date to the Barra phase (c. 1800 BC, calibrated). Changes in vessel forms and figurine styles are traced over a 1000-year period. Changes in early ceramic complexes are linked to socio-political developments. A model is presented to explain the emergence of ceramic technology in the Soconusco region.

*Clark, N. (see Wise, K.) [25]*

*Close, A. E. (see Wendorf, F.) [86]*

*Cody, Annie (Foundation for Field Research/San Diego State)*

[62] SPECIALIZATION, INTERACTION, AND EXCHANGE: A PERSPECTIVE FROM THE SALAOID SITE OF PEARLS, GRENADA, W.I.

Spatial and temporal distributions of pottery indicate that the Saladoid peoples of mainland South America colonized the islands of the West Indies in the first centuries B.C. and A.D. Recently excavated artifacts from the site of Pearls on Grenada provide evidence for Saladoid importation of exotic lithic (nephrite, amethyst, and others) from the mainland to the island, as well as for specialization in the production of ornaments at the site. The significance of these data for reconstructing the long-distance exchange network and for understanding sustained island-mainland and inter-island interaction by the Saladoid peoples is examined.

*Cole, Sally J. (Independent)*

[44] ROCK ART EVIDENCE OF THE PRESENCE AND SOCIAL SIGNIFICANCE OF THE KATSINA CULT AT THIRTEENTH—FOURTEENTH CENTURY HOMOL'ovi

Rock art approached from the contexts of historic Pueblo katsina iconography and katsina cult symbols provides archaeological evidence of the presence and social significance of the katsina cult at prehistoric Homol'ovi ruins. Structurally identified katsina iconography of the Hopi and Zuni is comparable to rock art in the vicinity of Homol'ovi ruins, and comparisons with Southwest iconography from rock art and material culture generally date homol'ovi katsina iconography to the thirteenth through fourteenth centuries A.D. The use of historic katsina symbolism, its content, organization, visibility, and distribution, provides information whereby the social significance of the katsina cult at Homol'ovi can be measured.

*Collis, John (Sheffield)*

[16] STATES WITHOUT CENTERS? THE MIDDLE LA TENE PERIOD IN TEMPERATE EUROPE

The Middle La Tene period (350–150 BC) represents a problem in the social development of Iron Age temperate Europe. It lacks the wealthy burials of the preceding periods, or the centralized defended sites that develop immediately afterwards. There is little evidence for trade or prestige goods. This paper will explore recent evidence for the economic and social reconstruction of the period, including specialist production and cult centers.

*Connor, Melissa A. and Kenneth P. Cannon (National Park Service)*

[30] FOREST FIRES AS A SITE FORMATION PROCESS IN THE ROCKY MOUNTAINS OF NORTH-WESTERN WYOMING

In the Wyoming Rocky Mountains, forest fires are an important part of the ecosystem and almost all archaeological sites have been subjected to natural burns. The 1988 fires in the Yellowstone area allowed us to examine the effects of fire on the deposition and formation of archaeological sites in the area. Important site-level effects include (1) the mosaic burn pattern, where sharp boundaries are present between burned and unburned areas, (2) morphological changes to stone or bone should be limited to within several centimeters of the burn layer, (3) specific oxidized soil features, and (4) ash pockets.

*Cook, Anita Gwynn (The Catholic University of America)***[77] THE MIDDLE HORIZON OCCUPATION OF THE ICA VALLEY, PERU**

Settlement survey data of the lower Ica Valley, Peru, suggest a two phase penetration of highland cultural traits in the region. The early phase is closely related to the demise of Nasca society. The later phase reveals that Huari presence was relatively brief and concentrated in specific sub-regions where there are abundant remains of metallurgy and ceramic production activities. Inferences are drawn concerning the relationship between local populations and the role of the Huari in the Ica Valley.

*Cooke, Richard G. (Smithsonian Tropical Research Institute) and Patricia Hansell (Temple)*

**[09] EARLY POTTERY IN CENTRAL PANAMA**

The earliest pottery style, Monagrillo (2800–1000 BC), is found from the Cordillera to the Pacific coast, stratified above Preceramic components. It is remarkably conservative in style and technology, but new studies at stratified shellmounds have identified diachronic and regional variation. By 800 BC, new styles evolve rapidly, probably in response to the greater demand for fine wares at increasingly sedentary villages. This paper examines these developments in the light of endogenous and exogenous development.

*Cordell, Linda S. (New Mexico) [Discussant 59]*

*Cordy-Collins, Alana (San Diego/Museum of Man) and Ann Hutflies (Duke)*

**[77] WARI RITUAL SPACE AT PIKILLACTA, PERU**

Excavations at the Wari site of Pikillacta have revealed six examples of a building type whose special purpose seems to have been ritual activity. All are large rectangular fieldstone constructions which open onto a spacious courtyard. Upon a building's completion, sumptuous offerings—including human interments, copper objects, and Spondylus shells—were placed near its four rounded interior corners. These data are interpreted to suggest that rituals here were large and public, and that they were integral to Pikillacta throughout its occupation. Indeed, at least one of the buildings was in its final construction phase when the site was abandoned.

*Coupland, Gary (Toronto)*

**[22] THE POINT GREY SITE: A SPECIAL ACTIVITY COMPONENT OF THE MARPOLE****CULTURE IN SOUTHWESTERN BRITISH COLUMBIA**

Results of excavations at the Point Grey Site in 1986 and 1988 are presented. Faunal analysis suggests that the site was a specialized herring fishing camp. But other lines of evidence—large, permanent structures, burials, ceremonialism, and a large, diversified tool assemblage—are more consistent with a village occupation. Shellfish seasonality evidence points to a late winter-early summer occupation. The implications of this evidence for Marpole settlement patterns are discussed.

*Couture, Nicole (Chicago)*

**[77] TYPE F: A NEW STRUCTURAL TYPE AT THE WARI SITE OF PIKILLACTA**

Architectural data recently uncovered during the extensive excavation of an elite status structure at the Wari site of Pikillacta in the valley of Cuzco, Peru, are discussed. 1. A "new" type F architectural unit has been identified, 2. patterns of access and circulation within the site have been clarified, and 3. new evidence concerning construction methods has been found.

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

**[69] SOCIAL IMPLICATIONS OF OHIO HOPEWELL ART**

Ohio Hopewell art has excited the imagination of scholars since the mid-nineteenth century. The diversity of symbols, and the exotic materials used in their manufacture is unsurpassed in North American prehistory. Although it may be impossible to interpret the explicit meaning of various symbols, this paper interprets Hopewell art through its ability to transmit information. Three kinds of symbols are recognized: 1) personal symbols whose meaning may have been known only to their owner; 2) symbols whose meaning was known to Hopewell lineages or clans; and 3) standardized symbols whose meaning was known to all members of Hopewell society.

*Cowgill, George L. (Brandeis), Ruben Cabrera C. (Instituto Nacional de Antropología e Historia) and Saburo Sugiyama (Brandeis)*

**[51] EARLY TEOTIHUACAN RULERSHIP: NEW EVIDENCE FROM THE FEATHERED SERPENT PYRAMID**

The Feathered Serpent Pyramid is at the heart of the Ciudadela, the political and symbolic focus of Teotihuacan. Recent excavations, especially in 1988–89, reveal a complex pattern of sacrificial burials outside and inside the pyramid, involving well over 100 individuals, almost surely accompanying an important ruler, around A.D. 200–300. Dedicatory sacrifice on this scale affects our view of the early

Teotihuacan state. An extensive looter tunnel, probably dug not long after the pyramid was completed, suggests a dynastic change and is consistent with other evidence for a marked shift in the nature of political control, probably before A.D. 400.

*Crabtree, Pam J. (Princeton)*

**[29] THE USE OF ENVIRONMENTAL SPACE IN EARLY ANGLO-SAXON ENGLAND: THE ZOOARCHAEOLOGICAL EVIDENCE**

This paper will examine the use of environment by the early Anglo-Saxon (5th–7th century A.D.) settlers in eastern England. The Breckland region in East Anglia, which was heavily settled in early Saxon times, included a range of environmental zones—river bottoms, terraces, slopes, and uplands—which could be used for different subsistence activities. The analysis will be based primarily on zooarchaeological data which provides evidence for use of the different environmental zones for animal husbandry and hunting. The faunal data are drawn primarily from the extensive excavations at the early Anglo-Saxon settlement distributions and these ecological zones will also be considered.

*Crane, Cathy (Southern Methodist)*

**[02] PALYNOLOGICAL RESEARCH AT CERROS, BELIZE**

Archaeological pollen samples collected from sealed midden deposits at Cerros, a Late preclassic Maya community, were used to reconstruct vegetational history of the site. Quantitative studies of present-day plant associations and modern pollen analog samples were used to calibrate the archaeological pollen data. If the archaeological and modern pollen assemblages were similar in their pollen composition and proportions, it was concluded that they were produced by similar types of plant associations. The pollen data were also integrated with the Cerros archaeobotanical assemblage to provide a more complete record of the inhabitants' utilization of wild plants and cultigens.

*Creel, Darrell (Texas-Austin)*

**[80] THE 1989 EXCAVATIONS AT THE OLD TOWN RUIN, LUNA COUNTY, NEW MEXICO**

In 1989, Texas A&M University conducted test excavations at the Old Town Site for the Bureau of Land Management. Although the Classic Mimbres and Black Mountain Phase ruins at Old Town have been extensively looted, intact deposits and architecture from each occupation are still present. Pit structures and associated Late Pithouse Period remains were located and found to be in relatively good condition. A deep midden deposit was tested and yielded a well-stratified sequence of Late Pithouse Period and Classic ceramics and other artifacts.

*Creger, C. Cliff (Nevada-Reno)*

**[61] A STUDY OF PREHISTORIC RESOURCE USE AT DUCK VALLEY, NEVADA**

I will give a poster session on prehistoric resources of Duck Valley, northwest Nevada. Mapping the resources delineates areas where the resources are concentrated and more likely to be utilized. Excavations at the Worland site (26WA3894) demonstrates that plant, animal and toolstone resources were utilized. The work from adjacent valleys and Duck Valley will then be compared.

*Crew, Peter (Snowdonia National Park Study Centre) and Christine Hide (Pennsylvania)*

**[47] PRE-ROMAN IRON PRODUCTION IN NORTH-WEST WALES**

Excavations and field work at upland sites in North-West Wales have produced evidence for substantial iron production from 250 B.C. to 1 A.D., the Pre-Roman Iron Age. Experimental smelting and bloom smelting have provided comparative materials which are being used to quantify and interpret the archaeological evidence. Metallographic analysis is being conducted on a variety of plano-convex slags to test the hypothesis that they represent different stages of the production process. This research contributes data concerning the scale and organization of metal production within the region and within the broader context of North-Western Europe.

*Croes, Dale R. (Washington State) and Steven Hackenberger (Wisconsin)*

**[74] MODELING THE EVOLUTION OF NORTHWEST COAST ECONOMIC DECISION-MAKING: A 9,000-YEAR COMPUTER SIMULATION**

Using computer simulation techniques we model economic patterns over 9,000 years along the southern Northwest Coast of North America. Three main points are considered: (1) exponential human population growth, (2) reconstruction of resource characteristics and behaviors, and (3) human economic decision-making patterns. We project an exponential population growth and estimate that post-glacial coastal regions would become "packed" at a very low population level by 4,000 BP, when resource overexploitation begins in these circumscribed territories. Prior to 4,000 BP, economic decision-making emphasized low-cost aggregations of populations; following 4,000 BP, resource pressures promoted secure-income goals. The archaeological phases/culture types associated with ethnic shifts over the past 9,000 years are reconsidered as economic plateaus separated by short periods of rapid economic change.

*Crotty, Helen (UCLA)*

[44] PROTOHISTORIC ANASAZI KIVA MURALS: VARIATION AS A REFLECTION OF DIFFERING SOCIAL CONTEXTS

Kiva paintings recovered from several protohistoric Anasazi sites in Arizona and New Mexico exhibit considerable iconographic variation. Analysis of depictions of life forms and artifacts in the murals from the various sites shows a strong divergence in subject matter represented. Subjects occurring repeatedly at one site are often absent at others. While variation may be attributed in part to temporal change, iconographic differences in the paintings from contemporaneous sites suggest that kiva murals reflect the values of particular socio-economic-religious groups. Kiva mural art flourished over a wide area between 1300 and 1600, but the inconsistent iconography suggests development in response to local needs rather than a pan-Anasazi phenomenon.

*Crouch, Dora (Stanford)*

[23] ROMAN MODELS FOR THE HISPANIC COLONIZATION OF THE NEW WORLD

This paper discusses the many similarities between Roman colonization of the Mediterranean area during the republican and early imperial periods and Spanish colonization of the New World during the 16th, 17th, and 18th centuries. The writings of Vitruvius on the founding of cities are compared with his 15th century editor Alberti, to see how ancient ideas influenced early Renaissance strategies of city building.

*Crowell, Aron (UC-Berkeley)*

[34] THREE SAINTS BAY, KODIAK ISLAND, ALASKA: RESEARCH DESIGN IN COLONIAL SITES ARCHAEOLOGY

Three Saints Bay was one of the earliest settlements of the Russian-American Company on Kodiak Island and was a very important 18th century site of interaction between the Russian hunters and the native Alaskans of the main part of Alaska. A detailed research design of dissertation study into the nature and effects of Colonial Russian interaction with the Alaskan Native Peoples will integrate archaeological finds with Company documentary description and comments of travelers to develop and test hypotheses in colonial sites archaeology.

*Crown, Patricia L. (Southern Methodist)*

[44] CONVERGING TRADITIONS: SALADO POLYCHROME CERAMICS IN SOUTHWESTERN PREHISTORY

Found over most of the Greater Southwest in the thirteenth to fifteenth centuries, the Salado polychromes were the most widespread pottery types manufactured in the Southwest. The reasons for this widespread adoption of a single pottery technology and style are explored by examining over 800 whole vessels from 72 sites. In attempting to assess the meaning behind designs, associations between motifs, their placement on the vessels, and the continuum from highly representational forms to highly abstract forms are investigated. Contexts in which specific designs occur are also evaluated. Ultimately, the uniformity of the designs found over this broad area suggests greater information exchange and interaction in the late prehistoric period.

*Crumley, Carole L. (North Carolina-Chapel Hill)*

[16] A CRITIQUE OF CULTURAL EVOLUTIONIST APPROACHES TO RANKED SOCIETY, WITH PARTICULAR REFERENCE TO CELTIC POLITIES

The task of integrating the social structure, ecology, and political economy of Celtic society in the half-century before the Roman conquest, while not new, is all the more demanding after nearly a century of analysis by cultural evolutionists. By disassembling the fabric of societies into autonomous units under the purview of specialists, these researchers have masked their fundamental connection. Perhaps most damaging has been cultural evolutionists' importation of mechanical models of social stratification from engineering and business, effectively obviating the role of individuals. Ironically, such predominantly hierarchical models have been replaced in those fields by more flexible and inherently more complex heterarchical structures. Static, hierarchical models embedded in the cultural evolutionist rhetoric of chieftain and state obscure the dynamic social relations among and within Celtic polities for which written accounts and archaeology give us evidence. I offer a scheme by which many of the shortcomings of current analyses may be avoided and integrative, heterarchical, multi-scalar, processual models might be offered in their place.

*Cruz-Uribe, Kathryn (Northern Arizona)*

[67] THE TAPHONOMY OF THE MIDDLE PLEISTOCENE SITE OF ELANDSFONTEIN, CAPE PROVINCE, SOUTH AFRICA

Elandsfontein is a middle Pleistocene open-air occurrence in the southwestern Cape Province, South Africa. The site has provided remains of Acheulean stone tools, numerous animal bones, and

a partial hominid skull attributed to archaic Homo Sapiens. Recent research on the taphonomy of the bovid bones from Elandsfontein is focusing particularly on bone damage and how it relates to the agent and mode of accumulation. Cut marks from stone tools are virtually absent, and porcupine gnawing is present although not extensive. Weathering is conspicuous on the majority of bones. It is likely that the human role in the bone accumulation was negligible, but the site still provides an important sample for comparison with data from other sites where people were definitely involved.

*Cummings, Linda (Paleo Research Laboratories)*

[53] POLLEN/PHYTOLITH EVIDENCE FOR THE TERMINAL PLEISTOCENE/EARLY HOLOCENE ENVIRONMENT OF THE MEDICINE CREEK DRAINAGE, SOUTHWEST NEBRASKA

There are relatively few pollen sequences on the Central Plains which span the period from 12,000 to 8,000 B.P. This paper presents the results of analysis of Late Pleistocene and Early Holocene pollen and phytolith samples taken in conjunction with geomorphic soil research. Data derived from these analyses are integrated with radiocarbon dates, C13/D12 determinations and other data on buried soils in the Medicine Creek drainage to reconstruct regional vegetation patterns and their changes over time.

*Curtin, Edward V. (New York State Museum)*

[04] THE RETURN TO SALVAGE ARCHAEOLOGY

Historic preservation generally has replaced salvage archaeology for good reasons, but the process is imperfect, and requires vigilant attention. Archaeology has suffered from the failure of historic preservation programs to critically or effectively evaluate the premise that "archaeological data recovery" is equivalent to site preservation, or meets the data requirements of modern archaeological research. Recent experiences in New York State suggest not only that significant archaeological sites continue to be endangered, but data recovery may easily replicate the worst conditions of salvage archaeology, including insufficient lead time to complete fieldwork, and lack of accountability for curation, research performance, or reporting.

*Curtin, E. V. (see Sullivan, L. P.) [61]*

*Damp, Jonathan (ESPOL) and Patricia Vargas (Escuela Politecnica del Litoral)*

[09] ALTOMAYO AND REAL ALTO: THE EARLY CERAMICS OF COASTAL ECUADOR

The non-local origins of early Ecuadorian pottery are evaluated in light of Valdivia I ceramics at Real Alto (3500 BC). New excavations at the nearby site of Altomayo indicate a pre-Valdivia period of ceramics experimentation. The chronological, geological, and socioeconomic implications are explored in formulating an in situ hypothesis for the appearance of New World ceramics.

*Dancey, William S. (Ohio State) [Discussant 32]*

*Dansie, Amy J. (Nevada State Museum)*

[07] PREHISTORIC CARNIVORE USAGE PATTERNS IN GREAT BASIN LACUSTRINE SETTINGS

A carnivore usage pattern in the western Great Basin appears to be restricted to lacustrine settings of the Lahontan Basin. Coyote and bobcat bone tubes, wolf, aboriginal Indian dog, wolf-dog hybrids, otter, mink, badger and weasel are found repeatedly in this setting, but are rarely found outside the Lahontan Basin. Distinctive human ecological adaptations to lacustrine settings are hypothesized to explain this pattern, including eliminating local competition for small game while exploiting the naturally abundant carnivores in the lake- or river-marsh environments. The use of dogs to dig out rodents is part of the lacustrine pattern, where marshes are distant from big game habitats.

*Davidson, D. (see Louthan, B. D.) [33]*

*Davidson, William V. (Louisiana State)*

[01] GEOGRAPHICAL PERSPECTIVES ON SPANISH-PECH (PAYA) INDIAN RELATIONSHIPS, NORTHEAST HONDURAS, 1502-1684

The first Central Americans visited by Columbus during his fourth voyage (1502) were the Pech (Paya) Indians of the Bay Islands of Honduras. Over the next two centuries Spanish domination of the islanders and of the Mainland Pech brought population decline, territorial reduction, and economic reorganization. The basic Pech reaction to Spanish pressures was to disperse whenever possible into the headwaters and higher lands that separated the realms of the two major Spanish centers in eastern Honduras, Trujillo (the port) and Olancho (of the interior valley). Both towns were in Pech territory and from them the Spanish church and encomienda reached into Indian lands. Today only 1,200 Pech remain.

*Davis, Craig (National Park Service)*

[66] ISSUES IN DESIGNING AN ARCHAEOLOGICAL RESOURCE MANAGEMENT DATABASE FOR NATIONAL PARKS

The Archaeological Resources Inventory (ARI) database is being developed by the National Park Service as a tool for improving archaeological resource management in National Parks. The design of a management-oriented database for resources in over 350 park units located throughout the United States and its territories presents a variety of challenges. This paper examines major issues being addressed during the development of the ARI, and their resolution (for example: discriminating basic management information requirements from traditional research data sets, resolving data security requirements and the issue of public access, identifying opportunities and constraints for linking or interrelating with other databases, and selecting an appropriate level of user involvement in designing and testing a large "corporate" database).

*Davis, E. Mott (Texas-Austin)*

[53] MEDICINE CREEK, NEBRASKA: INTRODUCTION TO THE SYMPOSIUM

In the decade following World War II, research in the Medicine Creek valley of southwestern Nebraska developed a sequence of Late Wisconsinan and Holocene alluvial terraces, fills, paleosols, and faunas, and also involved the excavation of three post-Folsom Paleoindian camp and workshop sites—Lime Creek, Allen, and Red Smoke—in one of the terrace fills. This paper reviews that work as an introduction to a symposium on recent research that is filling in the earlier work and bringing it up to date.

*Davis, Hester (Arkansas Archaeological Survey)*

[03] TAKING AND GIVING: HOW SUCCESSFUL IS THE FEDERAL EFFORT AT INFORMING THE PUBLIC ABOUT ARCHAEOLOGY?

The 1980 amendments to the National Historic Preservation Act included language indicating that Congress felt it appropriate for federal agencies to provide the public with information about the results of research using public funds. Most federal agencies can provide evidence that they are providing SOME of the public with SOME information. Does a brochure at a project, or a single panel exhibit at a visitor center do the job? What is the percent of funds spent on public information compared to other aspects of historic preservation requirements? What "public" needs to be informed? What is appropriate, in terms of money and products, and what is realistic?

*Davis, Jonathan, Alan H. Simmons (Desert Research Institute), Rolfe Mandel (Nebraska-Omaha), Gary O. Rollefson (San Diego State) and Zeidan Kafafi (Yarmouk)*

[47] A POSTULATED EARLY HOLOCENE SUMMER PRECIPITATION EPISODE IN THE LEVANT: EFFECTS ON NEOLITHIC ADAPTATIONS

Cobble strata at Neolithic 'Ain Ghazal, Wadi Shu'eib, and Abu Thawwab suggest debris flows were triggered by torrential [summer] rainfall, contemporary with an episode of increased Northern Hemisphere summer precipitation. We postulate this scenario: Natufian grain exploitation provided preadaptation to agriculture, which together with summer rainfall, began in the Levant about 10,000 B.P. Population and wealth increased rapidly. But by about 8,000 B.P., summer rainfall ceased and together with overgrazing and deforestation forced separation of herding and cropping lifeways, reduction in wealth, and a shift of intensive agriculture to the river floodplains of Mesopotamia and Egypt.

*Davis, O. K. (see West, G. J.)* [07]

*De Montmollin, Olivier (Toronto)*

[12] PATTERNS OF POLITICAL CENTRALIZATION IN TWO UPPER GRIJALVA BASIN MAYA POLITIES

Settlement attributes are compared for two neighboring Late Classic Maya capitals, Tenam Rosario and Ojo de Agua, to assess political centralization within their polities. Several measures of political centralization are used: whether or not the capital is constituted as a political microcosm of its hinterland, the degree to which elite and commoner settlement are concentrated into the capital, the degree to which settlement is drawn away from boundaries. Results suggest that political centralization was achieved in different ways for each polity, a pattern which is provisionally accounted for by culture-historical factors.

*Dean, Jeffrey S. (Arizona-Laboratory of Tree-Ring Research)* [Discussant 73]

*DeBlois, Evan I. (USFS)*

[52] WINDOWS ON THE PAST: PUBLIC INVOLVEMENT IN CULTURAL RESOURCES MANAGEMENT

As a part of a national effort to focus attention on the untapped opportunities for recreation on the National Forests, the USDA Forest Service has initiated a series of public outreach efforts. "Windows

on the Past" is a program designed to enhance the educational and recreational experience of Forest visitors by developing opportunities to visit, learn about, and participate in archaeological and historical projects. Each National Forest is encouraged to "open a window on the past." This paper will present a national perspective of this program, its goals and objectives, and some of the products and potential products being considered.

*DeBlois, Evan I. (USFS)*

[03] THE USDA FOREST SERVICE'S CULTURAL RESOURCE MANAGEMENT PROGRAM

1990 marks the 20th year of the USDA Forest Service's cultural resource management program. From its beginning the summer of 1970, the program has grown from three archaeologists with a total national expenditure of \$50,000 to a program employing 229 professionals and an annual budget in excess of \$15 million. This paper summarizes the program from a National perspective. A description of the program's organization, goals and methods will be presented along with the program's costs and accomplishments. The effectiveness of the program will be discussed and major problem areas will be identified.

*DeBlois, E. I. (see McAllister, M.)* [13]

*DeBoer, Warren R. (CUNY-Queens)*

[56] ABANDONED HOMES AND BETTER GARDENS: A CASE STUDY FROM THE TROPICAL FORESTS OF ECUADOR

Examination of the history of house movements among the Chachi in a localized area of the Cayapas River, Ecuador indicates that house abandonment results from a complex interplay of geomorphological and social factors including river bank instability, death of a family member, and disputes with neighbors. House movements tend to be localized and often involve the reoccupation of former house sites in alternating generations. Extrapolation of the Chachi settlement pattern over time produces a blurred palimpsest of occupations of relevance to the interpretation of archaeological settlement data.

*Deetz, James J.F. (UC-Berkeley)* [Discussant 60]

*Delacorte, Michael (UC-Davis)*

[42] THE ROLE OF POPULATION IN RELATION TO CHANGES IN THE USE OF ALPINE AND OTHER MARGINAL ENVIRONMENTS IN EASTERN CALIFORNIA

The discovery of late prehistoric high altitude villages in the White Mountains of eastern California and the Toquima Range of central Nevada raises many new questions concerning the stability and uniformity of Great Basin adaptations. Central to these issues is the role of alpine settlements within larger adaptive systems. Work in Deep Springs Valley, California adjacent to the White Mountains suggests that the initial occupation of alpine villages coincides with changes in the use of subalpine environments and more intensive use of resources such as pinyon brought about by a marked increase in regional population at roughly A.D. 600.

*Diamanti, Melissa (Penn State)*

[36] SOCIAL ORGANIZATION OF AN ELITE HOUSEHOLD AT TERMINAL CLASSIC COPAN: TESTING THE DATA AGAINST MODELS

Extensive excavations have revealed the great size and complexity of Group 9N-8, an elite residential compound at Copan. Models for the organization of one hundred or more persons into a single household are derived from different cultures, to generate different patterns of the use of space within a household. The Copan example is found to be closer to the model of kinship-based ties drawn from the Yoruba kingdoms of West Africa, than to the non-kinship model of ties such as alliance or patron-client relationships drawn from the feudal society of Medieval England.

*Dibble, Harold L. and Simon J. Holdaway (Pennsylvania)*

[81] AN ANALYSIS OF THE MOUSTERIAN LITHICS FROM THE SITE OF WARWASI ROCKSHELTER, IRAN

A typological and technological analysis of the lithics from the Mousterian levels at Warwas Rockshelter is presented. The results suggest that typological variability in the Mousterian tools can be explained by a model of continuous tool resharpening. In addition, an interesting temporal trend is revealed which suggests that the degree of tool resharpening steadily increased during the Mousterian occupation. Analysis of the Warwas Mousterian allows comparisons to be made with other known Mousterian assemblages from the Zagros region.

*Diehl, Michael W. (SUNY-Buffalo)*

[61] A CROSS-CULTURAL EXAMINATION OF THE RELATIONSHIP BETWEEN ARCHITECTURE AND MOBILITY

The construction of architectural features is influenced by the purpose for which they are built and the extent for their use. Human mobility conditions purpose, frequency and intensity of use. A cross-

cultural study of ethnographic accounts of 54 societies is used to evaluate the relationship between details of architectural design and characteristics of mobility. Some architectural variables include construction materials, shape and surface area. Frequency and distance of residential moves are the main descriptors of mobility, with additional attention given to duration of use and frequency of reuse of structures.

*Dietler, Michael (UC-Berkeley)*

[16] A COMPARATIVE PERSPECTIVE ON 'CELTIC' SOCIO-POLITICAL SYSTEMS FROM THE 'CELTO-LIGURIAN' PERIPHERY

Central processes in the development of chiefdom and state societies include the institutionalization of informal leadership into political roles, the shift from distributive legitimacy to hierarchical authority, and the merging of multipolarities. Comparative research on 'Celtic' socio-political systems offers excellent potential for addressing these issues and testing the plausibility of social interpretation through analysis of patterns of contrast among interacting societies. Examination of the specific manifestations and contexts of superficially similar elements in Early Iron Age southern France and the classic Furstensitz zone of the Hallstatt region (tumulus burials, hilltop settlements, fortifications, Mediterranean imports) suggests that they represent very different socio-political systems and furthers understanding of processes of political transformation.

*Dietler, M. (see Herbich, I.) [57]*

*Dobyns, Henry F.*

[48] LINKS BETWEEN DEMOGRAPHIC AND CULTURAL CHANGES

Societal cultural complexity is related to populousness. The Columbian Exchange's microparasitic component drastically diminished Native American societal sizes both before and after European colonization. This paper discusses some distinctions between cultural patterns linked and not linked to population magnitude. Discontinuities between pre- and post-Columbian native cultures (and their physical remains) occurred in population-dependent patterns. Continuities occurred in population-independent cultural patterns.

*Dobyns, Susan (Rhodes)*

[60] HOW AND WHY DO HOUSEHOLD CHARACTERISTICS INFLUENCE PATTERNS OF FOOD USE AND DISPOSAL

House sites and households are basic analytical units in much archaeological research. Household characteristics often are inferred from the size, location, construction, or refuse contained within the defined house site. The Garbage Project provides a unique opportunity to compare demographic, interview, and material culture data generated simultaneously for the same set of behaviors at the level of individual households. These data furnish ways to evaluate effects of ethnicity, social status, and family demographics on the cultural and cognitive patterns of food consumption, waste, and disposal.

*Dockall, John and Harry J. Shafer (Texas A&M)*

[70] FUNCTIONAL VARIABILITY AND STONE TOOL CONSUMPTION: AN ANCIENT MAYA CASE FROM SANTA RITA COROZAL, BELIZE

Studies of lithic craft specialization have concentrated largely on assemblages from production sites. However, there is a great amount of complementary information concerning craft specialization that can be gained from sites that represent the consumer end of the tool production/exchange/use cycle. About 90% of the Late Preclassic and Classic formal tools from Santa Rita were manufactured from Colha-area cherts. Formal tools such as oval bifaces and stemmed macroblade were used as axes and multi-purpose cutting implements, respectively. Fragments were recycled into tools for pounding, cutting and adzing. Analyses of the oval biface and stemmed macroblade systems provide evidence of their range of functional variability and technological innovation at a site down the line from the production source.

*Dodge, Andrea Ellis (Florence Hawley Ellis Museum of Anthropology)*

[15] TOWERS OF THE GALLINA AREA AND GREATER SOUTHWEST

Since the 1950s, at the request of Native American Tribes, anthropologists, archaeologists and ethnologists have become involved in cases concerning Indian land and water claims. One result of this involvement is that past customs have been described in greater detail than hitherto had been recorded. In the case of several New Mexico Pueblos, these details included the past and present use of night and day signaling for communication within and between groups. Experimental checking of these techniques verified native statements that messages could be transmitted throughout a network of signal stations, in one case covering 200 miles.

*Dodge, A. E. (see Ellis, F. H.) [15]*

*Dohm, Karen and Lee-ann Hayek (Smithsonian)*

[05] VILLAGE POPULATION ESTIMATION FROM HISTORIC PERIOD PUEBLO DATA

Previously, Pueblos with many tightly clustered apartments have been found to average fewer people per room than Pueblos with fewer rooms and more dispersed housing. This suggested that population estimation could be based on a linear model, as presented here, predicting persons per room by using room counts and architectural aggregation. Using this model, the momentary village population is estimated by multiplying the predicted persons per room (which will vary) with number of contemporaneous rooms. The model uses Historic Period Pueblo data. It is tested by comparing the linear equation describing that data set with another data set of the same Pueblos at different time points.

*Dongoske, K. (see van Hartesveldt, E.) [08]*

*Douglas, John E. (Arizona)*

[33] SETTLEMENT INSTABILITY IN THE LATE PREHISTORIC NORTHERN SIERRA:

IMPLICATIONS FROM THE BOSS RANCH SITE, SOUTHEASTERN ARIZONA

Settlement systems and regional interaction in the late prehistoric Northern Sierra remain poorly understood. Analysis of excavations at the Boss Ranch Site (AZ FF:7:10 [ASM]), an Anasazi phase site in the upper San Bernardino Valley, found three rebuilding phases that may stretch over a 200 year period. Evidence that these occupations were discontinuous and that similar patterns of abandonment occurred at other Anasazi Phase sites is considered. Implications are examined for the reconstruction of regional population densities and settlement hierarchies, as well as for the comprehension of Northern Sierra social interaction.

*Douglas, J. E. (see Brook, R.) [03]*

*Douglass, Amy (Tempe Historical Museum)*

[73] THEORETICAL FRAMEWORKS AND THEIR INFLUENCE ON THE STUDY OF CERAMIC EXCHANGE: A FLAGSTAFF EXAMPLE

Until recently, little research has been directed toward explaining the role of exchange in determining the geographic distributions of prehistoric Southwestern ceramics. Exchange has been largely overlooked as an important distributional mechanism because of the theoretical paradigms and attendant methodologies under which archaeologists have been operating. This paper reviews past approaches to ceramic analysis in the Flagstaff area and discusses how theoretical frameworks have determined which analytical methodologies were employed. A case study is presented to illustrate how extant ceramic collections from the area can be used to locate the source and characterize the exchange system of a ceramic ware.

*Downum, Christian E. (Arizona)*

[73] CLANS, CINDERS, CULTURE, AND CLIMATE: A REVIEW OF EXPLANATION IN FLAGSTAFF ARCHAEOLOGY

The history of explanation in Flagstaff archaeology is chronicled, from the clan-based interpretations of Fewkes to current debates regarding the relative roles of volcanic cinderfall, precipitation, and macroregional culture change. Several distinct intellectual stages are identified, but each is characterized by "plain historical narrative," a rather weak and incomplete form of explanatory sketch. Despite this limitation, it is clear that explanation of Flagstaff prehistory has achieved cumulative success, largely because of increasing archaeological data base has allowed the falsification of specific propositions regarding the form and mechanisms of prehistoric change. Prospects for future explanatory progress are reviewed.

*Downum, C. E. (see Berger, K.) [14]*

*Doyel, David E. (Arizona State) and Stephen H. Lekson (Arizona State Museum)*

[17] REGIONAL ORGANIZATION AND THE CHACO SYSTEM

Conceptual frameworks for Chaco prehistory involve several scales, including the canyon zone, the immediate perimeter, and the surrounding region. The Chacoan region has been seen as a ceramic area, a zone of limited colonization, and as a spatially formalized hinterland for the central canyon settlement. Documented variation weakens existing definitions of the Chaco region based on architectural and ceramic criteria. Recent conceptual thinking about Chaco parallels shifts in archaeological perspectives both in the Southwest and in North America. The history of "Chacoaness" will be explored in view of current configurational approaches including roads, community structures, and interaction networks.

*Draper, J. A. (see Reid, K. C.) [32]*

*Driver, Jonathan C. (Simon Fraser)***[59] REGIONAL VARIATION IN HUNTING STRATEGIES, SIERRA BLANCA, NEW MEXICO**

Faunal assemblages from seven late prehistoric villages in the Sierra Blanca region of eastern New Mexico demonstrate regional variation in hunting strategies. Most hunting was conducted from individual villages, although multi-village aggregations may have conducted communal hunts for pronghorn, and bison meat was probably traded in from outside the region. Major food species were lagomorphs, prairie dogs, deer and pronghorn. Regional variation is primarily expressed in the relative amounts of pronghorn hunted, and this appears to correlate with local availability of grasslands.

*Dublin, S. (see Rothschild, N. A.) [56]*

*Dunham, G. (see Hantman, J.) [69]*

*Dunham, Peter S. (SUNY-Albany)*

**[12] THE SEGMENTARY ORGANIZATION OF THE CLASSIC MAYA OF THE SOUTHERN LOWLANDS**

Several scholars have recently proposed that the Classic Maya of the southern Lowlands were organized in the fashion of segmentary states. A detailed review of the epigraphic record confirms this observation. Aside from showing that Maya polities were numerous and small, in agreement with the segmentary construct, it suggests that they had segmentary structures and increased in number and decreased in size through time as might be expected of a segmentary system under the appropriate conditions. They also followed a developmental trajectory that can best be explained by segmentary processes. Settlement patterns, ceramic spheres, and artistic traditions likewise point to segmentary organization.

*Dunham, Sean (Center for Ancient Studies)*

**[16] VENI, VIDI, ETHNOGRAPHY?: CAESAR AND SOCIO-POLITICAL SYSTEMS IN GAUL**

The perception of "Celtic" socio-political systems has long been affected by the writings of classical authors. An author frequently cited is Julius Caesar whose *De Bello Gallico* provides probably the best contemporary source on Gallic society from the first century before Christ. Caesar describes multiple socio-political systems among the peoples of Gaul. I propose a critical analysis of Caesar's discussion of these socio-political systems, focusing particularly on the nature and context of Caesar's narrative as well as the use of the text by modern scholars.

*Dunnell, Robert C. (Washington)*

**[48] METHODOLOGICAL IMPACTS OF CATASTROPHIC DEPOPULATION ON AMERICAN ARCHAEOLOGY AND ETHNOLOGY**

The catastrophic loss of 90 percent or more of local population in consequence of human disease introductions in the 16th century is more than just another "fact" to be rejected, accepted, or adapted by current interpretive approaches in archaeology and anthropology. Often unwittingly, American archaeologists and anthropologists have taken methodological stances that presume systemic continuity between post- and precontact aboriginal social groups. Such assumptions lack a warrant once the possibility of major depopulation in the 16th century is admitted. Interpretive approaches that depend on systemic continuity are inappropriate and generally and frequently, if not universally, yield false conclusions about native Americans.

*Durand, Stephen R. (Desert Research Institute), Phillip H. Shelley (Eastern New Mexico), Fred L. Nials and Martin R. Rose (Desert Research Institute)*

**[33] TREE SOURCING IN THE SAN JUAN BASIN, INITIAL RESULTS**

An estimated 200,000 trees were used in the construction at Chaco Canyon, ca. A.D. 900–1200. Trees are not present in Chaco Canyon today, and the source of prehistoric trees is a matter of contention. Geochemical procedures have established that trees growing on different bedrock types have different elemental chemistries. Biogeochemical analysis, using ICP spectrometry, was conducted on cores from five tree stands surrounding the San Juan Basin, and tree ring indices were analyzed from each stand to define a regional climatic signal. Results of analyses provide a signature for comparison with archaeological wood samples and identification of potential source areas.

*Dykeman, Douglas D. (Navajo Nation Archaeology Department)*

**[17] ROOM FOR A VIEW: CHACO CANYON FROM THE CHUSKA SLOPE**

As the archaeological data base of the Four Corners Area grows, there is increasing evidence of intensive Anasazi occupations in areas outside of the Chaco core area. Archaeological data, recent and not so recent, from the western periphery of the San Juan Basin indicates a vast network of Anasazi Communities stretching the full length of the Chuska Slope. To some researchers these communities were operating within a vast Chacoan cultural system. This paper rejects this explana-

tion for the wide distribution of supposed Chacoan attributes and offers an alternative view of the origin and development of Chuskan communities.

*Dykeman, D. D. (see Langenfeld, K.) [79]*

*Earle, Timothy K. (UCLA) [Discussant 16]*

*Early, Ann (Arkansas Archaeological Survey)*

**[75] LOOK TO THE SOUTHERN HILLS: LATE PREHISTORIC RELATIONSHIPS BETWEEN THE ARKANSAS RIVER VALLEY AND OUACHITA MOUNTAINS OF ARKANSAS**

Research at the famed Spiro Site and other settlements in the Arkansas River Valley in Oklahoma sought relationships between this region and far flung cultural centers such as Caddo heartland in the Red River Valley and paramount mound centers further east. Research on mound centers in the Ozarks has addressed relationships between the Spiro area and the mountains to the north. Recent information from the Ouachita Mountains southeast of Spiro, however, shows similarities between these two areas in the late prehistoric period and suggests another direction, literally, for investigation of the transformation and eventual decline of Arkansas Valley societies.

*Edens, Christopher (Harvard)*

**[22] AN ARCHAEOLOGICAL LANDSCAPE IN OMAN AND REGIONAL HUMAN ADAPTATIONS**

Archaeological survey in the Ja'alan region of Oman reveals past communities adapted to both coastal and interior conditions. At different times these communities combined hunting-gathering, maritime foraging, pastoralism and farming by seasonal schedules and/or group specialization and exchange to structure a flexible adaptation to this arid landscape. These adaptive responses differentially structured the region according to natural (topography, water, soils, vegetation, etc.) and cultural (subsistence strategies, extralocal political forces, interregional exchange, etc.) conditions. This paper presents a model of changing subsistence strategies and their regional articulation from the early Holocene to recent times.

*Edmonds, Mark (Cambridge)*

**[31] SITUATING THE PRODUCTION AND EXCHANGE OF STONE TOOLS IN THE BRITISH NEOLITHIC**

The view that technology is more open to 'ahistorical' forms of analysis (because it is concerned with the pragmatics of day-to-day existence) continues to be put forward despite recent suggestions that it is precisely at these levels that some of the most basic categories of society may be reproduced. These problems are approached via a discussion of the economics of stone axes during the Neolithic in Britain. It is possible to identify a series of spatial and temporal thresholds across which these artifacts took quite different roles in social practices; they do not simply reflect the appearance and spread of a particular subsistence regime.

*Egloff, Michel (Neuchatel)*

**[86] UPPER PALEOLITHIC ADAPTATIONS AT LAKE NEUCHATEL, SWITZERLAND**

Recent research in the region of Lake Neuchatel, Switzerland, has focused on the changing relationships between lacustrine resources and occupation of the region from Paleolithic through Bronze Age times. Resource distribution and abundance of Lake Neuchatel is considered in light of changing human adaptations to this environment. This topic is addressed relative to Upper Paleolithic hunter gatherer responses to these resources.

*Ellis, Florence Hawley and Andrea Ellis Dodge (Florence Hawley Ellis Museum of Anthropology)*

**[15] SOME DISTINCTIVE TRAITS OF THE LARGO-GALLINA CULTURE IN THE RATTLESNAKE RIDGE AREA**

Mera in 1939 published the first of Largo/Gallina houses which has not changed much with further excavations in the area, but we now have a much clearer picture of the overall culture developed. Architectural features, towers, reservoirs, houses, a possible kiva, and campsites have been investigated through the last 17 years of excavation, presenting a unified cultural picture. Studying pertinent pottery and ethnohistory has provided migration patterns from the Largo/Gallina into the homes of today's descendants. Some unique discoveries in the houses and possible kiva lead to the supposition that the Kachina cult had reached here by the 1200s.

*Ellis, Florence Hawley (Florence Hawley Ellis Museum of Anthropology) [Discussant 15]*

*Ellison, James G. and Steven A. Brandt (Florida) [82]*

*Elston, Robert G. (Intermountain Research)*

**[07] EBB AND FLOW: STABILITY AND PERSISTENCE OF MARSHES IN THE CARSON DESERT**

It has been suggested that conditions favoring creation and maintenance of Great Basin marshes are ephemeral; thus, marshes, and the resources they contain come and go unpredictably. If true, this

has important implications for settlement and subsistence strategies of prehistoric hunter-gatherers operating in the Carson Desert of Nevada. The present paper describes factors influencing water supply in the Carson Desert and discusses the empirical evidence for annual and long term variation in overall water budget and distribution. It is concluded that, on the scale of human experience, marshes form stable and persistent ecosystems in this setting.

*Elston, R. G. (see Leach, M.) [47]*

*Emerson, Alice M. (Washington State)*

**[39] ARCHAEOLOGICAL IMPLICATIONS OF VARIABILITY IN THE ECONOMIC ANATOMY OF BISON BISON**

Analyses of four modern bison carcasses provide data on variability in the relative yields of meat and fat in this animal. These data suggest that age and sex play major roles in determining relative yields, and that the differences are large enough to potentially influence hunter selection decisions. These decisions are made at three levels before and after the kill. The relative yields of different herd types, carcasses, and carcass units are important factors influencing selection. Three carcass unit utility model types, based upon caloric yields of meat and/or fat, provide options for the analysis of archaeological bone assemblages.

*Enloe, J. G. (see Burgett, G. R.) [39]*

*Erickson, Clark L. (Pennsylvania)*

**[74] PREHISTORIC AGRICULTURAL INTENSIFICATION: A PERSPECTIVE FROM THE ANDEAN HIGHLANDS**

Prehistoric raised field agriculture in the Americas is commonly considered to have developed as a response to population pressure, as proposed in Boserup's model of agricultural intensification. Archaeological survey and excavation provide evidence that raised field technology developed early in the Lake Titicaca Basin of Peru (ca. 1000 BC) in the absence of population stress. Experimental archaeological investigation based on the reconstruction and use of abandoned raised fields indicates that this agriculture is very efficient. It is argued in this paper that raised field agriculture was an early option chosen by wetland agriculturalists for the expansion of lacustrine-oriented economies.

*Ericson, Jonathan E. (UC-Irvine) and Jerome Kimberlin (Chevron)*

**[33] CHEMICAL DIFFERENTIATION OF FLOWS AND SOURCE AREAS IN CALIFORNIA BY INSTRUMENTAL NEUTRON ACTIVATION AND STATISTICAL ANALYSES**

Instrumental neutron activation and statistical analyses are used to differentiate obsidian flows and source areas in California. We find that the best discriminating trace elements are different than those routinely used in x-ray fluorescence analysis. The overall accuracy of chemical characterization is greatly improved with the reduction of the potential of Type II error reported by researchers using x-ray fluorescence.

*Ericson, J. E. (see Peterson, M. L.) [68]*

*Ericson, J. E. (see Prior, C.) [68]*

*Ericson, J. E. (see Cisowski, S.) [68]*

*Ericson, J. E. (see Takaesu, M.) [68]*

*Erlanson, Jon (Alaska) [74]*

*Evans, Susan T. (Penn State)*

**[64] HOUSEHOLD RITUAL IN AZTEC LIFE**

Small ceramic figurines offer a view of Aztec religious life on the personal and everyday level that is not revealed in extant texts and monuments. Figurines from the house strata in the Aztec village of Cihuatecpán depict a range of deities, most devoted to fertility and textile arts. This study presents the range of types, relative frequencies, and changes in frequency over time in order to understand changes in the larger ideological realm from the early Aztec period into early Colonial times, and the contrast between village and urban centers with regard to the public expression of religion.

*Evans, Susan T. (Penn State) [Discussant 50]*

*Evett, Daniel*

**[20] SMALL, MEDIUM, LARGE, AND JUMBO: SETTLEMENT SIZE AND SOCIO-ECONOMIC EVOLUTION IN THE NEOLITHIC OF SOUTHEASTERN ITALY**

How is it that the earliest farming cultures of the Tavoliere plains of southern Italy lived in increasingly larger yet apparently socially and economically undifferentiated communities in the

context of reduced regional population densities? It is proposed that these developments as well as the changes in settlement positioning, household and settlement longevity, and resource catchments were the consequence of cultural limitations in managing the instabilities induced by agro-pastoral economies in a fragile Mediterranean ecosystem. The culmination of this ecological and cultural destabilization was the rapid depopulation of the region.

*Ezzo, Joseph (Wisconsin-Madison)*

**[43] THE RECONSTRUCTION OF MAMMALIAN FOODWEBS AT TWO ROCKSHELTERS: IMPLICATIONS FOR PALEODIETARY ANALYSIS**

A multiple trace element analysis is performed on selected fauna from four temporally discrete levels at the Ventana Cave (AZ) and Modoc Rockshelter (IL) sites in an attempt to reconstruct basic mammalian foodwebs at each site. Methodological emphasis is placed on evaluating the effectiveness of three bone-cleaning techniques in recovering dietary signatures. Values of strontium and barium, elements proven effective as dietary indicators, are analyzed, as are values of magnesium, which may prove successful as a dietary discriminant as well. The results are discussed in terms of diagenesis and the prospects of recovering dietary signatures from prehistoric human bone.

*Fairley, Helen C. (National Park Service) and Phil R. Geib (Navajo Nation Archaeology Department)*

**[33] DATING FREMONT ANTHROPOMORPHIC ROCK ART IN GLEN CANYON, SOUTHEAST UTAH**

The Fremont were largely contemporaneous with the Anasazi, but many aspects of material culture differentiate these two general groups. Rock art is one aspect, especially the broad-shouldered, often horned anthropomorphs that are a hallmark of Fremont rock paintings and carvings. Tracing the origin and development of Fremont anthropomorphic styles has a direct bearing on the origins of the Fremont culture. Without a well defined chronology, however, it is impossible to establish the precedents and antecedents of specific design elements and decorative treatments. Recent investigations and radiocarbon dating of several Fremont rock art sites in Glen Canyon, Utah are reported.

*Falconer, S. E. (see Lindly, J.) [22]*

*Farley, J. (see Limp, W. F.) [66]*

*Farrand, William, Carola H. Stearns (Michigan) and Ralph S. Solecki (Columbia)*

**[55] REVISION OF CHRONOLOGY OF YABRUD SHELTER I, SYRIA**

New, detailed sections have been drawn of Rust's original sections, exposed after removal of abundant backfill. These confirm Rust's statements about the discontinuous nature of his 25 cultural horizons, and we found one previously unknown cultural level at -8.5 meters. Balks unreported by Rust were encountered between several of his trenches, and Rust did not excavate as deeply in each trench as he implies in his monograph, thus preserving intact cultural materials. Moreover, the so-called "Flugsand" is clearly a water laid deposit. ESR-dating of teeth and TL-dating of burnt flints are underway.

*Farris, Glenn J. (California Department of Parks and Recreation)*

**[34] OVERVIEW OF NATIVE ALASKAN DISPERSAL IN THE NORTH PACIFIC**

One by-product of the arrival of the Russian-American Company to the North Pacific was the forcible dispersal of a large number of skilled Alaskan hunters from the Aleutian Islands, Kodiak and the Kenai Peninsula to the various outposts of the Company. These people were taken to places as diverse as Baja California, the Channel Islands near Santa Barbara, the Farralones, Fort Ross, Southeast Alaska, and the Kurile Islands north of Japan. Although normally used as hunters, they were often involved in violent battle with peoples they encountered who objected to their apparent poaching. The extent and timing of this dispersal will be presented as a setting for the session papers.

*Fash, Jr., William (Northern Illinois)*

**[18] THE HOLISTIC APPROACH TO CLASSIC MAYA STUDIES: THE COPAN EXAMPLE AND ITS IMPLICATIONS**

Fifteen years of multi-disciplinary research in Copan, Honduras, have provided a wealth of information on Classic Maya society, political organization, ideology, and socio-economic evolution. The coordinated research and complementary results of scholars from different fields allow for greater insights and more rigorous testing of alternatives than possible when a single explanatory framework and its respective approach and methodology are employed. Feedback between researchers, data sets, and their respective interpretations in Copan archaeology are illustrated, and the implications of this research for studies of Classic Maya society and culture change are discussed.

***Feathers, James K. and James K. Feathers (Washington)*****[40] AN EVOLUTIONARY INTERPRETATION FOR THE PREDOMINANCE OF SHELL TEMPERING IN LATE PREHISTORIC SOUTHEASTERN MISSOURI CERAMICS**

Crushed shell became the predominant nonplastic ceramics beginning in the Late Woodland in southeast Missouri as well as other parts of the east. An explanation for this success requires review of historical origin and selective value. Evidence is presented to explain the adaptive significance of shell and why it did not enjoy wider usage prior to the Late Woodland.

***Feinman, Gary M. (Wisconsin-Madison)*****[18] ARCHAEOLOGY WITHOUT A CAPITAL 'D': THE CASE OF OAXACA**

During the mid-to-late 1980s, archaeology has been beset by a series of false or forced dichotomies—simple scientism vs. hyper-reflexivism, arch-empiricism vs. uncritical approaches, and the polar positions in the processual/post-processual debate. These extreme dichotomies have deflected attention from archaeology's important accomplishments, as well as from necessary realizations, such as the rich complexity of human past, the role of scale in archaeological interpretation, and the importance of integrating multiple lines of evidence. Illustrative examples, drawn largely from prehispanic Oaxaca (Mexico), are discussed to help set a less extreme, more holistic theoretical agenda for the archaeology of the 1990s.

***Feinman, Gary M. (Wisconsin-Madison) [Discussant 17]******Ferguson, Jacqueline and Robert E. Warren (Illinois State Museum)*****[69] ARCHAIC STRATEGIES OF SETTLEMENT AND CHERT PROCUREMENT IN THE EASTERN PRAIRIE PENINSULA**

Survey data from an 82-km long highway corridor in the former upland prairies of north-central Illinois indicate that hunters and gatherers of the Early Archaic (10-8 K BP) and Middle Archaic (8-5 K BP) periods had different settlement patterns, due, in part, to environmental change. Lithic artifacts recovered from surface collections and excavations at these sites show significant temporal and spatial variation in terms of artifact categories and the types and source locations of lithic raw material. These patterns have important implications for modeling the dynamics of settlement mobility, site function, and lithic technology in the region.

***Ferguson, T. J. (see Rothschild, N. A.) [56]******Finney, Fred A. (Wisconsin-Madison)*****[69] LATE WOODLAND AND MIDDLE MISSISSIPPIAN CULTURE CONTACT AT THE FRED EDWARDS SITE IN THE UPPER MISSISSIPPI RIVER VALLEY: THE HOUSEHOLD EVIDENCE**

This paper focuses on a recently discovered site in southwest Wisconsin that has evidence of cultural interaction with the Cahokia cultural sphere. The primary research objective is to shed light on the nature of Cahokia's northern hinterland. Late Woodland and Middle Mississippian culture contact at the Fred Edwards site is evident in a wide range of nonlocal lithic and ceramic items. The large diversity of recovered items suggests the site inhabitants had been engaged in a far ranging exchange system. Analysis by the individual household units indicates each one was apparently self sufficient in maintaining themselves and producing items for exchange within the Cahokia cultural sphere.

***Fischer, Franz (Tübingen)*****[16] THE EARLY CELTS OF WEST CENTRAL EUROPE (6TH/5TH C. BC): THE SEMANTICS OF SOCIAL STRUCTURE**

Since 1877 the standard term for the graves and settlements of Late Hallstatt West Central Europe has been "Furstengräber", or princely burials, and "Furstensitze", or princely seats, respectively. Imports like the Vix krater seem to represent a rex, princeps, or nobilis in the sense of the later Latin sources, or possibly analogous to the basileus of Phrygian Gordion. Research being done in German-speaking areas today is based primarily on such Old World analogies and has virtually ignored Anglo-Saxon "model-building" theory. This is due partly to tradition, but can also be justified on methodological grounds.

***Fish, Paul R. and Suzanne K. Fish (Arizona State Museum)*****[59] SMALL SITES AND THE LARGE SURVEYS**

Small sites have a strong potential for revealing both synchronic and diachronic aspects of landuse in comprehensive studies of settlement pattern. Along with a richness of small site data comes a number of difficulties of integration with larger habitation sites. Topics include recognition of productive relationships, identification of widespread and diffuse patterns, differential recovery by deposi-

tional regimes, and chronological affiliation. Examples include agricultural extractive and small residential localities in southern Arizona.

***Fish, Paul R. (Arizona State Museum) [Discussant 82]******Fish, P. R. (see Brennan, C. T.) [33]******Fish, S. K. (see Brennan, C. T.) [33]******Fish, S. K. (see Fish, P. R.) [59]******Fish, S. K. (see Bayman, J. M.) [74]******Fisher, Jr., John W. (Smithsonian)*****[82] CAMPSITE ABANDONMENT AMONG EFE PYGMIES, ZAIRE**

Ethnoarchaeological research among Efe Pygmies of the Ituri Forest, Zaire, examines the process and archaeological consequences of campsite abandonment among tropical forest foragers. Efe abandon their campsites for various reasons, at intervals of about every six weeks. Several distinctions regarding the location of artifacts and ecofacts at abandoned camps are critical to archaeological interpretations; these distinctions include inside and outside of dwelling, on trash heaps, and in the area enclosed by the arrangement of dwellings. The materials left at abandoned camps are informative of Efe settlement pattern, organization of technology, and final activities at the site.

***Fisher, Lynn (Michigan)*****[47] VARIABLE CORE REDUCTION STRATEGIES IN THE SOUTHWEST GERMAN MAGDALENIAN**

Stone tool technology during the Magdalenian period in southwest Germany involved selection among alternate techniques of microblade production in a context of seasonally variable economic strategies. This paper reports on analysis of inter-site variation in core preparation and lithic raw material use. Contemporary differences in core technology are discussed in terms of a model of technological organization that postulates costs and benefits of alternate techniques in a range of different production contexts. The potential of this model for explaining some well-documented chronological changes in blade core technology is discussed.

***Flannery, Kent (Michigan) [Discussant 28]******Fletcher, Thomas and Vincent Schiavitti (SUNY-Buffalo)*****[65] TOWARDS A SOCIAL THEORY OF MATERIAL CULTURE**

We examine the use of linguistic and textual models for explaining material culture variability. As we see it, there are three levels of explanation: material conditions, meaning, and agency. We suggest that: 1) linguistic and textual models are primarily designed to get at meaning; 2) both mental constructs and material conditions play an active role in creating material culture variability; 3) it is through agency that these two realms are mediated and played out; 4) explanation at the level of agency should be the ultimate objective of archaeology; and 5) this objective is best achieved through coordinating analytical models and interpretations of both meaning and material conditions.

***Fogelson, Raymond D. (Chicago)*****[23] ANTHROPOLOGY AT THE WORLD'S COLUMBIAN EXPOSITION, CHICAGO 1893-1894**

Anthropology was unusually well represented at the World Columbian Exposition. Not only was a separate building devoted to anthropology, but national and state exhibits also often involved anthropological exhibits and subject matter. Major conferences in anthropology, folklore, and religion were convened during the Fair. This paper will survey some of this activity.

***Ford, D. (see Windes, T.) [17]******Ford, Richard I. (Michigan) [Discussant 59]******Fosberg, Stephen*****[37] THE CHALLENGE OF MANAGING CULTURAL RESOURCES WITHIN A WILDERNESS SETTING**

Congress will soon designate millions of acres administered by the Bureau of Land Management (BLM) as wilderness. Until recently, archaeologists assumed that wilderness status increased site protection by barring future land development. How cultural resources will be managed within wilderness is currently being debated within the BLM. Restrictions proposed by some wilderness advocates could prohibit actions needed for protection, preservation, and research. Efforts within New Mexico to develop cultural resource management policies compatible with the Wilderness Act and

historic preservation mandates will be cited and a discussion presented of the ramifications of these policies for future scientific investigations.

**Fowler, Jr., William R. (*Vanderbilt*)**  
**[01] THE POLITICAL ECONOMY OF SPANISH-INDIAN RELATIONS IN 16TH CENTURY  
 IZALCO, EL SALVADOR**

Like most native populations of Central America, the Izalco Pipil of western El Salvador were devastated in the sixteenth century by the impact of conquest, epidemic disease, and forced labor and tribute. Royal officials and encomenderos brutally exploited native producers of cacao—a leading source of wealth for the crown and colonists. Merchants and clerics were important agents of change. Despite these pressures, the native Pipil of Izalco maintained traditional modes of production, and they participated actively in the regional political economy. Their strategies for survival were shaped significantly by continuities in economic, social, and political structure from the pre-Columbian past.

**Fowler, Andrew P. (*Zuni Archaeology Program*) and John R. Stein (*Bureau of Indian Affairs*)**

**[17] THE ANASAZI GREAT HOUSE IN TIME AND SPACE**

The Anasazi Monuments Project has documented a sequential development of ritual landscapes within one large Anasazi community in Manuequito Canyon, west-central New Mexico, and conducted a reconnaissance throughout the southern and western Anasazi areas. The results of these investigations demonstrate the uniform developments of Anasazi ritual architecture over a vast area of time and space. This paper focuses on the evolution and geographical distribution of the Anasazi great house architectural form from the late A.D. 1000s through the late 1200s, documenting a tradition which continued to develop for over a 100 years after the last building event in Chaco.

**Fowler, A. P. (see Sant, M. B.) [08]**

**Fowler, Catherine S. (*Nevada-Reno*)**

**[38] ETHNOGRAPHIC SUBSISTENCE SYSTEMS IN MOJAVIAN ENVIRONMENTS IN THE GREAT BASIN**

A significant number of native peoples of the Great Basin lived in and depended upon resources of the Mojave Desert. Characteristic subsistence modes such as those developed around the mesquite and agave complexes or those focussed on nocturnal mammals or varieties of reptiles are as yet poorly described. In this paper data are assembled to better define these foci and their overall role(s) in the subsistence systems of certain Southern Paiute and Shoshone peoples. The importance of gardening with Southwest and non-Southwest cultigens is also examined, including its persistence into historic times.

**Fowler, C. S. (see Fowler, D. D.) [23]**

**Fowler, Don D. and Catherine S. Fowler (*Nevada-Reno*)**

**[23] THE USES OF NATURAL MAN IN NATURAL HISTORY**

Most major natural history museums in Europe and the U.S. were developed during the 19th century, including the Columbian Field Museum, Chicago, created in 1893. Natural History museums presented exhibits of "Natural Man;" Native Americans and other "savage races," as part of the "natural world." Natural history museum personnel developed similar exhibits for world's fairs from 1876 to 1915. Seen by millions of fairgoers, the exhibits reinforced the image of non-European-derived peoples as being part of the "natural, savage" world, rather than the "cultural, civilized" world. The history of the "Natural Man" concept and its impact on the development of anthropology and archaeology are discussed.

**Fowler, Don D. (*Nevada-Reno*) [Discussant 07]**

**Fowler, D. D. (see Hattori, E. M.) [07]**

**Francis, H. (see Begay, R. M.) [08]**

**Francis, Julie (*Office of the State Archaeologist-Wyoming*) and George C. Frison (*Wyoming*)**

**[33] AGE AND CHRONOLOGY OF ROCK ART IN NORTHWESTERN WYOMING AND IMPLICATIONS FOR ITS CHANGING ROLE IN SHAMANISM**

The Dinwoody style rock art of northwestern Wyoming has been recognized as some of the most distinctive in the Northwestern Plains. This spatially restricted, anthropomorphic style was believed to date to the Historic Period. However, radiocarbon dates from the Legend Rock site [48H04] suggest an age of at least 2000 years. Steatite pipes and other artifacts found at the Coal Draw site [48H0469] suggest a shamanistic role for the Dinwoody style. When chronological data from other sites in the region is examined, a pattern of changing manufacturing techniques and use of rock art in shamanistic and other ritual contexts is suggested.

**Fratt, Lee (*Arizona*)**

**[47] THE HOMOL'ovi III GROUND STONE ASSEMBLAGE: IMPLICATIONS FOR RESOURCE EXPLOITATION AND AGGREGATION**

Ground stone artifacts are one of the most under studied group of artifacts recovered from prehistoric sites in the American Southwest. The variability in ground stone assemblages from Pueblo III-IV Anasazi sites is particularly marked but not well understood. Using information from experimental studies of use-wear on surfaces of ground stone artifacts, the variability in form and function of the ground stone assemblage from Homol'ovi III, a PIII pueblo along the little Colorado River in northern Arizona, is examined. Implications for resource exploitation and processes of aggregation at Homol'ovi and other contemporary sites are discussed.

**Friedman, Irving, Fred Tremour and Franklin Smith (*US Geological Survey*)**

**[33] OBSIDIAN HYDRATION RATES AS A FUNCTION OF RELATIVE HUMIDITY**

We have determined that the hydration rate of obsidian under surficial conditions is a function of relative humidity (rH). Relative humidity measurements of soil at various sites, integrated over a one year time-span, show that the soil rH is approximately 100% at depths greater than about 10cm. Obsidian samples that hydrated on the surface are exposed to a higher effective temperature than those that were buried. However the effect on the rate of hydration of the lower rH of the surface samples tends to compensate for the increased rate due to the higher temperature experienced by these samples. This explains why surface samples seldom show thicker hydration than those buried in the soil at the same site.

**Frison, George C. (*Wyoming*)**

**[21] CLOVIS HUNTERS AND THEIR PREY: PALEOINDIAN ADAPTATIONS IN NORTH AMERICA**

The most visible Paleoindian sites in North America are the ones resulting from kills of large animals. Weaponry discovered at these sites was well made and efficient with hafted projectile points capable of penetrating the roughest hides. This paper discusses the implications for Paleoindian procurement strategies based on data from these kill and butchery sites as well as the development and elaboration of hunting weapons through time from the Clovis through the Coshen, the Folsom, and the Agate Basin Complexes.

**Frison, G. C. (see Francis, J.) [33]**

**Fritz, Gayle J. (*Michigan*)**

**[75] AGRICULTURAL PATTERNS IN THE NORTHERN CADDOAN ARCHAEOLOGICAL REGION**

A discernible pattern of agricultural evolution in the Northern Caddoan archaeological area is emerging. Temporal trends can provisionally be outlined by combining evidence from Spiro, Huntsville Mounds, and western Ozark rockshelters. Cultigens were present by 1000 B.C. The pre-maize seed crop complex flourished during the first millennium A.D., but maize intensification after A.D. 1000 diminished the importance of indigenous crops. By A.D. 1250, ceremonial centers were supported by maize agriculture, nut and fruit harvesting, and hunting. This region is notable for the presence of Southwestern domesticates not found farther east, probably reflecting exchange networks across the Plains.

**Fritz, John (*Sackler Gallery*) [Discussant 58]**

**Gallareta, T. (see Taube, K.) [02]**

**Gallin, Lenore (*UCLA*) and Robert Tykot (*Harvard*)**

**[06] A BRONZE AGE VILLAGE IN SARDINIA: A PRELIMINARY REPORT OF THE EXCAVATIONS AT NURAGHE SANTA BARBARA (BAULADU) 1986-1989**

Four seasons of excavations in Bauladu, Sardinia, have uncovered the remains of a Bronze Age village settlement adjacent to the partially collapsed complex of stone towers known as Nuraghe Santa Barbara. Although the towers are thought to have been built between the 19th and 16th centuries B.C., finds from the specialized structures of the village come from a secondary phase dating from the 12th-9th centuries B.C. Of particular importance are an abundance of metallurgical remains, including slags, ceramic crucibles, molds and cores. The lead and copper artifacts found are further evidence of metal working activity at Nuraghe Santa Barbara.

**Galloway, Patricia (*Mississippi Department of Archives and History*)**

**[48] RHETORIC AND TRUTH IN THE ETHNOHISTORY OF EARLY CONTACT**

Archaeologists' use of ethnohistorical evidence from the early contact period has been hampered by a frequent failure to apply adequate rigor to the evaluation of written sources. With few exceptions,

these sources portray Indian peoples and their motivations as various sets of Europeans' preconceptions demanded that they be. In this paper I will discuss the effects of the European debate about the humanity of the natives of the New World on the portrayal of southeastern Indians in the documents of the early contact period and the effects of the misapprehension of those documents on archaeological interpretation.

*Galm, Jerry R. (Eastern Washington)*

[32] A REVIEW OF LATE PERIOD PREHISTORY IN THE COLUMBIA PLATEAU

Recent excavations at riverine and off-river sites in central Washington have provided important new information on cultural developments and the nature of group interaction in the Columbia Plateau during the Late Period of prehistory (ca 2500/2000 to 250 B.P.). Information on house forms and the internal structure and geographic distribution of village sites is discussed in the context of existing subsistence-settlement models. Early and late subdivisions of this time period are identified in artifact assemblages, and differences in the internal patterning of sites between subdivisions are examined from the perspective of changes in adaptive strategies.

*Gamble, Clive (Southampton)*

[21] THE CENTER AT THE EDGE

In recent years the Upper Paleolithic of Western Europe has ceased to be the center of the Late Pleistocene world and has instead become a case study of apparently complex societies at its periphery. But even here the regional evidence for settlement and adaptation is partial when compared with either the Russian or North American Plains. The most striking features are the lack of sedentism and systematic large scale procurement of herd animals. Without the evidence for winter villages and bison jumps, the West European evidence poses interpretative difficulties when compared with these other regions. These problems need to be considered before judgments are made about vicariant social process which designates some chosen parts of the Paleolithic World as complex.

*Garber, James and David Glassman (Southwest Texas State)*

[63] THE HUMAN OSTEOLOGICAL REMAINS FROM AMBERGRIS CAY, BELIZE: SOCIAL STATUS AND DIFFERENTIAL ACCESS TO RESOURCES

Excavations at several Maya sites on Ambergris Cay, Belize have produced a burial sample of 43 individuals. Osteological analyses have produced information on social stratification and how it relates to differential health care, access to nutritional resources, and health status. These analyses have also produced data on the degree of stress placed on the island's inhabitants relative to nutrition and disease and the construction of demographic tables (life tables, male/female ratios, survivorship, age/sex distributions, etc.) that characterize the Ambergris Cay population.

*Garman, James C. (Massachusetts-Amherst)*

[58] THE BUILT ENVIRONMENT OF AGRIBUSINESS: SOUTHERN RHODE ISLAND AT THE TURN OF THE CENTURY

During the late nineteenth century Rhode Island agriculture underwent a dramatic shift from a system of small family farms operating on a mixed subsistence/market base to one in which large estates devoted to commercial agribusiness prevailed. The built environment of the later estates reflects the change in the region's agricultural economy. Case studies from Portsmouth and Newport illustrate builders' self-conscious desires to identify themselves as modern while retaining direct physical links to their past in the form of their homestead farms.

*Garrard, Andrew (Sheffield)*

[55] ENVIRONMENTAL DIVERSITY AND SETTLEMENT IN THE LATE QUATERNARY OF JORDAN

During the last decade there have been several major field projects undertaken in the Jordan rift valley, the neighboring highlands and the eastern and southern deserts aimed at reconstructing paleoenvironments, settlement and subsistence through the Late Quaternary and the early Holocene. This paper evaluates the results from these highly contrasting areas and relates them to the broader regional picture.

*Gasco, Janine (Minnesota)*

[01] STRATEGIES FOR SURVIVAL AMONG THE INDIANS OF COLONIAL SOCONUSCO

The Indians of colonial Soconusco were exposed to many of the same Spanish institutions and policies that affected Indians throughout the Spanish colonies. As in other regions, population loss was extremely high following the introduction of new diseases. Unlike the native populations of many other areas, however, the Indians of colonial Soconusco produced cacao, a valuable world market commodity, resulting in their development of unique adaptive strategies. In this paper I

examine individual and community responses to Spanish domination utilizing both archival as well as archaeological data, in particular Indian testimonies in court cases.

*Geib, Phil R. (Navajo Nation Archaeology Department) and G. Lennis Berlin (Northern Arizona)*  
[05] INVESTIGATION OF BASALTIC ASH RIDGE-AND-MOUND AGRICULTURAL FIELDS  
DISCOVERED BY REMOTE SENSING IN NORTH-CENTRAL ARIZONA

During the 12th and 13th centuries A.D., the Sinagua of north-central Arizona both intensified and diversified their agricultural production strategies. The extent to which this occurred is only now becoming evident. Discovery of certain field systems has depended upon the remote sensing technique of thermal infrared imaging. Most recently disclosed are large ridges and mounds of basaltic ash that were created within areas from 2 km<sup>2</sup> to 35 km<sup>2</sup>. These dry farming plots have no parallel in ethnographic accounts from the southwest. Results from investigations of these field systems are reported, and the use of single- and multi-band thermal infrared images for their identification is discussed.

*Geib, P. R. (see Fairley, H. C.) [33]*

*Gibson, D. Blair (UCLA)*

[29] THE SPATIAL EXPRESSION OF EARLY IRISH POLITICAL SYSTEMS

The transition from complex chiefdoms to the primitive state occurred later in Ireland than elsewhere in Europe (the early 12th century A.D.), and within an era of good documentary sources. In the province of Thomond, the historical sources allow the discrimination of the following levels of socio-cultural integration: the lineage, the section, the simple chiefdom, the composite chiefdom, and the chiefdom confederacy. All of these social units possessed discrete territories, and their boundaries, capitals, and religious centers can be reconstructed with a fair degree of confidence as far back in time as the 8th century A.D.

*Gibson, D. E. (see McClenahan, P. L.) [85]*

*Giesen, M. (see Orr, M. R.) [61]*

*Gilead, Isaac (Ben Gurion)*

[55] CHALCOLITHIC FARMER-HERDERS IN THEIR ENVIRONMENTAL CONTEXT IN THE NORTHERN NEGEV

Based on new studies, climatic conditions during the Chalcolithic Period in the Negev were considerably different from today. Humid conditions were the result of rain and dust storms of southern origin and were common in the fall and the spring. The calibrated dates for the sites are ca. 5,000–3,500 B.C. Archaeological evidence indicates that successful farming and herding communities exploited the northern Negev, while the marginal belt, in the foothills, were used as pastures by herders who were based in permanent small villages.

*Gilman, Patricia A. (Oklahoma)*

[14] SETTLEMENT PATTERNS AND THE SEASONAL USE OF PIT STRUCTURES

Ethnographic data from Siberia indicate that the use of both pit structures and other kinds of houses vary predictably. Specifically, pit structures are used instead of other habitations in instances where the food on which a group depends is present in bulk quantities that must be quickly prepared and stored. Pit structure use therefore depends in part on the composition of the environment in terms of seasonally available food. The seasonality of food leads to seasonality of pit structure use. These conclusions are applied to prehistoric pit structure settlement patterns in southeastern Arizona, an area with large pit structure sites.

*Gilreath, Amy J. and W. R. Hildebrandt (Far Western Anthropological Research Group)*

[38] PREHISTORIC HUMAN OCCUPATION OF THE COSO VOLCANIC FIELD, INYO COUNTY, CALIFORNIA

Data obtained from survey/limited testing at nearly 450 sites and data recovery at an additional 33 sites within the Coso Volcanic Field (China Lake Naval Weapons Center), document hunter-gatherer adaptational variations from c. 12,000–200 BP. The spatial distribution of assemblages and features affords insights into diachronic changes in the use and production of Coso obsidian, and the dynamic relationship between food resources and obsidian procurement in resultant subsistence and settlement patterns. Chronological control of this archaeological record relies heavily on obsidian hydration data with corroborating radiocarbon dates.

*Gladfelter, Bruce G. and James L. Phillips (Illinois-Chicago)*

[55] GEOMORPHOLOGY AND THE LATE PLEISTOCENE PREHISTORY OF SINAI

The Upper Pleistocene period in Sinai is represented by chronologically discontinuous technocomplexes, found in rather circumscribed areas of the peninsula. Archaeological data, generated by

both systematic survey and excavation have yielded information concerning the Mousterian, Upper Paleolithic and Epi-Paleolithic periods. This paper will discuss the characteristics of these technological complexes, their paleoenvironmental settings, and the ecological influences on their settlement and subsistence systems.

*Glass, Margaret (Washington)*

[06] TAXONOMIC DIVERSITY AND ECONOMIC SPECIALIZATION IN NEOLITHIC EUROPE

A shift toward specialized forms of domestic animal management has long been suggested as a major economic trend for Neolithic Europe. This paper presents the results of analyses of 59 faunal assemblages from early and late Neolithic contexts throughout central Europe. An investigation of taxonomic diversity is combined with observations on the relative abundances of major taxa and their age and sex profiles. Results of these faunal analyses confirm a trend toward the manipulation of domestic animals for different economic purposes. This trend is related to a general intensification of agricultural practices by the fourth millennium B.C.

*Glassman, D. (see Garber, J.) [63]*

*Glazier, Stephen D. (Kearney State)*

[62] STRONG AND WEAK INTERACTION SPHERES IN THE CARIBBEAN

In his 1971 article "El tiempo delmito," Claude Levi-Strauss arbitrarily distinguishes between strong and weak interaction spheres. He contends that weak interaction spheres (i.e. trade, intermarriages, religious pilgrimages, and so on) leads to local development and/or "transculturation," while strong interaction (e.g. warfare) leads to more rapid acculturation. This distinction will be examined in light of interaction spheres in the historic and protohistoric Caribbean. Attention will be given to both strong and weak interaction among aboriginal groups, aborigines and Europeans, and peoples of Mesoamerica.

*Gobalet, Kenneth (California State-Bakersfield)*

[07] FISH REMAINS AS HABITAT INDICATORS

The remains of fishes smaller than 70mm standard length were recovered by microscopic examination of fine screened material from a Pomo site near Clear Lake, California (CA-Lak-336). The fishes include Sacramento perch, tule perch, hitch, stickleback and prickly sculpin. These remains indicate the exploitation of slow-moving marshy waters among vegetation much like that which still exists near the site today. Today, Elkhorn Slough in Monterey County, California, is a marine estuary. Most of the fish remains recovered during excavation of an archaeological site there (CA-Mnt-229) are from freshwater species which inhabit slow moving, marshy waters. These results help document the local extirpation of freshwater fishes resulting from the redirection of the Salinas River which once entered Elkhorn Slough.

*Goebel, Ted (Illinois-Urbana) and Roger Powers (Alaska-Fairbanks)*

[54] THE NENANA COMPLEX OF ALASKA AND CLOVIS ORIGINS

Excavations at Walker Road and Dry Creek in central Alaska have produced artifact assemblages dated to 11,300 B.P. These Nenana Complex industries are characterized by blade and flake primary technologies, and tool kits including end and side scrapers, wedges, perforators, large cobble tools, and bifacial points and "knives." Significantly, microblade technologies are absent. Comparative lithic analyses reveal that, with the exception of projectile point styles, these assemblages are very similar to Clovis assemblages from the southwest U.S. The significance of these results is discussed, in terms of both Clovis origins and the peopling of the New World.

*Goldberg, Paul (Harvard)*

[55] PALEOCLIMATES AS REFLECTED IN SEDIMENTS FROM LEVANTINE CAVE SITES?

During the recent past, several prehistoric caves have been (re-) excavated in the Levant. The most notable include Tabun, Kebara, Qafzeh, Amud, Hayonim, Geula, Sefunim, Zuttiyeh, Nahal Heimar in Israel, Yabrud, Douara, and Jerf 'Ayla in Syria, and Ksar 'Akil in Lebanon. In most cases, the sedimentological analyses of the deposits essentially provide descriptive information; the palaeoclimatic signal is weak and only loosely interpretable. This situation may indicate either the simple lack of climatic influence on depositional and post-depositional processes, or the effect of non-climatic factors, such as anthropogenic and biogenic sedimentation and transformation of the deposits.

*Goldstein, Lynne (Wisconsin-Milwaukee) and Keith Kintigh (Arizona State)*

[27] REBURIAL AND REPATRIATION: THE ULTIMATE ETHICAL DILEMMA

There is no issue that has caused more moral and ethical problems for archaeologists and other anthropologists than the issue of reburial of human remains. For some, the sides and issues are very clear, but for most, there is no satisfactory solution. This paper attempts to examine the ethical issues

from the perspective of the discipline rather than from individual perspectives. Even for this emotional issue, logical constructs should be available to us. We try to separate the important ethical issues from actions that are personal, pragmatic, or convenient.

*Gomolak, Andrew R. (New Mexico State Land Office)*

[15] WHAT WE THINK WE KNOW VS. WHAT WE HAVE TO LEARN: LIFT UP THINE EYES UNTO THE HILLS

Our "knowledge" of the Largo-Gallina is largely based on intense scrutiny of a very small portion of the region actually occupied. Gallina, and the preceding Rosa, sites are on record over a 2,300-square-mile area of northwest central New Mexico, yet excavation data are almost exclusively limited to sites within the 100-square-mile Lindrith-Llaves vicinity. This paper describes the geographic extent of known site distribution, reviews some relevant theorizing, and proposes a basic framework for future progress in understanding the greater Gallina.

*Gonlin, Nancy (Penn State)*

[36] HOUSEHOLD DYNAMICS AT COPAN

The social dynamics of two Type I sites which represent the lower end of the social scale at Copan are compared using both architecture and burial data. The analysis focuses on Site 9M-24 located in the urban barrios of Sepulturas and Site 30-7 in the Petapilla area. Determination of the household head at each site is a primary task that is achieved through employing various measures. Similarities and differences existed between the two sites and are highlighted in this paper.

*Goodman, David (Harvard) [Discussant 19]*

*Goring-Morris, A. Nigel (Hebrew University of Jerusalem)*

[55] LATE PLEISTOCENE SETTLEMENT PATTERNS IN THE NEGEV AND SINAI

Surveys and excavations over the past two decades in the central, northern and western Negev and northern Sinai have revealed hundreds of Late Pleistocene sites dating to ca 25,000–10,000 B.P. Relatively rapid changes in the techno-typological and stylistic attributes of the lithic assemblages, combined with C14 dates and stratigraphic evidence have enabled the construction of a fairly robust chronological framework. It has then been possible to investigate changing site densities and sizes, and settlement patterns in the light of the documented paleoenvironmental oscillations.

*Grady, James (Colorado-Denver)*

[61] NON-DESTRUCTIVE ARCHAEOLOGY: THE VIEW FROM ABOVE

Archaeologists, for the most part, have a distorted view of the role that aerial photography can play in archaeological research. All will acknowledge the value of aerial photography in the discovery of archaeological sites, however, few recognize its potential as a direct source of independent archaeological data. In addition to discovery, aerial photography can: place a site in its environmental setting, resolve confusion in complex sites, reveal changes in the site through time, and indicate features not visible at ground level. Examples demonstrating the use of aerial photos in the resolution of different archaeological problems will be present.

*Graham, Elizabeth (York) and David M. Pendergast (Royal Ontario Museum)*

[01] MAYA RESPONSES TO SPANISH COLONIALISM IN BELIZE: CULTURAL STRATEGIES OR COMMUNITY INGENUITY?

Excavations at the Spanish Colonial period communities of Tipu and Lamanai, Belize, in company with Jones' ethnohistorical research, has brought to light information on aspects of 16th and 17th century Maya community structure and function. The material remains leave no question that critical social and economic changes were wrought by Spanish occupation; they also illuminate syncretism between Maya and Spanish religious practice, and the psychological impact of European presence. We attempt here to define the patterns of change and the threads of continuity at the two communities, and what these phenomena reflect as regards native strategies for survival.

*Graham, E. (see Mills, A. J.) [27]*

*Graham, Martha (Zuni Archaeology Program)*

[82] PERIODICALLY ABANDONED RESIDENCE AMONG THE TARAHUMARA: SETTLEMENT ORGANIZATION AND ASSEMBLAGE VARIABILITY

When abandonment is an integral part of a group's settlement organization, anthropologists should be able to anticipate some of the material consequences of the movement. Tarahumara (Raramuri) agriculturalists who use several residences throughout the year periodically abandon and return to the same places over the course of the year or after several years. The nature of Tarahumara settlement organization results in characteristic assemblages at their periodically abandoned residences. An

ethnoarchaeological example of Tarahumara residences provides some insights into the possible archaeological assemblages at residential sites in this type of settlement system.

*Graham, M. (see Merrill, W.) [14]*

*Gratz, Kathleen (Navajo and Hopi Indian Relocation Commission)*

[08] NEW LANDS PUERCO VALLEY ARCHAEOLOGICAL PROJECT: THIS FEDERAL CONTRACT ARCHAEOLOGY PROGRAM ENCOURAGES RESEARCH

The relocation of Hopi and Navajo people, while distressful, has resulted in positive contributions to cultural resource management. A continuing program in support of new Lands development near Sanders, Arizona dispels the popular myth that contract and research archaeology are mutually exclusive. A six phase, multi-year plan will include research oriented data recovery and culminate in long-term management to protect sites from indirect impacts. Applied research topics are also funded to study the western Chaco phenomenon, application of remote sensing, historic land use patterns and kinship of relocatees, and ethnography of the New Lands.

*Graves, Donna K. (Northern Arizona)*

[08] CONSERVATION OR DEVELOPMENT: A BALANCING ACT

The Navajo Nation "New Lands" are slated for the relocation of families displaced by the Navajo-Hopi land dispute. Portions of the New Lands contain valuable archaeological sites, including Navajo Springs, a Great House and surrounding community on the western frontier of the Chacoan interaction sphere. This paper examines how apparently incompatible goals of archaeological conservation, scholarly research, and economic development can be resolved in a mutually beneficial way. Several alternatives are discussed, including stabilization and conservation measures, the development of a tribal park, or the establishment of a research center.

*Graves, Michael W. (Hawai'i-Manoa)*

[84] FOOD PRODUCTION IN AN ARID CONTEXT: FARMING ON LANAI

Much emphasis has been placed on the description and analysis of dryland and irrigated fixed-field agricultural systems in Hawaii. Yet, on several islands large numbers of agricultural features have been located which defy categorization into either of these systems. These features, including mounds, pits and terraces, are found in arid zones and on some islands, they comprise the largest array of structures. Recent work on the Island of Lanai suggests these features were used opportunistically, and are part of a late prehistoric expansion of agriculture into the most marginal zones of the archipelago. This expansion followed earlier intensification efforts in more optimal zones.

*Grayson, Donald K. (Washington)*

[42] GREAT BASIN ALPINE VILLAGE FAUNAS

Vertebrate faunas from a dozen alpine villages in the Toquima Range, Nevada and the White Mountains, California, are extremely similar to one another in terms of both taxa represented and the relative abundances of those taxa. Taxonomic richness scales well with sample size and with altitude, the latter reflecting decreasing numbers of taxa available at increasing elevations. Cut-marks suggest heavy use of marmot meat and skin; the White Mountains marmot "reverse utility curve" reflects density-mediated bone destruction, not body part transport; facile interpretations of "utility curves" are inappropriate. Attributes of bone burning and breaking may be related to fuel scarcity.

*Green, William (Iowa)*

[69] PATTERNS AND PROCESSES OF EARLY MISSISSIPPIAN INTER-SOCIETAL CONTACTS WITHIN THE CAHOKIA INTERACTION NETWORK

The projection of Mississippian "influences" into distant regions north and west of Cahokia is examined. Researchers have posited an economic basis for these interactions, with commodities fanning out from or funneling into the American Bottom. An alternative model proposes that the inter-regional Cahokia interaction network initially was more concerned with acquisition of knowledge about distant peoples and territories. Such information was critically important in the formation of alliances and in an overall consolidation of power by newly-emerged ruling elites. Connections between two distant regions (the Upper Mississippi Valley and the eastern Plains) and the American Bottom are examined within this context.

*Greenwood, Roberta S. (Greenwood and Associates)*

[03] A VIEW FROM THE OUTSIDE

Federal standards, procurement methods, contract administration, and levels of testing and mitigation are reviewed from the perspective of those who attempt to tread the fine line between professional research and the services requested by the agencies. Major problem areas include criteria for site

evaluation and survival of the resource base. These become almost insurmountable when agencies are project-oriented, review or appeal procedures are weak, and available funds are under pressure.

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

[33] PREHISTORIC IRRIGATION IN THE TAOS VALLEY, NEW MEXICO

Archaeologists have long debated the origins of irrigation in the Northern Rio Grande Valley. Despite 16th century reference to aboriginal ditch systems, many archaeologists argue that such technology was introduced by Spanish colonists. Research on Taos Pueblo lands have documented the existence of prehistoric ditches through infra-red aerial photography review and ground inspection. Although dating remains problematic, the prehistoric attribution is based primarily on the sole association of prehistoric features with one ditch, and the superimposition of ditch systems in subsequent use areas. Ditches, in addition to other water-diversion features, suggest a sophisticated and versatile approach to crop irrigation by Taos Pueblo ancestors.

*Greiser, T. W. (see Greiser, S.) [33]*

*Griffen, Bill (Northern Arizona)*

[28] ARID AMERICA AT CONTACT, AN ETHNOGRAPHIC REVIEW

This paper will summarize the linguistic and tribal distribution and cultural variability in the historic groups as close to the time of European contact as possible in the area that runs north from the border of Mesoamerica into the southern portion of the U.S. Southwest. The major topics are subsistence, demography, settlement patterns, and sociopolitical organization. Restrictions on or distortions of the data stem from inadequate sources to skewed information from processes of cultural (e.g. diffusion) or ecological change set in motion in the very early stages of European-Indian contact. Therefore, there will also be included a brief assessment of the validity of our knowledge on the region.

*Grimm, Linda T. (Oberlin)*

[73] ARCHAIC PERIOD OCCUPATION OF THE SOUTHWESTERN COLORADO PLATEAU

A regional perspective on Archaic Period occupation of the southern fringe of the Colorado Plateau, in northern Arizona, is sought through the study of projectile point distributions. Three issues are addressed in the preliminary analysis: the nature of Archaic settlement as this can be determined from locational data; evidence of inter-regional contact as reflected in the distribution of projectile point types as well as in patterns of raw material utilization; evidence for continuity between Archaic and succeeding agricultural populations of the region.

*Guksch, Christian E. (Heidelberg)*

[06] TOWARDS AN ETHNO-ARCHAEOLOGICAL INTERPRETATION OF OLD KINGDOM SOCIO-POLITICAL ORGANIZATION

The question of primary state formation with regard to pre- and early dynastic Egypt will be discussed in the light of an ethno-archaeological comparative paradigm, using analogies from recent research on chiefdoms and primary states. The historical development, or in other words processes of culture change well into the Old Kingdom will be outlined. The theory of cultural evolutionism will form the data-organizing conceptual framework in order to derive generalizing explanatory statements about qualitative changes in the cultural system.

*Gumerman, George (Center for Archaeological Investigations) [Discussant 08]*

*Habicht-Mauche, Judith A. (SAR)*

[22] POTTERY MANUFACTURE AND TRADE AT ARROYO HONDO PUEBLO (LA 12), NEW MEXICO

Arroyo Hondo is a largely Early Classic Pueblo located on the western edge of the mountains Southeast of Santa Fe. Petrographic and XRF analyses of pottery collections from the site indicate that most of the decorated ceramics represent tradewares. Whitewares appear to have been produced at numerous sites in the Espanola and Galisteo Basins. In contrast, glazewares were produced at a limited number of regional centers in the Cochiti, Galisteo and Albuquerque districts. This shift in the source of decorated ceramics reflects the emergence of a regional system of craft specialization and trade during the Rio Grande Classic.

*Hackenberger, S. (see Croes, D. R.) [74]*

*Hagstrum, M. (see LeCount, L.) [71]*

*Hall, Barbara Ann (Connecticut)*

[51] DOMESTIC REFUSE AND RESIDENTIAL MOUND FORMATION IN LA MIXTEQUILLA, VERACRUZ, MEXICO

This paper will examine patterns of refuse disposal and dispersal in La Mixtequilla, and their role in the formation of residential mounds. While excavated refuse deposits are commonly labelled as

"fill" or "midden", such concepts may subsume a wide variety of deposits of varied characteristics, which suggest very different depositional histories. Characteristics include artifact density, diversity, sherd size and condition, and the presence of whole vessels and eroded daub. These measures will be tested, using models from ethnoarchaeological and other studies, for their validity in determining, for example, rapidity of deposition, degree of disturbance, and mixing of deposits. Domestic mounds in La Mixtequila were commonly occupied over very long periods of time, and were large enough to accommodate several structures. A major force in the formation of domestic mounds was the periodic destruction of wattle and daub houses, the primary residential construction type. Mounds grew through a combination of deliberate buildup and expansion using refuse and fill, and accretion due to the decomposition of daub houses and the erosion of artifacts.

*Hall, M. C. (see Basgall, M. E.) [38]*

*Hamblin, Nancy L. (Nebraska)*

[53] PALEOINDIAN ANIMAL USE AT THE ALLEN SITE (25FT50) IN WESTERN NEBRASKA

Excavation of the Allen Site by Holder and others is providing recent analysts with a wealth of information concerning Paleoindian behavior. The quantity and condition of the faunal material reveal this to have been a multifunctional campsite rather than a kill or butchering site. Besides bison, these early people exploited fauna ranging from mussels, turtles, fish, birds, and rabbits, to pronghorned antelope and deer. Skeletal measurements may permit deductions concerning the sex of the bison at the site; the bison teeth allow conclusions about seasonality. The number and variety of bone implements are unusual for a Paleoindian site.

*Hamilton, Christopher Everett (Whydah Joint Venture)*

[22] DATA RECOVERY AT WLF-HA-L, SHIPWRECK SITE OF THE WHYDAH GALLEY PIRATE VESSEL LOST OFF WELLFLEET, CAPE COD IN 1717

The Whydah Galley was a merchant slave transport on its return to England by the pirate Samuel Bellamy in the Caribbean. The vessel was lost off Cape Cod, MA in April, 1717 during a storm. Recent salvage efforts have been conducted under permits from the US Army Corps of Engineers and a Memorandum of Agreement between the Advisory Council and the Massachusetts SHPO. Archaeological Data Recovery has followed NHPA, section 106 procedures. The Research Report summarizes the results to date of the Data Recovery efforts.

*Hamilton, R. (see Bey, G.) [12]*

*Hammer, E. P. (see York, R.) [52]*

*Hammett, Julia (North Carolina-Chapel Hill)*

[35] CHUMASH PALEOETHNOBOTANY: SEDENTISM WITHOUT AGRICULTURE

At the time of European contact the Chumash economy supported one of the highest population densities in Native North America with a mixed strategy of harvesting wild plant and animal foods. Recent work in ethnohistory and archaeobotany has revealed land use and patch management strategies including prescribed burning, clearing and scheduling. The diversity of plant resources exploited throughout the region and the wide range of variation between microenvironments compels us to reevaluate earlier models of Native Californian subsistence.

*Hansell, P. (see Cooke, R. G.) [09]*

*Hanson, C. (see Bey, G.) [12]*

*Hanson, J. (see Samples, T.) [73]*

*Hantman, Jeffrey (Virginia), Sandra Olsen (Virginia Museum of Natural History) and Gary Dunham (Virginia)*

[69] RITUAL PROCESSES IN THE VIRGINIA ACCRETIONAL MOUNDS

This paper examines the accretional mound complex of central and northwestern Virginia first studied by Thomas Jefferson in the 1780s. This complex consists of spatially bounded group of mounds which crosscut physiographic provinces. The mounds are the subject of considerable current debate concerning the extent to which they represent a unitary cultural expression. This issue is addressed here principally through the analysis of skeletal collections from several of the mounds. Variation between the mounds in patterns of bone modification reflective of secondary burial ritual processes (e.g., cut marks, intentional breakage) is examined and evaluated for its cultural significance.

*Hardaker, Chris (Arizona)*

[58] SYMBOLIC WASHINGTON D.C.

Unexpected results while examining geometric facets of the city plan of Washington D.C. yield speculation concerning the worldview envisioned in the Great Seal of the United States. Large symbols

appear in significant sectors of the city, symbols approximating those of the Great Seal along with several from Freemasonry. Recent revisions concerning the history of the original planning of the city provides an opportunity for a speculative interpretation based on the presence of these symbols. The strong presence of Freemasons and Deists among the Founding Fathers could provide some light on the metaphysical traditions in vogue at the time of this nation's birth.

*Hardy, Ellen T. (UCLA-Institute of Archaeology)*

[51] MORTUARY PRACTICES AND SOCIAL STRUCTURE AMONG PRECOLUMBIAN INHABITANTS OF THE BAY OF CULEBRA, COSTA RICA

Excavations of a cemetery at Nacascolo suggest continuous use from the end of the Zoned Bichrome through Middle Polychrome periods (approximately B.C. 300–A.D. 800). Excellent bone preservation permitted recovery of individual primary and secondary burials and group interments. Mortuary behavior includes animal ceremonialism and various ritual activities. Both sexes and all age groups are represented. Artifact assemblages suggest land clearing and grinding activities common to agricultural subsistence; however, additional funerary evidence reflects maritime influence. Comparisons are made to higher status burials found in other areas of Nacascolo, and dissimilar segregated cemeteries located around the Bay of Culebra.

*Harmon, C. (see Louthan, B. D.) [33]*

*Harper, A. B. (see Laughlin, W. S.) [34]*

*Harriman, Constance (Assistant Secretary-Department of the Interior)*

[26] ARCHAEOLOGIST AND FEDERAL MANAGERS—OPPORTUNITIES FOR ALLIANCE

The Federal government controls about one third of the land in this country. Federal managers responsible for these lands are alarmed about the looting that is destroying America's archeological heritage. The government is bringing many resources to bear on this problem. Law enforcement, training, interagency cooperation, and cooperation among Federal archaeologists, law enforcement officials, and the U.S. Attorneys are all important components of this effort. However, the Federal government cannot do this job alone. Some non-Federal archaeologists have been helpful in attacking this problem, but more cooperation is possible and desirable, especially in the areas of public education, public involvement in archaeological projects, and research aimed at better understanding the looting problem.

*Harris, Marvin (Florida) [Discussant 48]*

*Hartzell, Leslie L. (UC-Davis)*

[86] LATE PERIOD INTENSIFICATION AND THE ROLE OF LACUSTRINE RESOURCES IN THE SOUTHERN SAN JOAQUIN VALLEY, CALIFORNIA

A regional analysis of archaeological data from the southern San Joaquin Valley of California suggests that an intensified use of lacustrine resources occurred during the last 1,000 years. This late period intensification is hypothesized to be the result of increasing local and regional population densities which necessitated changes in technology and scheduling of resource use within lacustrine and surrounding terrestrial habitats. The hypotheses are tested by an analysis of faunal remains from stratified lakeshore deposits at Buena Vista Lake.

*Haselgrave, Colin (Durham)*

[16] LATE IRON AGE SOCIETY IN BRITAIN AND NORTH-WEST EUROPE: STRUCTURAL TRANSFORMATION OR SUPERFICIAL CHANGE?

Although the late pre-Roman Iron Age in NW Europe was a period of obvious archaeological changes, current fashions for interpreting these as a widespread move to political statehood may be questioned. Many of the processes could equally reflect the particular combinations of expansive trade and warfare and internal socio-economic pressures to which Celtic chiefdoms were then exposed, and need not have generated permanent structural changes. We need a different approach: individual processes must be isolated and their particular causation specified, and greater emphasis placed on devising archaeological correlates appropriate to the context which will enable us to monitor significant diachronic developments in the capacity of Celtic societies for centralized decision-making and control, the degree of stratification and the effective scale of integration.

*Hassan, Fekri (Washington State) [Discussant 55]*

*Hastorf, Christine A. (Minnesota)*

[71] CHANGING MENUS—CULTURAL IMPLICATIONS OF ARCHAEOBOTANICAL REMAINS

While botanical analysis has become more common in archaeological research, most often they discuss environmental reconstruction, production, and resource extraction. It is difficult to talk

directly about diet from food remains. This talk will attempt to do so by viewing traditional Andean food concepts, values, and possible meanings of changing food patterns. Botanical data collected from a series of pre-Hispanic houses spanning several phases will be discussed in light of these Central Andean concepts to provide insight about food habit changes and their links to cultural and political changes.

*Hattori, Eugene M. (California Academy of Sciences), William J. Cannon (BLM-Lakeview District), D. Craig Young and Don D. Fowler (Nevada-Reno)*

[07] LAKE FLUCTUATIONS AND SUBSISTENCE ADAPTATIONS IN WARNER VALLEY, OREGON

Warner Valley, Lake County, Oregon contains an impressive array of prehistoric sites including extensive, lakeside habitation sites and walled, upland habitation sites. Regional projectile point styles range from Clovis-like and Great Basin Stemmed to small corner-notched and Desert Side-notched types. Of particular interest, however, have been pronounced, natural lake level fluctuations with concomitant changes in resource availability. This paper explores the impacts of these short-term changes on the archaeological record and potential impacts to prehistoric settlement patterns and resource procurement.

*Haviser, Jay (Institute of Archaeology of the Netherlands Antilles)*

[62] GEOGRAPHIC, ECONOMIC AND DEMOGRAPHIC ASPECTS OF AMERINDIAN INTERACTION BETWEEN ANGUILLA AND ST. MARTIN-ST. MAARTEN

Archaeological investigations of Anguilla and St. Martin-St. Maarten, in the northern Lesser Antilles, indicate a complex pattern of interaction among Amerindian inhabitants. Geographic and economic aspects of the resources available on these islands are discussed to identify prehistoric resource-exploitation emphases, and to identify the variety and distribution of prehistoric sites. All periods of Amerindian inhabitation are mentioned, however due to the nature of the remains, the study will concentrate on the post-Saladoid. This study demonstrates that during the post-Saladoid period Anguilla and St. Martin-St. Maarten should be seen as a single interaction sphere unit.

*Hawkins, Rebecca A. (Cincinnati)*

[74] DO THEY REALLY HOLD WATER? MODELS FOR THE APPEARANCE OF POTTERY IN THE EASTERN WOODLANDS

Models abound for explaining the introduction, whether through invention or adoption, of pottery. Because earthenware vessel use appears to represent a significant addition to previous subsistence practices, it is important to consider the impetus that encouraged such an adaptation. This paper examines several models for the appearance of pottery in the prehistoric economies of the Eastern Woodlands of North America. These models posit a range of causal factors, including changes in subsistence resources, storage, food preparation, and water use. The archaeological data traditionally used to support these models are evaluated, as are those for changes in the organization of procurement and production, settlement patterning, etc., which have been postulated as consequences of applying the new technology.

*Hayden, Brian D. (Simon Fraser)*

[32] PREHISTORIC CULTURAL COMPLEXITY AND CORPORATE GROUPS ALONG THE MIDFRASER RIVER, BRITISH COLUMBIA

The Lillooet locality along the Fraser River in Interior British Columbia witnessed a remarkable development of cultural complexity from 2,000–1,000 B.P. Ideal salmon procurement and preservation conditions as well as geographic constraints on trade routes contributed to the unusual size of villages, residential corporate groups, and socioeconomic differentiation. High status items were similar in the Interior Plateau of British Columbia and Washington and may represent selective but widespread interaction between high-ranking individuals from different communities. This exchange pattern fits the concept of an interactions sphere and can be termed the Interior Plateau Interaction Sphere.

*Hayden, Brian D. (Simon Fraser) [Discussant 60]*

*Hayden, Brian D. (Simon Fraser) [Discussant 70]*

*Hayek, L. (see Dohm, K.) [05]*

*Hays, Kelley A. (Arizona)*

[44] SYMBOL-MINDED APPROACHES TO PREHISTORY: AN OUTLINE OF GOALS AND METHODS

Studies of prehistoric iconography and cross-media comparisons of design content are often criticized for "subjective" messages and "speculative" conclusions. It is argued that such studies may be very productive when: 1. Goals are clearly defined. 2. Initial assumptions about visual communica-

tions and information exchange are clarified. 3. A variety of methods tailored to specific goals and data are employed. An example from seventh century northeastern Arizona is presented.

*Hegmon, Michelle (Smithsonian)*

[58] SYMBOLIC SHELTERS: DOMESTIC AND RITUAL ARCHITECTURE IN THE AMERICAN SOUTHWEST

Architecture creates both paces and barriers and thus can unite as well as divide social groups. The relationship between architecture, social integration, and ritual is examined in Pueblo societies of the North American Southwest. Ethnographic kivas provide shelter and symbolic context for ritual and provide focus for social groups. In contrast, domestic architecture often divides social groups. Prehistoric pit structures were both ritual and domestic places, and interpretations of these structures as kivas is the subject of recent debate. This problem is addressed by considering the role of pit structures in social integration, using data from the northern Southwest.

*Heller, L. Lynette (Arizona State)*

[02] CLASSIC AND POSTCLASSIC OBSIDIAN TOOL PRODUCTION AND CONSUMPTION PATTERNS: A REGIONAL PERSPECTIVE FROM LA MIXTEQUILLA, VERACRUZ

Extensive obsidian data from the Proyecto Arqueológico La Mixtequilla regional survey of south-central Veracruz, Mexico, provide an appropriate basis for addressing both the social setting of obsidian tool production as well as the degree of economic specialization involved for a peripheral consumer population (i.e., far from obsidian geological sources). The issues of horizontally integrated economies, which foster primarily household level production and distribution system, versus vertically integrated economies, are examined in light of these data.

*Helsley-Marchbanks, Anne (Texas-Austin)*

[25] THE INCA PRESENCE IN CHAYANTA, BOLIVIA: THE METALLURGICAL COMPONENT

Chayanta, recognized previously as a regional center for tin and gold production from the Inca to modern periods, also had an early copper/bronze component. Excavations at Muyuntasita, a small Inca period site two kilometers eastnortheast of Chayanta, provided regional Inca-related ceramics, a T-shaped "knife", and ceramic molds, copper pellets, and molded copper fragments indicative of tupu production. These artifacts and their implications in a study of the late prehispanic period in northern Potosí are discussed.

*Hemphill, M. L. (see Wigand, P. E.) [38]*

*Henderson, James (Canadian Parks Service)*

[66] CRM DATABASES IN THE CANADIAN PARKS SERVICE

The Canadian Park Service uses a variety of databases to manage the cultural resources on Parks lands. This paper will examine the several approaches we have taken and the circumstances that led to our diversity of approach. I will present examples from natural and historic parks and discuss a strategy to unify the process. My emphasis will be on "in situ" archaeological resources.

*Henderson, J. (see Regester, J.) [33]*

*Henrikson, Elizabeth (Smithsonian)*

[22] RESIDUE ANALYSIS AND USAGE INTERPRETATION OF A MORPHOLOGICALLY DISTINCTIVE CERAMIC VESSEL TYPE FROM CHALCOLITHIC CENTRAL WESTERN IRAN

A program of inorganic and organic residue characterization at the Smithsonian's Conservation Analytical Laboratory expands the functional study of the "perforated pots" common in the Late Chalcolithic (Period VII) village at Seh Gabi. Carbon-hydrogen-nitrogen (CHN) and energy-dispersive x-ray (EDX) analyses are employed to determine whether ancient content residues are preserved in the vessels' hole-plugs, scrapings from unplugged hole-walls, and control samples of adjacent vessel-wall fabric. Amino-acid analysis attempts to identify the nature of ancient vessel contents. These findings are integrated into a comprehensive interpretation of the functional role of perforated pots in Seh Gabi's domestic economy.

*Herbich, Ingrid and Michael Dietler (UC-Berkeley)*

[57] SETTLEMENT BIOGRAPHY: A DIACHRONIC PERSPECTIVE ON SETTLEMENT ORGANIZATION AND THE SYMBOLIC DIMENSIONS OF THE LUO HOMESTEAD

The spatial organization of Luo settlements is determined by strict ritual regulations and a shared idea model which symbolically underline the segmentary-lineage-based social structure. The actual layouts of homesteads, however, evince considerable variation. This apparent inconsistency is explained by the fact that settlements are a dynamic form of material culture in continual transformation. Examination of an individual homestead over the course of its typical three-generation life-cycle

reveals how its organization reflects the stage and composition of the polygynous extended-family residing in it. A wider focus shows that the social landscape simultaneously contains settlements at all life-cycle stages and that both micro- and macro-scale analysis are necessary to comprehend underlying patterns. Implications for settlement archaeology are discussed.

*Herzog, Zeev (Tel Aviv)*

[55] SETTLEMENT AND CLIMATE CHANGE DURING THE EARLY BRONZE AND IRON AGES IN THE BEER-SHEBA VALLEY, ISRAEL

Semi-arid climatic conditions of the Beer-sheba Valley prevented the erection of permanent settlements throughout most of its history. Apart from military forts or trade stations, large sites of civilian population are found only during two phases: Early Bronze Age II (ca. 2900–2600 B.C.E.) and Iron Age I (ca. 1200–1000 B.C.E.). It is argued that the main explanation of this phenomenon is the possibility, during these short periods, of carrying out dry-farming, due to milder climatic conditions. This claim is supported by the long gaps in sedentary occupation in the Valley, by the civilian-agriculturalist character of the settlements (house plans and storage facilities), and by the paleobotanical and zooarchaeological data.

*Hester, James J. (Colorado-Boulder)*

[61] PROBLEMS IN THE ADOPTION OF HIGH TECHNOLOGY IN ARCHAEOLOGY

The adoption of high technology as part of the techniques utilized in archaeological research is not a simple matter. The term for such an adoption is "technology transfer." In essence, "technology transfer" means the use of a technology developed in one discipline to solve the problems of concern to another discipline. However, there is as yet no methodology developed that can guarantee that such an adoption will be successful. We shall explore aspects of the traditional mindset and institutional infrastructure of archaeologists which serve as impediments to the adoption of new technology in archaeological research.

*Hester, Thomas R. (Texas-Austin)*

[28] THE ARCHAIC COAST TO COAST: EXAMINING ARCHAIC PATTERNS FROM SOUTHERN CALIFORNIA TO THE GULF OF MEXICO

This paper provides a review of the Archaic lifeways encompassing the vast region from southern California (and adjacent Great Basin), across the desert Southwest, the semi-desert areas of western and southern Texas, and the southern Texas coast. Regional subsistence technologies (and specializations) are defined and specific adaptive responses, such as trade, are discussed. The Desert Archaic of the Southwest preceded agriculture and sedentary developments of significant scale. By contrast, the southern California/Great Basin Archaic and the Semi-Desert Texas Archaic remained as hunting and gathering traditions until well after initial European contact.

*Hester, Thomas R. (Texas-Austin)* [Discussant 27]

*Hester, Thomas R. (Texas-Austin)* [Discussant 70]

*Heyden, Doris (Instituto Nacional de Antropología e Historia, Mexico)*

[64] WOOD IN LIFE AND DEATH

Among the Aztecs of Late Postclassic Mexico—and undoubtedly in earlier times—wood was a sacred material, the body of some of the gods, a special firewood with which deceased rulers were cremated, the tree that held earth and sky together, the tree that once had been man and had kept his "rational soul", the tree that was a metaphor for those who wielded power. Wood as sacred material will be examined in archaeological artifacts, in historical sources of the sixteenth century, and in pictorial codices.

*Hide, C. (see Crew, P.)* [47]

*Hietala, Harold and Frank Winchell (Southern Methodist)*

[61] ARCHAEOLOGICAL DIVERSITY: A CLOSED FORM SOLUTION FOR CALCULATING THE RAREFACTION CURVE

Measuring archaeological diversity by comparison with simulated assemblages seems to be prevalent in the archaeological literature today. One such method is intuitively and mathematically based on the ecological concept of 'rarefaction' where the expected number of 'types' is plotted as a function of the assemblage size. Here a closed form solution for the expected number of types and its standard deviation is presented rendering the simulation approach unnecessary. Archaeological applications are given.

*Hildebrandt, W. R. (see Gilreath, A. J.)* [38]

*Hill, II, Robert (Texas-San Antonio)*

[01] THE SOCIAL USES OF WRITING AMONG THE COLONIAL CAKCHIQUEL MAYA: NATIVISM, RESISTANCE, AND INNOVATION

Alphabetic writing was introduced to the peoples of Mesoamerica as a byproduct of the Spaniards' conquest and subsequent colonial administration of the region. Among the recipients of the new medium were the Cakchiquel Maya of highland Guatemala. This paper examines the varied uses to which the Cakchiquel of the Colonial period put writing. These included maintaining traditional aspects of their culture, resisting Spanish policies, and confronting new problems created by the colonial situation.

*Hinsley, Curtis M. (Northern Arizona)*

[23] MESOAMERICAN ARCHAEOLOGY AND THE CHICAGO WORLD'S FAIR

The World's Columbian Exposition of 1893 in Chicago not only celebrated four centuries of industrial civilization in the western hemisphere, in an adjunct manner, and as a necessary basis of comparison, the occasion also aroused interest in aboriginal peoples throughout the Americas, thereby presenting an opportunity to display the current status of anthropological and archaeological knowledge. While the result mixes serious intentions with undeniable exploitation, in the case of Mesoamerican archaeology, the exposure aroused public interest and private financial support, leading to new impetus and direction in Mayan work. This paper reviews North American efforts in Mesoamerica prior to the Chicago Fair, examines the presentation of Mayan architecture and epigraphy at the Fair, and traces certain developments that grew directly from the Chicago experience, specifically work at Chichen Itza in Yucatan between the 1890s and the Mexican revolution.

*Hirst, K. Kris and Marcel Mendoza (Iowa)*

[50] SURFACE CERAMICS AT OTUMBA: IMPLICATIONS FOR SITE SIZE, CHRONOLOGY, AND ORGANIZATION

Analyses of approximately 350 of the 798 random surface collections (1% sample) made at TA-80 [Otumba] in the 1988 Field Season have been completed. Comparisons of total collection size and composition, as well as comparisons of selected ceramic wares, forms, and design categories have been carried out for the analyzed samples. These comparisons, along with plots on the site map, permit us to delineate site boundaries, the Early and Late Aztec and Early Colonial occupations, the areas and sequence of craft intensification, and intra-site variation in social, economic, and political status.

*Hockett, Bryan Scott (Nevada-Reno)*

[43] ARACHNID TAPHONOMY: NOTE ON SCORPION REMAINS IN ARCHAEOLOGICAL CONTEXT

Scorpion remains may be deposited in caves and rockshelters by cultural and noncultural processes. Prehistoric inhabitants of Falcon Hill, Nevada, utilized scorpion stingers (telsons) as necklace beads. Raptors (particularly owls) consume and regurgitate scorpion remains. A comparison of telson necklace beads from Falcon Hill to telsons from raptor roost located in the Smoke Creek Desert, Nevada, revealed that telsons modified by raptors do not mimic the Falcon Hill telson necklace beads. Thus, individual telson beads should be identifiable from caves and rockshelters. Scorpion remains are also taphonomic indicators of noncultural process, alerting archaeologist that owls have likely affected a site.

*Hodder, Ian (Cambridge)*

[31] THE ROLE OF INTERPRETIVE PREHISTORY

Most post-processual archaeology has refrained from fully interpretive accounts; they continue to rely heavily on externally imposed theories and guidelines, broader schemes. The archaeological data remain secondary to a wider strategic, theoretical or political purpose. As a result post-processual archaeologies have rarely broken out of the privileged institutional framework within which they work and their theoretical posturing has revitalized older structures of domination. An interpretive prehistory, as opposed to an anthropological archaeology, is defined, and its potential for transforming the relations of production of academic knowledge is discussed. The importance of debate through rather than over the data is emphasized.

*Hodge, Mary G. (Houston-Clear Lake)*

[64] BIG-CITY STYLE AND RURAL LIFE: STANDARDIZATION AND REGIONAL VARIATION IN AZTEC DECORATED SERVING DISHES

Archaeological studies of Aztec ceramics have focused on temporal variation but have not addressed the regional variation in Aztec III, or Tenochtitlan phase, serving vessels, a ceramic type associated with political consolidation of the Valley of Mexico and imperial expansion outside it. Collections

from regional surveys and excavations in the Valley of Mexico are used to assess the extent to which hinterland communities imported ceramics from major urban centers or obtained serving vessels from local workshops.

**Hoffecker, John (Argonne National Laboratory)**

**[67] MOUSTERIAN ADAPTATIONS ON THE SOUTH RUSSIAN PLAIN**

Collections of artifacts and faunal remains from several Mousterian open-air sites in southern Russia were examined. The sites include Sukhaya Mechetka, Il'skaya I, Nosovo I, and Rozhok I; they appear to have been occupied primarily during oxygen-isotope substages 5d-5a. Although the faunal assemblages contain a diverse array of mammals, steppe bison is predominant. Analysis of the Il'skaya I assemblage revealed new information about bison procurement (e.g., seasonality, hunting tactics). All of the sites appear to have been multiple-activity loci, used for secondary processing of mammalian prey, and production/curation of stone tools. Mapping of occupation floors by Soviet excavators provides some glimpses of internal site structure.

**Hoffman, Michael P. (Arkansas-Fayetteville)** [Discussant 75]

**Hofman, J. L. (see Amick, D. S.)** [54]

**Hogan, Patrick (New Mexico) and Bradley J. Vierra**

**[05] ARCHAIC MOBILITY STRATEGIES IN NORTHWESTERN NEW MEXICO:**

**IMPLICATIONS FOR THE ADOPTION OF AGRICULTURE**

Although several useful models have been developed to describe Archaic settlement systems in northwestern New Mexico, research has been hampered by a lack of data from upland settings and by the synchronic focus inherent in ecological studies. In this paper, ethnographic data on the size of hunter-gatherer annual ranges are compared with the distribution of nonlocal lithic materials at Archaic sites in the San Juan Basin to provide a chronologically-sensitive index of regional population movements. When this information and chronometric indices of occupational intensity are examined, changes in mobility strategies are evident in response to fluctuating environmental conditions, demographic pressure, and to the introduction of cultigens.

**Hohman-Caine, C. (see Peters, G.)** [52]

**Holdaway, S. J. (see Dibble, H. L.)** [81]

**Holen, Steven R. (Kansas) and Robert K. Blasing (Bureau of Reclamation)**

**[53] TWO LATE PLEISTOCENE SITES IN THE CENTRAL PLAINS: PRELIMINARY STATEMENTS**

Recent investigations at two late Pleistocene sites in the Republican River drainage provide evidence for human association with extinct fauna. At the Eckles Site, on White Rock Creek in northcentral Kansas, Clovis lithic artifacts have been found on a beach surface with mammoth, horse and bison faunal material. The large majority of lithic material found at this site has moved a minimum distance of 450 km. The second site, on Medicine Creek in southwestern Nebraska, has yielded mammoth bone exhibiting green bone fractures, possible mammoth bone tools, and two small flakes. The site, situated in late Pleistocene loess, may be 12,000 years B.P. or older according to radiocarbon dates on mammoth bone.

**Holley, Lisa DeLeonardis (Catholic)**

**[22] PARACAS SETTLEMENT IN THE LOWER ICA VALLEY, PERU, 5TH–1ST CENTURIES, B.C.**

Recent field research in the lower Ica Valley on Peru's arid south coast provides new data with which to view the settlement configuration of the Paracas culture, ca. 500 B.C. These data reveal an occupation history spanning 500 years in oases areas along both sides of the Ica River. In the Callango region of the lower valley, habitation is dense and continuous through the 1st century A.D. Ceramic data collected from non-burial proveniences exhibit a diverse range of both plain and decorative specimens. Occupational debris suggests continued interaction across time with the coast and the highlands. These data contribute to a clearer understanding of Paracas culture and settlement in a desert environment during the Early Horizon.

**Holstein, Harry and Phillip Koerper (Jacksonville State)**

**[11] THE BATTLE OF TALLASSEEHATCHEE, AN ARCHAEOLOGICAL INVESTIGATION INTO AN EARLY CREEK WAR MASSACRE**

Jacksonville State Archaeological Resource Laboratory recently began excavating 1Ca162, the Battle of Tallasseehatchee Site, near Alexandria, Alabama. This site was believed to be the location of a major military encounter of the War of 1812 in which 1,000 Tennessee militiamen under the command

of General Andrew Jackson attacked a Red Stick Creek Indian village. In the course of the battle, 187 Creek Indians and five Tennessee militiamen were killed. Archaeological, historical, and topographic data gained through this investigation confirms 1Ca162 as the location of the historic battle.

**Holzhall, Vince and Glenn Davis Stone (Columbia)**

**[20] DISPERSED SETTLEMENTS, INVISIBLE VILLAGES**

Kofyar farmers have abandoned their homeland to colonize part of the Benue Valley in Nigeria, forming a settlement pattern of dispersed farmsteads. Although settlement is continuous, lacking visible segmentation, the Kofyar recognize distinct "villages" of roughly the same size as their homeland villages. Examination of how village size and boundaries are determined provides insight into what villages "do". This paper discusses Kofyar villages as units of labor mobilization and political authority.

**Homburg, J. A. (see Altschul, J. H.)** [05]

**Hood, J. Edward (Massachusetts-Amherst)**

**[58] INTEGRATING SOCIAL RELATIONS AND THE BUILT ENVIRONMENT: CULTURAL LANDSCAPE STUDIES**

Social structure and the humanly-created physical space where social action takes place are interactively linked. Social action is the main dynamic behind the creation and transformation of society, with the cultural landscape both the arena and the tool for social and economic relations. Various theoretical approaches to material culture are used to help demonstrate how and why the built environment, or more generally, the cultural landscape, is actively used. The creation and town plan of Deerfield, Massachusetts serve as an example.

**Hoopes, John W. (Kansas)**

**[09] THE CONTEXTS OF THE EARLIEST CERAMICS IN COSTA RICA AND NICARAGUA**

In Costa Rica, the earliest pottery (dated to c. 2000 BC, calibrated) appears not in coastal sites, but at villages located well inland. Ceramic complexes from other inland regions are considered to be closely related despite some chronological inconsistencies. Comparative analysis of cultural ecological adaptations associated with early ceramic assemblages in Costa Rica and Nicaragua and areas to the north and south suggests a complex and highly regionalized pattern for the emergence of early sedentary society in Central America as a whole.

**Horne, Lee (Pennsylvania)**

**[82] LOCATIONAL AND OCCUPATIONAL INSTABILITY IN ARID LAND SETTLEMENT**

Mounds with long sequences of occupation are characteristic of the archaeological landscape in many areas of the Near East. Even so, occupation over the long term is not typically continuous. Ethnoarchaeological data from northeastern Iran are used to describe and explain two kinds of settlement instability: spatial or locational and temporal or occupational. Technological (e.g. qanat irrigation, pastoralism), economic (e.g. land values, degree of investment) and political (e.g. degree of security, presence/absence of central places) factors contribute to both kinds of settlement instability and thus to the shape of archaeological sites.

**Howell, Todd L. (Arizona State)**

**[61] ASSESSING THE EFFECTIVENESS OF AUGER TESTING AS A PREDICTOR OF SUBSURFACE ARTIFACT DENSITY**

Subsurface testing, using either shovel or auger, is usually employed as a means of finding archaeological sites which exhibit little or no surface manifestations. This presentation addresses the use of auger testing as a predictor of subsurface artifact density for known sites, specifically in the La Mixtequilla region of Veracruz, Mexico. Potential problems are discussed, as well as an assessment of the viability and accuracy of this sort of testing program.

**Huckell, Bruce B. and Lisa W. Huckell (Arizona State Museum)**

**[05] THE ADOPTION OF AGRICULTURE IN THE ARID SOUTHWEST: NEW INVESTIGATIONS AT THE FAIRBANK SITE, SAN PEDRO RIVER VALLEY**

As part of a study of the adoption of agriculture in southeastern Arizona, limited archaeological and geological research was conducted at the Fairbank Site, type site for the Late Archaic San Pedro Stage. Research goals, methods, and results are described and integrated with previous knowledge of the site. Flotation analysis has revealed maize, demonstrating that agriculture was already part of the subsistence economy. A complex stratigraphic record is documented and ordered with new radiocarbon dates on maize. Implications for understanding the cultural ecological and environmental context of the adoption of agriculture in the arid Southwest are considered.

**Huckell, L. W. (see Huckell, B. B.)** [05]

*Hudson, Jean (UC-Santa Barbara)*

[57] THE EFFECTS OF TRADE AND SHARING ON BODY PART DISTRIBUTION: AN AKA EXAMPLE

Ethnoarchaeological research on the faunal remains of hunter-gatherers suggest that multiple factors influence body part distribution. Research among the Aka pygmies, who primarily hunt small game, indicates that factors other than animal size and the logistics of transport can play a role in determining the spatial patterning of faunal remains. This paper explores the effects of subsistence trade, food sharing, scavenging by dogs on the distribution of skeletal elements. Emphasis is placed on linking specific processes with their archeological correlates.

*Huelsbeck, David R. (Pacific Lutheran)*

[43] WHALE BONES, TAPHONOMY, AND THE QUESTION OF WHALE HUNTING

During the Historic Period, some Native Peoples along the Arctic and North Pacific coasts of North America were observed hunting and capturing whales. Other peoples apparently did not hunt whales but did exploit drift whales. The archaeological identification of whale hunting (vs. use of already dead whales) has troubled several authors and has significant implications for the analysis of prehistoric coastal economies. The taphonomy of whale remains at the Ozette site (a documented whaling village, coastal Washington state) is summarized, highlighting indicators of whale hunting. Definite and potential indicators do exist but much of the evidence is equivocal.

*Huffman, Jim and Carl J. Phagan (Northern Arizona)*

[33] ARCHAEOLOGICAL EVIDENCE ASSOCIATED WITH A NEWLY REPORTED BARRIER CANYON-RELATED ROCK ART STYLE IN THE WESTERN GRAND CANYON

Survey in the western Grand Canyon/Arizona Strip area in 1988 and 1989 by Northern Arizona University has greatly improved understanding of archaeological variability in the area, both on the Kanab Plateau and the Esplanade benchlands. Implications of this variability for changing subsistence patterns are discussed. Particular attention is directed toward the associations of archaeological remains with a recently reported "Barrier Canyon-related" rock art expression in the area.

*Hughes, Richard E. (California State-Sacramento)*

[42] OBSIDIAN SOURCE USE IN GREAT BASIN ALPINE ENVIRONMENTS

Much of what is known about obsidian use in the Great Basin comes from a small number of caves and rockshelters proximate to lowland lakes, marshes, and rivers. Recent source analysis of several hundred obsidian artifacts from atop Mt. Jefferson, central Nevada, and the White Mountains, eastern California, illustrates the ways high-elevation living influenced the acquisition and use of obsidian in both areas, as well as how source-use patterning in these alpine sites articulates, and contrasts, with patterns observed at lowland sites.

*Hughes, R. E. (see Beck, C.J.) [07]*

*Hughes, Wilson W. (Garbage Project-Bureau of Applied Research)*

[60] ARCHAEOLOGICAL TECHNIQUES AND MODERN REFUSE ANALYSIS

Most archaeological sites contain a wealth of information on human behavior and culture encoded as broken, discarded, debris and wastes—trash and garbage. Since 1973, the Garbage Project has recorded characteristics of modern refuse in various recording formats for a number of specific applied purposes. These include the examination of fresh household refuse and recently buried refuse in landfills. This paper explains how these modern approaches to archaeological data recording can inform on archaeological recovery techniques in general.

*Hunt, Eleazer D. (SUNY-Buffalo)*

[49] PATTERNS OF LATE WOODLAND VILLAGE SETTLEMENT IN SOUTHWESTERN NEW YORK STATE: AN ECOLOGICAL APPROACH

The Late Woodland period of the eastern Lake Erie Basin contains evidence of a "rapid" adoption of a Swidden system or horticultural subsistence. The unique physiographic conditions, Lake Effect, and long term climatic episodes, produce a mosaic of ecological zones best suited for the production of cultigens. The question is: do the settlement patterns reflect this mosaic and are there any trends in the location and subsequent relocation of villages? 108 recorded Late Woodland village sites from southwestern New York State provide one database for testing.

*Hunt, Terry L. (Hawai'i)*

[84] VARIATION IN AGRICULTURAL PRODUCTION AND EVOLUTION OF SOCIO-POLITICAL COMPLEXITY IN THE HAWAIIAN ISLANDS

By the close of Hawaiian prehistory in 1778 a complex socio-political hierarchy had evolved. This paper expands upon the work of Hommon and Kirch and explores some of the dynamic elements

(from evolutionary ecology) in this change. In particular, the potential for spatial and temporal variability in agricultural production is examined. I argue that groups in zones susceptible to the greatest stochastic variance in productivity played a seminal role in the evolution of socio-political hierarchy. This conclusion calls into question the conventional anthropological notion that wealth (and its environmental basis) supports the growth and maintenance of complex society.

*Hurd, Gary S. and Michael E. Macko (The Keith Companies)*

[68] ROCKS, BONES, BITS, AND MEGABYTES: THE IRVINE COAST DATABASE

Data are synthetic representation which, in aggregate, may be selected to describe objects to processes. Objects may range in complexity from a bone or rock to that of a site or region. A data management system based on commercially available hardware and software is presented. This system performs the integration of remote sensing, field, and laboratory data resulting from excavation of over 2000 cubic meters. The resulting data base of over 100 megabytes is expanded and subjected to graphical and statistical analysis. Rapid turnaround time allows modification of field or laboratory procedures, improving productivity and accuracy.

*Hurd, G. S. (see Peterson, M. L.) [68]*

*Huttlies, A. (see Cordy-Collins, A.) [77]*

*Hyder, William D. (UC-Santa Barbara)*

[33] LOCATIONAL ATTRIBUTES IN ROCK ART STUDIES

Rock art research is moving into the mainstream of archaeological studies as best exemplified by research trends in southern Africa and Australia that rely on the archaeological context of rock art sites to understand rock art data. Drawing upon more traditional approaches to the study of archaeological data, I explore the use of locational attributes in the analysis of North American rock art sites using data from the California Chumash area. These attributes, derived largely from survey data, have proven particularly useful in testing functional hypotheses derived from the existing body of traditional rock art studies based upon ethnographic analogies.

*Jacknis, Ira (The Brooklyn Museum)*

[23] THE WORLD'S COLUMBIAN EXPOSITION AND NORTHWEST COAST INDIAN CULTURE

Before the Chicago Fair in 1893 the study of Northwest Coast Indian culture was barely developed; it was so influential that much of the field can be traced directly to it. This paper examines its personal significance in the lives of Franz Boas and George Hunt, and its place in the arenas of ethnological research, artifact collection, exhibition, ethnic performance, and music recording. It also looks at its impact on the Kwakiutl Indians who demonstrated at the Fair and its continuing legacy for their culture.

*Jackson, Lawrence J. (Northeastern Archaeological Services)*

[86] PALEOINDIAN LACUSTRINE ADAPTATION AND EVIDENTIAL CRITERIA: A CASE STUDY FROM SOUTHERN ONTARIO, CANADA

Intensive survey in the Rice Lake region of south-central Ontario, Canada has begun to document an unusual Lacustrine adaptation for the Early Paleoindian period. While a few major sites of this time period have previously been located along proglacial Great Lakes strandlines, the nature of interior settlement and subsistence has remained unknown. A series of small sites using distinctive raw materials and dating to the period 11,000–10,600 B.P. is discussed from the western margins of Rice Lake. Direct subsistence evidence supports use of unexpected lake-edge resources.

*Jackson, L. J. (see Thacker, P.) [40]*

*Jackson, Louise (UCLA)*

[11] HOUSEHOLD NECESSITIES OR "THINGS THAT THE NATIVES DID NOT IN THE LEAST NEED": TEACUPS AND CULTURE CHANGE IN NINETEENTH CENTURY SOUTHWESTERN ALASKA

An artifactual reflections of contact, trade goods merit a central place in the analysis of culture change and Western impact. Nineteenth century British ceramics from Eskimo and Indian habitations in southwestern Alaska and the associated tea complex will be used to explore issues such as changing subsistence and social practices, and the adoption of an alien economic system. The type of contact—first hand/ indirect, intermittent/ sustained, voluntary or forced—will be considered alongside regional accessibility and the motives, goals, strategies and tactics of contact participants.

*Jackson, Robert J. (SHPO-California)*

[78] THE ROLE OF RESEARCH DESIGNS IN CULTURAL RESOURCE MANAGEMENT ARCHAEOLOGY

Many archaeologists regard Cultural Resource Management as an intellectually impoverished business pursuit bearing little resemblance to academic research. The development of thoughtful research

designs, fundamental to archaeology conducted under the authority of Section 106 of the National Historic Preservation Act, should eliminate such attitudes and distinctions. So why do these attitudes persist? This paper discusses the need for research designs, their potential contribution to archaeology, and possible explanations for their failure to eliminate the distinction, real and imagined, between Cultural Resource Management and research archaeology.

*Jackson, R. J. (see Skinner, E.) [33]*

*James, Steven R. (Arizona State)*

[59] HOHOKAM FAUNAL ASSEMBLAGE VARIABILITY AND SETTLEMENT PATTERNS IN THE AMERICAN SOUTHWEST

Settlement pattern research in the Southwest, until recently, focused primarily on major habitation sites. Further, the concern with subsistence as a part of settlement patterns was generally considered of secondary importance. Even when subsistence research was conducted, it was directed toward agricultural remains, whereas prehistoric hunting patterns in settlement archaeology were often neglected. The potential of archaeofaunal assemblages for understanding certain aspects of settlement patterns in the Southwest is illustrated through differences in assemblage sizes and variability in butchering patterns from Hohokam sites in southern Arizona.

*Janetski, Joel (Brigham Young)*

[07] THE ROLE OF LAKE EDGE RESOURCES IN HUNTER-GATHERER SUBSISTENCE: FAUNAL EVIDENCE FROM THE EASTERN GREAT BASIN

Lacustrine systems in the Great Basin and elsewhere were attractive to hunter-gatherers due to the concentrated wild plant and animal foods available there. Utah Valley in the eastern Great Basin contained a rich lowland fresh-water fishery and extensive marshlands located at the base of the Wasatch Front. Numerous archaeological sites dated to the early Late-Prehistoric (A.D. 1350–1450) ring the edge of the lake, suggesting the importance of these wetland resources to prehistoric peoples. This paper presents faunal evidence from test excavations at several of these sites. In addition to providing information on prehistoric diet, these data provide insights into procurement and processing activities, season of site use and mobility strategies.

*Jochim, Michael A. (UC-Santa Barbara)*

[86] LAKESIDE ADAPTATIONS IN THE SOUTH GERMAN MESOLITHIC

The role of lakes in human adaptations in temperate and boreal forests is marked by pronounced variability. This variability, together with the dynamic depositional environments of lake edges, complicates archaeological interpretations of prehistoric lacustrine adaptations. Recent work on the Paleolithic and Mesolithic of the Federsee, a south German lake, will be used to explore this variability and to place this lake into the broader context of late- and postglacial subsistence and settlement patterns in this area.

*Jochim, Michael A. (UC-Santa Barbara) [Discussant 53]*

*Joesink-Mandeville, LeRoy V. (California State-Fullerton)*

[09] THE INTERFACE OF FORMATIVE CERAMIC TRADITIONS IN HONDURAS: THE PERSPECTIVE FROM YARUMELA

Early Honduran ceramics, viewed from the perspective of Yarumela, offer an opportunity for the analysis of an interface amongst various New World Formative ceramic traditions. Three components are especially prominent in this interface: 1) a local stone-vessel carving tradition, revealing the indigenous origin of the famed Ulua carved marble bowls and vases of the Late Classic; 2) the intrusion of an ultimately South American Tropical Forest derived ceramic tradition; and 3) Mesoamerican influences from the Olmec and Tilatilco style ceramic complexes.

*Johannessen, Sissel (Minnesota)*

[71] FOOD AS METAPHOR IN THE FOOD-SYSTEMS OF THREE MISSISSIPPIAN CULTURES

The plant remains recovered from archaeological sites reflect not only prehistoric diet but food-systems enmeshing material, social, and religious dimensions. For the Mississippian period of the Eastern Woodlands, paleoethnobotanical analyses are delineating areal differences in aspects of the food systems not attributable to environmental constraints. The pattern of the Cahokia area, for example, exhibits conservatism in the crops grown, while the Ohio Valley Fort Ancient people adopted a mode of eating quite different from their predecessors. I examine the food-systems of three Mississippian cultural areas: Cahokia, Moundville, and the Ohio Valley. I consider the variation in ways of eating in relation to cultural and political differences, as well as similarities that reflect "Mississippian" values shared by the people of the three cultural areas.

*Johnson, Ann M. (National Park Service)*

[78] RESEARCH DESIGNS AND SECTION 106: THE VIEW FROM DENVER

According to current Guidelines, all Federal projects must have research designs. Yet many projects in the National Park Service are so limited in their scope and funding that full blown stand-alone research designs are overkill. A work plan encompassing the required salient points satisfies the legal requirements. For larger projects, the most common research design problems are the contractor's unfamiliarity with the regulations and laws, misuse of terminology particularly effect and mitigation, and failure to tailor the research design to the particular project.

*Johnson, John (Santa Barbara Museum of Natural History), Daniel O. Larson (California State-Long Beach) and Joel Michaelsen (UC-Santa Barbara)*

[11] CLIMATIC VARIABILITY, RESOURCE PRODUCTIVITY, MISSIONIZATION IN SOUTH CENTRAL CALIFORNIA: EXPLANATORY CONSIDERATIONS

Recent dendroclimatic research in southern California reveals extreme shifts in climatic conditions between A.D. 1730 and 1820. This interval is characterized by a favorable climatic episode which is followed by severe drought at the advent of the Mission Period. Patterns of recruitment as revealed in the baptism records are compared with reconstructed rainfall data to determine the role of resource stress in promoting Chumash migrations to Mission agricultural communities.

*Johnson, L. Lewis (Vassar)*

[85] PROJECTILE POINT VARIATION IN THE ALEUTIAN ISLANDS: QUESTIONS OF TIME AND SPACE

Seriation of sites in the Aleutian Islands has proven difficult because bone tools are often not preserved and projectile points have not been shown to vary consistently through time. Shape and size analyses of points recovered in a stratified site on Chernabura Island, Shumagin Islands, Alaska have revealed that there are changes in time. These results are compared to collections from elsewhere in the Aleut culture zone to reveal variation that will prove useful in cultural reconstruction in the islands.

*Johnson, Matthew (Sheffield)*

[31] TECHNICAL AND SOCIAL SYSTEMS IN ENGLAND: 1400–1700 AD

It is argued that there is no such thing as 'technology'; rather, technical systems are one aspect of the social structure and cultural logic of a society. This is illustrated by considering timber-framed architecture in England, AD 1400–1700. The craft tradition both transforms itself and weakens through time, as distinctions between the surface and essence of a building, its construction and the meanings it carries, and the craft process and final product develop. These changes are closely related to changes in spatial organization and factors affecting changing contemporary views of the house and household, such as the rise of individualism and a capitalist world view.

*Johnson, Michael (Fairfax County Archaeologist)*

[26] MANY RELIC HUNTERS ARE PEOPLE TOO

Northern Virginia faces degradation of its Civil War sites due to development and relic hunting. The same individuals who are often responsible for such site destruction demonstrate a deep concern about preserving our past, as was reflected, for example, in their strong opposition to the development of a shopping mall near Manassas National Battlefield Park. The Fairfax County Archaeologist has attempted to use these preservation sentiments to the benefit of archaeology by proposing to the Northern Virginia Relic Hunter Association that it start a site recording, reporting, and steward program. Early results of this effort will be presented, as will some comments of commonly held archaeological attitudes toward relic hunting and relic hunters.

*Johnston, Susan A. (Pennsylvania)*

[33] SYMBOLIC AND SPATIAL ASPECTS OF PREHISTORIC IRISH PETROGLYPHS

Irish petroglyph sites (c. 2500–1500 b.c.) show a different distribution pattern from other contemporary ritual sites, particularly burials. Variation in contemporary burial types can be used to indicate regional levels of cultural affiliation. Irish petroglyphs show no such regional groupings, instead indicating a level of uniformity which is "pan-Irish" in extent. Petroglyphs thus cross these regional boundaries, providing a level of cultural affiliation which encompasses them. Such a pan-Irish level of affiliation has not been argued for this period, and may have facilitated the movement of people across local cultural boundaries.

*Jones, III, James Richard (Indiana DNR)*

[11] ARCHAEOLOGICAL AND ETHNOHISTORIC EVIDENCE OF POTAWATOMI OCCUPATIONS IN A "REFUGE" AREA IN NORTHWESTERN INDIANA

The major Potawatomi occupation of present-day northern Indiana occurred during the last third of the 18th century and persisted in this "refuge" area until ca. 1840. Physiographically, this area

includes lake, moraine, till plain, and other glacial characteristics. Historic and ethnohistoric information was examined to posit a preliminary Potawatomi settlement pattern, with particular emphasis on the Kankakee River drainage. Archaeological evidence and results of a preliminary survey of Potawatomi occupations in northwestern Indiana are discussed. Acculturative status of the Potawatomi is also examined, especially in terms of artifacts. The strengths and weaknesses of the historic and archaeological records of the area are considered and evaluated.

*Jones, G. T. (see Beck, C.) [07]*

*Jones, John G. (Texas A&M)*

[25] PRECERAMIC SUBSISTENCE PATTERNS ON THE CENTRAL COAST OF PERU: THE COPROLITE EVIDENCE

Analysis of 92 human coprolites from four middle to late Preceramic Sites on the central Peruvian coast has revealed a varied diet. Cultigens were rare in the coprolites, and the dominant components were small fish and terrestrial plants. Perhaps most surprising was the role that grass played in the ancient Peruvian diet, where traces were encountered in nearly all of the samples from the sites of Paloma 613, Chilca I and the Asia Beach site, though were rare in the coprolites from El Paraiso. Other differences in the diet at the monumental architecture site of El Paraiso may reflect socio-political differences.

*Jones, Timmothy W. (Arizona)*

[60] THE QUESTION OF MEANING IN ARCHAEOLOGY: PROCESSUAL OR POST-PROCESSUAL

Data from the Garbage Project has unique characteristics to address the processual/postprocessual debate. Garbage Project data can be used to compare respondent statements and material representations of behavior while simultaneously knowing the meanings important to the individuals for the same behavior. With this capability this paper will discuss the linkages between meaning, actual behavior, and stated behavior that can be derived from the study of food use among Tucson households and the application of this understanding to archaeology.

*Judge, W. James (Fort Burgwin Research Center)*

[13] SAVING THE PAST FOR OURSELVES

There is a qualitative gap between what we archaeologists do and what the public thinks we do. Many archaeologists fail to recognize that the public is the primary audience to which we should be responsible. Thus, our profession is little more than a small, esoteric, self-perpetuating community of scholars with virtually no contact with or care about its true constituency. We convince ourselves that what we do is somehow anthropologically relevant and thus need not be justified in any other context. In order to save the past for the future, we must save it for someone other than ourselves.

*Judge, W. James (Fort Burgwin Research Center) [Discussant 17]*

*Julien, Daniel G. (Texas-Austin) and Mary Owens (Brandeis)*

[77] MIDDEN EXCAVATIONS AT PIKILLAQTA, PERU, 1989

Excavations were conducted in a midden located outside one of the main perimeter walls of the site of Pikillaqta. Artifacts recovered include locally manufactured ceramics in both Wari and non-Wari styles and probable imported ceramics. The excavations also revealed living floors and terraces. Some of this material predates the major structures and may have been left by construction crews. Analysis of the artifacts recovered should help to date the construction of the site more precisely. It should also yield information on interaction between regions of Peru at the time of the Wari empire and on the impact of the Wari occupation on the local population.

*Kaczor, Michael (Soil Conservation Service)*

[37] SAVING THE SOIL AND ARCHAEOLOGICAL SITE PROTECTION OPPORTUNITIES

The Soil Conservation Service is a technical assistance agency of USDA that is involved in soil and water conservation. Several kinds of conservation applications and USDA programs can be useful tools in the preservation of archaeological sites. These include soil and hydrological engineering, protective vegetation covers, conservation easements, geophysical prospecting, and even employee training in cultural resources.

*Kafati, Z. (see Davis, J.) [47]*

*Kalasz, S. M. (see Zier, C. J.) [72]*

*Kamp, Kathryn and John Whittaker (Grinnell)*

[73] VIEW FROM THE TRENCHES: THE DIRT ABOUT SINAGUA SOCIAL ORGANIZATION

While numerous Sinagua sites have been excavated, only a few have been well-reported and published. Substantive analyses of the excavated data are even rarer. This paper comments on past and

present views of Sinagua ethnicity, social organization, and inter-regional interactions using recently excavated data from Lizard Man Village and comparative materials from the archives and collections at the Museum of Northern Arizona.

*Kane, A. (see York, R.) [52]*

*Kang, Bong-won (Arizona State) [Discussant 19]*

*Kardulias, P. Nick (Kenyon)*

[06] OFFSHORE ISLANDS AND THE EXPLOITATION OF MARGINAL ZONES IN BRONZE AGE AND LATE ANTIQUE GREECE

In 1988 and 1989 a crew of Ohio State archaeologists conducted a survey on the small island of Evraionisos in the Saronic Gulf, Greece. Despite the lack of natural sources of drinking water, surface materials indicate the presence of components from Mycenaean through Early Modern on various parts of the island. Four large sites were identified and sampled. Recorded features include a number of caves occupied primarily in Medieval times, cisterns, and a Turkish fortification. The pattern of exploitation and its implications for economic conditions in the Late Bronze Age and the Late Antique/Byzantine transition period are discussed.

*Kay, Marvin (Arkansas)*

[75] A REGIONAL ASSESSMENT OF HUNTSVILLE MOUNDS IN THE WESTERN OZARK HIGHLAND

This mid-13th century AD site is one of three known White River drainage civic-ceremonial centers. Platform mound stratigraphy, charnel and residential house construction show continuities with Arkansas River drainage centers to the southwest. House wall trench architecture, a Huntsville diagnostic, is also noted at Spiro in the Arkansas drainage but not at Loftin, downstream from Huntsville. Within the context of the two drainage systems, these centers may represent one of two alternative settlement strategies by complex agrarian societies: (1) progressive, northeastward colonization by late Harlan phase communities of the western Ozarks; or (2) stochastic fluorescence of individual communities during Harlan and subsequent Spiro phases.

*Kealhofer, Lisa (Pennsylvania)*

[11] ACCULTURATION AND INSTITUTIONAL DIVERSITY ON THE SPANISH COLONIAL FRONTIER: ARCHAEOLOGY IN EL PUEBLO DE LOS ANGELES

Recent analysis of historical archaeological assemblages from the Plaza of El Pueblo de los Angeles (California) addressed the issue of inter-institutional variability in acculturation patterns on the Alta California frontier. The three primary institutions of the Spanish colonial frontier were missions, presidios (forts), and pueblos (planned towns). The results of analysis indicate that the pattern of faunal and artifactual material within the pueblos is quite different from that found in missions and presidios. How this patterning varies institutionally and its significance for understanding the trajectory of frontier development in Alta and Mexican California will be evaluated.

*Kearns, Timothy M. (Division of Conservation Archaeology)*

[79] ACERAMIC SITES AND ARCHAIC OCCUPATION ALONG THE MIDDLE SAN JUAN RIVER

Recent survey data incorporating hundreds of sites from southeast Utah and southwest Colorado is used to examine the role of aceramic sites in the archaeology of the middle San Juan River area and provides new insight into the Archaic Period occupation of the Four Corners region. The aceramic site data are summarized emphasizing chronology, settlement variability and cultural affiliation. These data are compared with those from other portions of the northern Colorado Plateau to generate an evaluation of Archaic Period and Basketmaker II adaptations.

*Kearns, T. M. (see Wollin, J.) [79]*

*Keegan, William F. (Florida Museum of Natural History)*

[62] INTERACTION AND THE DEVELOPMENT OF SOCIAL COMPLEXITY IN THE NORTHERN CARIBBEAN

The Northern Caribbean is a geopolitical region centered in Hispaniola and encompassing a Jamaican, Cuban, Leeward Island, and Bahamian periphery that originated after A.D. 800 with the final expansion and concurrent development of chiefdoms by the Tainos. Taino chiefdoms employed the principles of matrilineal descent and avunculocal residence. Archaeological and ethnohistoric evidence for the Bahamas reveals differences in the scale of interaction along networks employed in the sociopolitical manipulation of kinship: warfare, marriage, ceremonial reciprocity, and commercial transactions. It is argued that the network emphasized reflects differences in sociopolitical integration and in the degree of autonomy from the geopolitical core.

*Keeley, Lawrence H. (Illinois-Chicago) and Daniel Cahen (Institut Royal des Sciences Naturelles de Belgique)*

[70] AN EXAMPLE OF VILLAGE SPECIALIZATION IN THE EARLY NEOLITHIC OF NW EUROPE

A study of ceramic and lithic artifact distributions at three Early Neolithic [Linear Pottery] villages in NE Belgium indicates that each of these villages had some degree of specialization in the production of certain craft products. The different specializations thus far documented include flint blade production, adze production, ceramics, and one aspect of hide/leather production. The mechanisms by which these products were exchanged is unclear but centralized redistribution of adzes is indicated.

*Keeley, Lawrence H. (Illinois-Chicago)* [Discussant 55]

*Kelley, K. B. (see Begay, R. M.)* [08]

*Kelly, Robert (Louisville)*

[86] THE ARCHAEOLOGY OF GREAT BASIN WETLANDS: SUBSISTENCE, SEDENTISM, AND STORAGE

This paper provides an overview of current research on the prehistoric use of wetlands in the Great Basin of western North America. Through the use of resource transport cost models and models drawn from evolutionary ecology, current research focuses on the effect wetlands have on settlement strategies and storage strategies; in particular, the use of wetlands in a desert environment alters current understanding of the origin of sedentism among hunter-gatherers. This paper argues that sedentism is not the product of resource abundance, but is the product of local resource abundance/storage in a context of regional resource scarcity.

*Kemrer, Meade F. (Division of Conservation Archaeology)*

[79] AN APPRAISAL OF SEISMIC SURVEYS AS SYSTEMATIC SAMPLES: THE CHUSKA ENERGY SEISMIC PROJECT

The Chuska seismic project includes approximately 800 miles of systematically arrayed seismic lines that have been surveyed within the archaeologically rich Four Corners region. Data analyses emphasizing sample reliability are presented. Estimates of site and cultural/temporal reliability are utilized to protect archaeological content within the study area.

*Kent, Susan (Old Dominion)*

[82] THE PROXEMICS OF ABANDONMENT BEHAVIOR AMONG KALAHARI HUNTER-GATHERERS

The effects of site proximity and abandonment behavior is explored using Kalahari hunter-gatherers as an ethnoarchaeological case study. A content analysis of the objects left at particular loci is compared among sites which have been abandoned for various lengths of time. This information is used to contrast sites which are located at varying distances to other occupied camps. The effect of distance on abandonment is discussed. Of particular interest is the recycling or abandonment of specific objects by occupants in relation to the distance of nearby occupied camps.

*Keyser, J. (see Brady, T. J.)* [52]

*Kidder, Tristram R. (Tulane)*

[69] THE TIMING AND CONSEQUENCES OF THE INTRODUCTION OF MAIZE: AGRICULTURE IN THE LOWER MISSISSIPPI VALLEY

Archaeologists in the Lower Mississippi Valley have generally assumed that corn, beans, and squash provided the subsistence stability and the surpluses necessary for the development of the complex, stratified polities which exist during the Coles Creek period. Recent research indicates that maize was probably not an important part of the diet until after this period. Therefore, the introduction of maize-based agriculture had little impact on the formation of chiefdoms in Coles Creek culture. In this regard Coles Creek is very different from early Mississippian; it is a distinct adaptation to the highly productive environment of the Lower Mississippi Valley.

*Killam, W. R. (see Phillips, B.)* [78]

*Kimberlin, J. (see Ericson, J. E.)* [33]

*King, Eleanor (Pennsylvania)*

[36] MAYA HOUSEHOLD ORGANIZATION AND THE PROBLEM OF ISOLATED MOUNDS: A PERSPECTIVE FROM COLHA, BELIZE

Investigations in the Maya lowlands have suggested that the basic household unit is represented by the patio group. While isolated "housemounds" occur at Maya sites, their function as dwellings and even their apparent isolation have been questioned. In the settlement of Colha, a specialized

chertworking site in northern Belize, single mounds seem to predominate. Excavations indicate that at least some of these mounds were dwellings, many of them associated with workshops. These dwellings appear to be contemporaneous with neighboring patio groups, but unconnected to them. This evidence raises the possibility that occupational specialization may have affected traditional Maya household organization.

*King, E. (see Mitchum, B.)* [47]

*King, Ronald F. (Nevada-Reno)*

[35] CONCEPTUAL UNITS AND THE "SHASTA COMPLEX" OF INTERIOR NORTHERN CALIFORNIA

Recent research, systematically designed to address the general use of unit concepts through a case study of local environments and associated assemblages, has examined the Shasta Complex, both as an assemblage and as a conceptual unit. The examination was focussed within the geographical boundaries recognized by previous researchers for this complex, an area occupied by a single subgroup of the Wintu during the ethnographic times. Instead of finding the Shasta Complex, this study demonstrated the nature of problems created by such unit constructs and the need for less arbitrary units based on the analyses of local sequences.

*King, Thomas F. (Advisory Council on Historic Preservation)* [Discussant 03]

*Kintigh, K. (see Goldstein, L.)* [27]

*Kirch, Patrick (UC-Berkeley)* [Discussant 84]

*Kirk, Trevor (Sheffield)*

[31] SYMBOLIC TEXTS AND GENDER RELATIONS: EARLY FARMERS IN N. FRANCE

Drawing upon a critical reading of Lacan and Kristeva, the paper will assess the centrality of language and other forms of symbolic 'text' (eg material culture) to the entry of the child into the Symbolic Order and to the recursive constitution of the subject throughout the life-cycle. Through reference to neolithic north-western France it will be questioned whether the 'law of the father' represents a universal Symbolic Order. In this way it is hoped to facilitate a critique of both past and present forms of Symbolic Order, particularly as they pertain to the Mediation of gender relations.

*Klein, Cecelia F. (UCLA)* [Discussant 64]

*Klein, K. (see Todd, L. C.)* [08]

*Klesert, A. L. (see Benallie, L.)* [08]

*Knecht, Richard (Kodiak Area Native Association)*

[34] EXCAVATIONS OF RUSSIAN-KONIAG CONTACT PERIOD SITES ON KODIAK ISLAND

In concert with the Kodiak Area Native Association, archaeological study of several contact period sites on Kodiak Island have been undertaken in an overall effort to preserve and understand the history and prehistory of the Koniag peoples. Results of these excavation projects will be discussed from the perspective of an understanding of how the native peoples adapted to the intrusion on their lifestyle brought about by the Russian-American Company. The overall cooperative program provides a notable example of the benefits of the active participation of the Koniag people in an effort to instill their culture in the new generation to include archaeological research.

*Knight, Terry (Laboratory of Anthropology)*

[15] LARGO-GALLINA CERAMICS: INTER/INTRA SITE VARIABILITY IN CULTURAL AND TECHNOLOGICAL ATTRIBUTES

The Vicenti Site (LA14318) is a Largo-Gallina residential village in the La Jara National Register District, thirty miles northwest of Llaves, New Mexico. During the 1970's New Mexico State University and the Jicarilla Tribe excavated three residences and one community structure at LA14318. The analysis of 6000 ceramic artifacts from these features was detailed by differentiating 176 variable states of 23 cultural-technological attributes. This data is compared to historic type descriptions and ceramic data from other sites in the region, toward quantification and the demographic implications of inter and intra-community variability in ceramic design and technology.

*Koch, Amy (Nebraska-Lincoln)*

[53] STONE TOOLS FROM THE ALLEN SITE (23FT50)

Excavations at the Allen Site in the late 1940's produced an assemblage of stone tools which differs dramatically from that found in other Paleoindian sites on the Plains. Among the flaked stone, projectile points are extremely variable and often non-diagnostic, and large, useable tools, including classes of tools previously unrecorded in sites of this size, are common. In contrast, grinding stones

are few, small, heavily worn, often resharpened, and fragmented. This paper describes the assemblage from the site and compares it to assemblages from other Early Holocene sites on the Plains.

*Koda, Yae (UC-Berkeley)*

[76] WOODEN FARMING IMPLEMENTS FROM THE SOUTH COAST OF PERU

Some of the most intriguing artifacts from the prehispanic coastal Peru are a group of wooden objects found around the Ica Valley. A stylistic and usewear study, based on an experiment, found their use in soil. Together with the information as to the manner of use, some of these artifacts were interpreted to be farming implements. The experiment, although limited in scope, produced several kinds of wear, including polish and "matted surface", from different soil types, which are similar to those seen on the Peruvian tools.

*Koerper, P. (see Holstein, H.) [11]*

*Koetje, Todd A. (SUNY-Stony Brook)*

[83] A SIMULATION APPROACH TO RECOVERING ARCHAEOLOGICALLY MEANINGFUL LEVELS

Intrasite archaeological spatial analysis has very rarely been applied to artifact distributions in three dimensional space. One of the more difficult problems encountered in dealing with fully three dimensional data is the recovery/creation of levels or layers within a site that are appropriate for further analysis. Under minimal assumptions about the nature of the actual object distribution and the formation and transformation processes affecting it, computer simulation is used to: 1. discover and test quantitative methods that can be useful in the recovery/creation of analytic levels, and 2. characterize the error rates inherent in their use.

*Koetje, T. A. (see McKelway, H.) [83]*

*Kohler-Rollefson, Ilse (San Diego State)*

[22] STAGES IN PASTORAL DEVELOPMENT DURING THE LEVANTINE NEOLITHIC

The evolution of Levantine Neolithic animal exploitation systems can be modeled according to the following general pattern: The sedentary hunting economy of the Pre-Pottery Neolithic A period developed into the village-based animal husbandry of the Pre-Pottery Neolithic B period which then was supplanted by specialized semi-nomadic pastoralism during the Pottery-Neolithic period. The ecological, social and economic features of each of these stages will be evaluated in light of archaeozoological data from three Neolithic sites in Jordan, and within the wider context of Neolithic investigations in the Levant.

*Komorovsky, J. (see Carr, C.) [22]*

*Kornfeld, Marcel and Mary Lou Larson (Wyoming)*

[72] ARCHAIC PERIOD OCCUPATION OF THE CENTRAL HIGH PLAINS: THE HUTTON-PINKHAM SITE, COLORADO

The Archaic Period on the Central High Plains of North America is only known from sites at its periphery. The Hutton-Pinkham site, located in east-central Colorado is an exception, being the only excavated site in the center of this important region. However, the site has not been reported on extensively and the recovered material has not been fully analyzed. Analysis of the chipped and ground stone, radiocarbon, and bone, and contextual data on geomorphology, geology, and paleobiology of this site is presented. Central High Plains prehistory is substantially augmented with these data and Archaic Period hunter-gatherer adaptations are discussed.

*Kralick, Kolleen (SUNY-Buffalo)*

[22] HISTORICAL ARCHAEOLOGY IN THE BLACK RANGE OF NEW MEXICO: ISOLATED SETTLEMENTS AND ECONOMIC FRONTIERS

Settlement of southwestern New Mexico during the period of intensive mining beginning around 1860 has resulted in the occurrence of enduring townsites, ghost towns, and abandoned isolated settlements scattered throughout the region. This preliminary study analyses the archaeological remains of isolated settlements within the Black Range of Gila National Forest. Surface scatter and oral history are used to determine occupational patterning with respect to the ranching, mining, and homesteading frontiers. The resulting tentative model for predicting major economic activity and duration of occupation will be presented.

*Kramer, Wendy (Warwick)*

[01] THE FALL OF SANTIAGO DE GUATEMALA AT IXIMCHE, 1524–1526

That the Spaniards' erstwhile allies, the Kaqchikel, rebelled is well-known; but because of scant documentary evidence and the conquerors' reluctance to discuss the excessive demands that they

placed on the Kaqchikels, which provoked the uprising, the rebellion has yet to be described satisfactorily. This study, based on new archival research, examines the events surrounding the Kaqchikel rebellion at Iximche, which forced the Spaniards to abandon the first Spanish city established in Guatemala.

*Kramer, W. (see Lovell, W. G.) [01]*

*Kreutzer, Lee Ann (Washington)*

[39] BISON BONE DENSITY AND DIFFERENTIAL BONE SURVIVORSHIP IN THE ARCHAEOLOGICAL RECORD

A statistically significant relationship between bone mineral density and differential bone survivorship in the archaeological record has been demonstrated by Lyman, based on his work with small cervids. These cervid bone density data have been widely applied to other genera in the assumption that rank-ordinal element bone density remains stable across all mammals. Here, the first bone mineral density data for a large bovid, *Bison bison*, are provided. Comparisons are made to the original cervid data, and taphonomic implications are discussed.

*Kudlik, John (Community College of Allegheny County)*

[29] SPATIAL ORGANIZATION OF THE MEDIEVAL SKANIA FAIRS: 1100–1500 A.D.

This paper will examine the spatial patterning of the Skania Fairs, Scandinavia's greatest commercial market/fishery during the Middle Ages. Historical archaeology has been able to reconstruct the complex social, economic, and ecological foundations of these seasonal fairs. Archaeologically recoverable material arrangements here represent not just practical technological considerations, but the maintenance of a highly stratified western Baltic political economic system. Enforced spatial arrangements at the fishery and market mirrored the larger world of the Middle Ages. They functioned to stratify peasants in order to maintain an unequal access to valuable ecological resources.

*Kurchin, Bernice (CUNY-Graduate Center)*

[06] MEASURING THE EFFECTS OF COLONIALISM: ROME IN NORTH BRITAIN

With tools borrowed from economic geography—particularly the rank-size rule—and applied to the archaeological settlement data from both the pre-Roman and Roman periods. I measure the effects of the Roman presence on the economic, social and political development of the peoples in North Britain. The results have implications for future studies of the colonization process.

*Kuznar, Lawrence (Northwestern)*

[25] LATE ARCHAIC LLAMA HERDING IN THE HIGH SIERRA OF THE SOUTH CENTRAL ANDES

Although researchers have investigated early camelid herding in the altiplano of the Andes, (above 3800 m), no investigations consider the domestication and herding of camelids in the high sierra zone between 3400 and 3800 m. Evidence from the site of Asana, Peru, is presented which indicates that guanaco were domesticated in the higher sierra by 4000 BP. This has important implications for animal domestication and economic specialization in the Andes. The hypothesis that specialized alpaca herders occupied the altiplano, and specialized guanaco herders occupied the high sierra is presented.

*Kvamme, Kenneth L. (Arizona)*

[61] ARCHAEOLOGY AND GIS IN THE 21ST CENTURY

At present, the major impact of GIS on archaeology has been in the management of regional databases, although notable simulation, locational analysis, and modeling applications exist. The technology is in its infancy, however, and such issues as data standards, vector vs. raster capabilities, and analysis options are important to the archaeologist. In the 21st century, as a mature technology, this will no longer be the case. Archaeologists will be able to focus on archaeology. Electronic site files linked to maps, areal imagery, photographs, bibliographies, text, and museum collections data are conceivable, as are new ways to approaching and analyzing data sets. Regional and site-specific examples from the western US are explored in this context.

*Ladefoged, Thegn N. (Hawai'i)*

[84] AMERICAN GREEN GROWS BIGGER POTATOES: HAWAIIAN AGRICULTURAL INTENSIFICATION AND THE WORLD ECONOMY

Agricultural intensification in Hawai'i is often attributed to prehistoric sociopolitical development or population growth. The surface remains of the large dryland field systems throughout the archipelago are seen as a direct reflection of these processes. Very little attention has been given to the further elaboration of these field systems during the historic period. Hawaii's incorporation into the world economy spurred the exportation of sweet potatoes to the west coast of America. Research from a

dryland field system at Kalaupapa, Moloka'i suggests that foreign agricultural export was the major impetus for a second period of agricultural intensification.

*Lafferty, Robert, Robert Cande and Michael Sierchula (Mid-Continental Research Associates)*  
**[22] LATE ARCHAIC ADAPTATION TO THE BOSTON MOUNTAIN-SPRINGFIELD PLATEAU INTERFACE IN NORTHWEST ARKANSAS**

Recent data recovery at three sites in the upper White River Basin has resulted in the identification of three specialized kinds of Late Archaic extractive sites. These appear to represent different seasonal exploitations at the end of the Hypsithermal. Preliminary analyses of the tool kits indicate a wider range of support activities than at sites previously considered to have had limited activities. This pattern appears to change radically in the middle of the Late Archaic Stage ca. 1500 B.C., possibly due to the introduction of cultigens.

*Lange, Richard C. and E. Charles Adams (Arizona)*  
**[14] THE EVIDENCE FOR SEASONAL USE OF HOMOL' OVI III, A 13TH AND 14TH CENTURY PUEBLO FROM NORTHEASTERN ARIZONA**

The seasonal use of a 40 room pueblo, Homol'ovi III, during the 14th century is characterized as a product of settlement aggregation and associated redefinition of land use on the Colorado Plateau region of the U.S. Southwest. Survey and excavation data and analogues to historic Pueblo settlement patterns are used to define the nature of the seasonal use of Homol'ovi III and its place in the settlement system of the area. The relation of the appearance of seasonal sites to aggregation on the Colorado Plateau is discussed.

*Langenfeld, Kristin and Douglas D. Dykeman (Navajo Nation Archaeology Department)*  
**[79] A SURVEY OF PREHISTORIC LITHIC RESOURCE PROCUREMENT AREAS ALONG THE MIDDLE SAN JUAN RIVER IN SOUTHEAST UTAH**

For a number of years, archaeologists have noted the presence of distinctive chert, siltstone, and quartzite lithic raw materials on sites in the four corners area. Recent survey work in the vicinity of Aneth, Utah has documented prehistoric quarry sites in association with outcrops of the Morrison and Burro Canyon geologic formations. This paper presents a survey of these sites with an emphasis on procurement, extraction, and reduction strategies. Raw material types and context in geologic formations are documented. Settlement patterns in relation to quarry locales are described and possible explanations for the observed patterning are presented.

*Langenfeld, K. (see Baker, L. L.) [15]*

*LaPoint, H. (see Wettstaed, J.) [30]*

*Lara Pinto, Gloria (Instituto Hondureño de Antropología e Historia)*  
**[01] CHANGE FOR SURVIVAL: THE CASE OF 16TH CENTURY INDIGENOUS POPULATIONS OF NORTHEAST AND MIDEAST HONDURAS**

The systematic conquest and colonization of Northeast and Mideast Honduras began in 1525 with the Spanish colonial foundation of Trujillo. Attempts to conquer and subdue the native inhabitants focused on the valleys of El Aguan, Agalteca, and Olancho, lasting until 1533. During these eight years a series of factors contributed to critical changes in the indigenous sociopolitical structure. Among these changes, population decline and modifications in the settlement pattern stand out. This examination attempts to reconstruct the scenario in which these indigenous societies adopted an effective survival strategy. However, this new, less cohesive strategy exposed the indigenous population to "ladinization" and mestizaje.

*Larralde, Signa (Bureau of Indian Affairs) and Sarah Schlanger (Museum of New Mexico)*

**[59] ANASAZI HUNTING STRATEGIES AS SEEN THROUGH PROJECTILE POINT DISTRIBUTIONS**

Few items of prehistoric Southwestern technology are as widely distributed as the business end of the hunting kit, the stone projectile point. Primarily used as a weapon, complete and broken projectile points occur as surface finds, in trash deposits, on feature and structure floors, and as cached goods. Here we consider the pathways that distribute projectile points among these various archaeological contexts. An integrated model of hunting behavior resulting in projectile point use, discard, recovery contexts. An integrated model of hunting behavior resulting in projectile point use, discard, and loss is used to interpret the distribution of projectile points from several regional research projects.

*Larson, Daniel O. (California State-Long Beach) and Joel Michaelsen (UC-Santa Barbara)*

**[80] CLIMATIC VARIABILITY AND POPULATION GROWTH AMONG THE VIRGIN BRANCH ANASAZI**

The prehistory of the northwestern region of the American Southwest is characterized by population growth, agricultural intensification and specialization, sedentism, increased settlement aggregation,

and abandonment. Recent dendroclimatic research reveals that two major drought episodes, A.D. 1120 to 1150, contributed to significant changes in the adaptive strategies of the Anasazi. The first event forced several adaptive shifts while the second caused regional abandonments. An extremely favorable climatic interval, A.D. 1020 to 1110, may have allowed spring floodplain farming and summer rainfall agriculture. This double cropping strategy may have promoted exponential population growth. Our explanatory framework suggest that the preconditions of population growth and increased dependence on agriculture set the various levels of sensitivity to extreme climatic events and these were the three primary factors operating on the selective behavior of the Anasazi.

*Larson, D. O. (see Johnson, J.) [11]*

*Larson, M. L. (see Kornfeld, M.) [72]*

*Laughlin, S. B. (see Laughlin, W. S.) [34]*

*Laughlin, William S., A. B. Harper and S. B. Laughlin (Connecticut)*

**[34] MASSACRE OF THE MEDVEDEV PROMYSHENNIKS, 1764 AD**

Discovery of the Russian victims of an Aleut massacre in the Chaluka village midden, Umnak Island, confirms the fate of these fur traders. They were killed shortly before Glotov returned from Kodiak where he had risked the same fate. Finding the skeletons and artifacts of Medvedev permits examination of both sides of the dispute between Russian fur traders and the Aleut kayak hunters who were required to hunt for them. The archaeological evidence confirms the Aleut oral tradition and historical accounts. Basic contrast between the Russian and the Aleut ecosystem management programs are illustrated.

*Lawrence, Bob (USFS-Carson)*

**[05] EVIDENCE FOR THE INTRODUCTION OF CORN AND THE BOW AND ARROW INTO NORTHEASTERN NEW MEXICO**

Survey and excavations in Cerrososo Canyon near Cimarron, New Mexico provided evidence that the bow and arrow, corn and circular stone architecture were all introduced into Northeastern New Mexico about A.D. 500. Radiocarbon dates in the A.D. 500's were recovered from non-ceramic sites with corn and stone architecture. Projectile points from these sites are small corner-notched arrow points that provided obsidian hydration dates in the A.D. 500's. Other sites produced radiocarbon dates in the A.D. 400's and larger corner-notched atlatl dart points which provided obsidian hydration dates in the A.D. 400s.

*Lawrence, B. (see Maceus, C.) [15]*

*Lawson, M. (see Todd, L. C.) [08]*

*Leach, Melinda and Robert G. Elston (Intermountain Research)*

**[47] QUARRYING, LITHIC PRODUCTION AND SETTLEMENT AT TOSAWIHI QUARRIES: AN OVERVIEW OF ONGOING RESEARCH**

The Tosawihi Quarries (Elko Co., Nevada) represent the largest, most intensively exploited opalite source known in the Great Basin. Ongoing investigations by Intermountain Research have involved inventory of over 800 acres and testing/data recovery at 66 sites. The field program was guided by research questions phrased to identify strategies of lithic production, define the organization of groups using the quarries, quantify energy expenditure, test transport models, and evaluate long-term variability in quarrying technology. Recent evidence of the antiquity of interest in Tosawihi toolstone includes an opalite Clovis fluted point and Mazama tephra overlying culture-bearing strata and a bedrock quarry pit.

*Lecount, Lisa (UCLA) and Melissa Hagstrum (UC-San Diego)*

**[71] CUISINE, COOKING AND COOKWARE: TOWARD RECONSTRUCTING FOOD-RELATED ACTIVITIES IN THE ARCHAEOLOGICAL RECORD**

Diet encompasses more than just the amount and type of food items available to prehistoric people; it also consists of a traditional cuisine comprising both daily and ritual dishes requiring preparation and tools. This paper explores the possibility of viewing prehistoric culinary practices from archaeological cookware and storage vessels. Ethnohistoric and ethnographic data on cuisine, ceramic use, and vessel form in the central highlands of Peru are used to delineate a set of cooking techniques associated with discrete functional vessel forms. These forms are then tracked through time to view changes in food-related activities.

*Lee, L. M. (see Pak, N.) [84]*

*Leech, Roger H. (Royal Commission on the Historical Monuments of England)*

[66] THE NATIONAL ARCHAEOLOGICAL RECORD FOR ENGLAND: STRATEGIES FOR THE SUPPLY OF ARCHAEOLOGICAL INFORMATION

The National Archaeological Record for England is now fully computerized and is being made available as NAR ONLINE for worldwide access. This paper addresses the problems and possible future development paths for a national record providing database and GIS information. Strategies for the ongoing enhancement of the record, its future use for government mapping program, and its developing relationship to other archaeological and bibliographic databases, are considered alongside those for providing access to specialists and the public.

*Lekson, Stephen H. (Arizona State Museum)*

[80] MIMBRES MULTI-COMPONENTY

Recent synthetic study of southwestern New Mexico identifies two key issues for the area's late prehistoric archaeology: population history and the archaeological interpretation of large, multi-component sites. Demographic reconstructions structure archaeological understandings of Mimbres adaptations, and our techniques for reading large, multi-component sites are fundamental to those reconstructions. A settlement model for multi-componenty is presented and compared to the empirical record of the Mimbres region.

*Lekson, S. H. (see Doyel, D. E.) [17]*

*Lekson, S. H. (see Stein, J. R.) [17]*

*Lekson, S. H. (see Lipe, W. D.) [24]*

*Lentz, David (Mississippi-Jackson)*

[12] ARCHAEOBOTANICAL REMAINS FROM THE COPAN VALLEY, HONDURAS

During the last decade, excavations of prehistoric Maya sites in the Copan Valley generated a large number of flotation samples in an effort to retrieve plant remains from archaeological contexts. The floral content of more than 200 flotation and macrofossil samples have been analyzed from households of varying socioeconomic status and depositional history (ranging from Middle Preclassic circa 900 B.C. to Terminal Classic circa A.D. 1200). Results show that a greater diversity of plant products were exploited during Classic times than in previous periods.

*Leonard, Banks L. (UCLA)*

[25] MOCHE THROUGH LATE HORIZON SETTLEMENT PATTERNS; CHICAMA VALLEY, PERU

Data from the first field season of the Chicama Valley Settlement Survey permit preliminary evaluation of settlement change from the Moche Period to Late Horizon. Study of site locations, irrigation, and irrigation facilities underlie increasing socio-politico-economic complexity until the Spanish Conquest. Increased labor is expended on public works while emphasis shifts from the construction of monuments toward construction of irrigation projects and administrative compounds. New ceramic analyses suggest increasingly industrial production methods with standardization of techniques, forms and styles.

*Leonhardy, Frank C. (Idaho)*

[32] WITH APOLOGIES TO V. GORDON CHILDE: NEW LIGHT ON THE MOST ANCIENT PLATEAU

The Windust Phase, the Phillipi Phase, and related components represent a wide-spread foraging people who occupied the southern Plateau from ca. 11,000 to 8000 yr B.P. The artifact inventory from this period is well enough known that projectile point style and technology are sufficient for assemblage assignment. On this basis, artifacts in the Bergen collection from Atlatl Valley near the Dalles of the Columbia River represent Windust-Phillipi era burials containing stemmed projectile points and oversized, elaborate "atlatl weights" as grave goods. These grave goods represent an artifact elaboration found in many early Plateau assemblages, but one wonders why the most extreme manifestation of this elaboration, even 9000 to 10,000 yr B.P., was at the Dalles.

*Lerner, Shereen (SHPO-Arizona)*

[13] PREVENTING THE PROBLEM OF ARCHAEOLOGICAL SITE VANDALISM

The "Preventing the Problem" workshop was to propose programs to prevent looting. Looting has become so pervasive that it threatens the existence of our nation's heritage resources. The group agreed that the time has come for this to be addressed at a national level. In considering looting, participants discussed the messages that were critical in explaining to the public why it is important to preserve our heritage resources. Three topics were the focus of discussion: volunteers, education

and public outreach programs. This presentation will discuss recommendations concerning these topics, and will provide information on activities undertaken since the workshop.

*Lewarch, Dennis E. (Washington)*

[12] LATE POSTCLASSIC ECONOMIC ORGANIZATION IN THE COATLAN DEL RIO VALLEY, MORELOS, MEXICO

Data from eight Late Postclassic sites in the Coatlan del Rio Valley of western Morelos are used to assess hypotheses about economic organization in rural Aztec tribute provinces. Spatial analyses of intensive, systematic surface collections define over 100 refuse disposal areas representing various size household groups and extramural workshops distributed throughout the region. Quantitative analyses of ceramic and lithic assemblages suggest a complex system of functional organization, production, and consumption. Data from the Coatlan del Rio Valley, combined with results from other recent Aztec period studies, indicate simple normative models of rural Aztec economic organization are inappropriate.

*Lewenstein, Suzanne (the Americas)*

[70] THE LITHIC TOOL KIT OF THE MAYAN MASON: FUNCTIONAL AND ETHNOARCHAEOLOGICAL CONSIDERATIONS

Some years ago Rovner and Andrews described a mason's tool kit of lithic implements from the Classic Mayan era in northern Yucatan. Following the same tradition, the present report focuses on the identification and interpretation of stone masonry tools in Mayan archaeology. The analysis is based on functional lithic analysis and an ethnoarchaeological study of modern masonry specialists and monument restorers in the Yucatan.

*Lightfoot, Kent (UC-Berkeley)*

[34] KONIAGS IN CALIFORNIA: EXCAVATIONS AT FORT ROSS, CALIFORNIA

Recent excavations of sites occupied by Alaskan native peoples (principally Koniags) at the Russian-American Company outpost at Fort Ross, California have greatly expanded our knowledge of these people who were so key to the success of the venture in California. They have generally received short shrift in the historical literature even though they made up the bulk of the population of the settlement. In addition to the recent finds, the scope of an extended excavation program to include cooperative interaction with the Kodiak Area Native Association (KANA) will be discussed.

*Lightfoot, Ricky R. (Crow Canyon Archaeological Center)*

[56] PROCESSES OF ABANDONMENT AT THE DUCKFOOT SITE

This paper presents the results of a study of abandonment processes using archaeological data from the Duckfoot Site, a late ninth century Anasazi hamlet in the Mesa Verde Region of the American Southwest. The goal is to explain the cultural processes that produced the abandonment floor assemblages. Discard (midden) assemblages are used to develop a profile of average annual artifact discard per household. Defacto refuse assemblages from structure floors are compared to the expected assemblages as derived from the midden studies. The results are used to evaluate various theoretical models of abandonment and interpret pre-abandonment activities.

*Lillios, Katina T. (Yale)*

[06] COMPETITION TO CONSOLIDATION: THE COPPER TO BRONZE AGE TRANSITION IN CENTRAL PORTUGAL

The marked shifts in settlement and burial patterns, ceramic technology, and artifact variability that characterize the Copper to Bronze Age transition in Portugal have traditionally been interpreted as culturally 'regressive'. It can be argued, however, that this idea had as much to do with the available data as the ideological context in which archaeological research in Portugal was carried out. A recent investigation of subsistence and settlement patterns with a reassessment of the earlier data suggests that the Bronze Age was, in fact, a period of regional integration associated with increased social complexity, and a formative stage in the development of later Iron Age chiefdoms.

*Limp, W. Fredrick, James Farley, Jami Lockhart, Ishmael Williams and Sandra Parker (Arkansas Archaeological Survey)*

[66] ARCHAEOLOGICAL DATABASES AT THE CONTINENTAL AND STATE SCALE

The Arkansas Archaeological Survey maintains two automated archaeological databases linked to the GRASS GIS and extensive EDA statistical software. The first contains 142,000 archaeological sites with archaeological citations and environmental and economic data for an area encompassing one-fifth of the continental U.S. The second database includes archaeological sites, citations, projects, artifacts, and statewide environmental data for Arkansas. Both databases are fully relational and SQL based. Linkages between these databases and GIS and EDA software facilitate various spatial/

environmental analyses. Intelligent user interface programs simplify the process of formulating SQL queries and manage exchange between components of this integrated data.

*Limp, W. Fredrick (Arkansas Archaeological Survey) [Discussant 78]*

*Lindauer, Owen (Arizona State)*

[22] POSSIBLE FUNCTIONS OF PREHISTORIC DECORATED VESSELS: AN EXAMPLE FROM THE HOHOKAM WHOLE VESSEL STUDY

An analysis of an assemblage of prehistoric whole vessels reveals insights into the general study of vessel function and the possible uses of prehistoric vessels. Simple ratios of measurements are used to divide vessels into broad functional groups which were found to heavily overlap each other. Such overlap may suggest vessels were engineered to serve multiple rather than single functions. Other attributes, including upper vessel shape, aperture, and traces of use-wear are used to suggest that many Red-on-buff vessels were used to store and transport liquids. Finally, functions for assemblages of decorated vessels are proposed and compared at a regional scale to suggest mechanisms of exchange.

*Lindly, John, C. Michael Barton and Steven E. Falconer (Arizona State)*

[22] A PRELIMINARY LITHIC ANALYSIS OF EARLY AND MIDDLE BRONZE AGE INDUSTRIES FROM TWO VILLAGE SITES IN THE LEVANT

Bronze Age village life during the late third to early second millennia B.C. in the Levant has been characterized by a change from non-sedentary pastoralism to urban sedentary agriculture. Recent research, however, suggests similar economic activities and sedentism occurred throughout this period concurrent with marked changes in ceramics and settlement patterns. The lithic industries from the sites of Tell el-Hayyat and Tell Abu en-Ni'a, Jordan indicate a change from blade industries to an ad hoc flake technology. The disappearance of blades may result from changes in the organization of technology with the advent of urbanism.

*Linse, Angela (Washington) and James H. Burton (Wisconsin-Madison)*

[43] BONE SOLUBILITY AND PRESERVATION IN ALKALINE DEPOSITIONAL CONDITIONS

Archaeologists are aware that hydroxyapatite, the major mineral component of bone, is highly soluble in acid environments. Hydroxyapatite is also soluble in alkaline conditions. Experiments with modern mammalian and fish bone were performed to investigate the relationship between bone mineral preservation and alkaline deposits. Deer phalanges and salmon vertebrae were immersed in a spectrum of alkaline solutions with pH values that range from 7.9 (the point at which hydroxyapatite is least soluble) to 13.0. Both bones and solutions were subjected to analysis to examine changes in elemental concentrations. Bone preservation is influenced by the dissolution of hydroxyapatite at pH measurements above 7.9.

*Lipe, William D. (Washington State) and Stephen H. Lekson (Arizona State Museum)*

[24] PUEBLO CULTURES IN TRANSITION: REPORT OF A CONFERENCE

The period A.D. 1150–1350 saw profound changes in Southwestern Pueblo cultures, including major population movements, new patterns of community and regional organization, and the appearance of new symbol systems. The paper summarizes results of a working conference on this period attended by archaeologists from 12 Pueblo subregions, held at the Crow Canyon Archaeological Center in March, 1990. Conference goals were: 1) documenting patterns of change and mapping them in time and space; 2) identifying processes responsible for these patterns; 3) assessing current understandings and future research needs regarding both patterns and processes.

*Lipe, William D. (Washington State) [Discussant 79]*

*Lipe, William D. (Washington State) [Discussant 37]*

*Lippmeier, Heidi (SUNY-Buffalo)*

[63] AN ASSESSMENT AND COMPARISON OF NUTRITIONAL STATUS BETWEEN THE MIMBRES AND BLACK MOUNTAIN POPULATIONS OF SOUTHWESTERN NEW MEXICO

Human osteological remains from the Mimbres area of New Mexico are examined to provide information on nutritional status for Mimbres and Black Mountain populations. Presently, there are various models offered to explain Mimbres population decline, and perhaps replacement, after AD 1130. Environmental change and decline in provisioning potential have been considered indices of nutritional stress at this time. Analysis of skeletal remains from Mimbres and Black Mountain sites in the Mimbres region allows direct assessment of nutritional status and evaluation of models of population change.

*Livingston, Stephanie D. and Fred L. Nials (Desert Research Institute)*

[38] GEOMORPHOLOGY AND ARCHAEOLOGY OF ASH MEADOWS, NEVADA

Recent multidisciplinary investigations in the dunes, spring-fed wetlands, and alkaline desert uplands of Ash Meadows National Wildlife Refuge in the southern Amargosa Desert, Nevada, have focused on dune history and its relationship to meadow environments and the distribution of archaeological sites through time. Sites recorded during survey of a sample of the refuge area and test units excavated at four sites (Fairbanks Dune, Longstreet Dune, Anasazi Dune, and Peat Mine Dune) indicate that occupation of the Ash Meadows area occurred primarily during the last 3500 years. Most prehistoric sites are associated with dune fields that support mesquite stands.

*Lockhart, J. (see Limp, W. F.) [66]*

*Longacre, W. A. (see Neupert, M. A.) [22]*

*Longmire, J. L. (see Williams, S. R.) [61]*

*Lope, C. P. (see Ringle, W. M.) [12]*

*Lopez Varela, Sandra L. (Universidad de las Americas-Puebla/INAH)*

[22] THE YAXCHILAN CERAMIC SEQUENCE AND ITS CULTURAL CONTEXT IN THE MAYA AREA

The Yaxchilan project was formulated in 1973, in order to establish cultural sequences to integrate Yaxchilan to the interpretation of the development and fall of the Maya Lowland civilization. After eleven field seasons, the ceramic catalogue has been completed and it was possible to determine a relative chronology through a ceramic sequence, in order to define inter and intra site distribution, hence giving Yaxchilan its cultural context.

*Louthan, Bruce D. (BLM-Moab District), Dale Davidson and Craig Harmon (BLM)*

[33] CEDAR MESA/GRAND GULCH MANAGEMENT: SAVING AN ARCHAEOLOGICAL TREASUREHOUSE FROM "INDIANA JONES"

The Cedar Mesa-Grand Gulch area has long been noted as an important archaeological research area. The advent of backpacking as a widespread recreation activity and Cedar Mesa as a major destination has raised new threats to the uniquely-preserved dry deposits of the area. Recent proposals for more intensive management will affect both recreational and archaeological future use. Displays and a slide show will illustrate problems and proposed solutions, while discussions and comments will be elicited by the authors. Professional interchange at this national forum will provide feedback/input previously lacking for such proposals with potentially far-reaching ramifications.

*Lovell, W. George (Queen's), Wendy Kramer (Warwick) and Christopher H. Lutz (CIRMA)*

[01] JUAN DE ESPINAR AND THE INDIANS OF HUEHUETENANGO

The present study focuses on the controversial career of a humble Spanish tailor who in 1526 became the encomendero of Huehuetenango, the largest encomienda in the Cuchumatán highlands in northwest Guatemala. In an attempt to increase his quota of Indian tribute and manpower, Espinar kidnapped and punished defiant native lords and forced the Indians of neighboring towns to destroy their ancestral lands and relocate within the boundaries of his encomienda. Early archival documentation—containing testimonies of both Indian and Spanish witnesses—provides insight into Espinar's efforts to make himself the master of the region and the Indians' response to early Spanish domination.

*Lovis, William A. (Michigan State)*

[86] THE POTENTIAL IMPACTS OF ENVIRONMENTAL PERIODICITY ON LATE ARCHAIC LACUSTRINE ADAPTATION IN THE SAGINAW VALLEY OF MICHIGAN

It is now recognized that resource productivity varying at several scales of periodicity can have a marked impact on the way in which human systems organize themselves relative to specific resources and complexes of resources. The Saginaw Valley Late Archaic is a mixed economy focused on lacustrine and wetland resources. These resources vary inter- and intra-annually, as well as on a long term basis relative to postglacial lake level adjustments. The potential effects of these cycles of variability are addressed in an attempt to understand the distribution and abundance of human habitations in the region.

*Lundelius, Ernest L. (Texas)*

[28] PLEISTOCENE AND HOLOCENE FAUNAL HISTORY OF THE SOUTHERN DESERTS OF NORTH AMERICA

The southern desert and semi-desert regions of North America have a great diversity of habitats with a correspondingly diverse fauna. The modern fauna of the entire southern North American region ranges from typical desert adapted forms in the lower elevations to more mesic faunas in higher

elevations. Many of these mesic taxa are isolates of, or are closely related to, species that are more continuously distributed to the north. To the south there is a merging of Neoarctic and Neotropical faunas. The changes in the fauna at the end of the Pleistocene include the extinction of many large mammals and the disappearance from this region of some extant taxa now characteristic of more mesic areas.

*Lutz, C. H. (see Lovell, W. G.) [01]*

*Lyman, R. Lee (Missouri-Columbia) [Discussant 32]*

*Lyneis, Margaret M. (Nevada-Las Vegas)*

[38] AN ANASAZI ADAPTATION TO THE DESERT MARGIN: VIRGIN ANASAZI IN SOUTHERN NEVADA

Settled communities are concentrated along the Muddy and Virgin Rivers at the eastern edge of the Mojave Desert. Shards found much further west raise issues regarding the extent and intensity of Anasazi use of non-riverine parts of the desert. Nearby resource availability and the costs of transport make it unlikely that Anasazi food procurement groups exploited locales 30 km and more from habitation sites. Either a biseasonal pattern of habitation or attempts to colonize adjacent areas still point to a restricted Anasazi presence in the desert. Alternatively, the distribution of sherds may reflect exchange with adjacent, more mobile societies.

*Lynott, Mark and Jeffrey Richner (National Park Service)*

[37] THE STATUS OF ARCHAEOLOGICAL SITE PRESERVATION IN THE NATIONAL PARK SYSTEM

Archaeological sites within units of the National Park Service are threatened by visitor use and facility development, vandalism and natural processes. Programs to minimize impacts from erosion are being developed, but implementation is sometimes delayed by conflicts with other programs, logistic problems and limited funding. Several different methods of stabilization have been utilized in an effort to insure in-place preservation of sites, and progress is being made on ARPA enforcement and public education. However, treatment of historic structures, and development of new facilities continue to impact archaeological resources. Although funding for mitigative research is available, more emphasis must be placed on in-place preservation of archaeological resources.

*Mabry, Jonathan (Arizona)*

[47] PREHISTORIC WATER MANAGEMENT IN THE JORDAN RIVER VALLEY

Accumulating archaeological evidence indicates that prehistoric settlement in the Jordan River Valley was largely based upon flood irrigation and storage. Early to mid-Holocene hydrology can be reconstructed from the contexts of sites found buried in alluvial terraces, while the technology of prehistoric water management is exemplified by the ditches, dams, and reservoirs recently found in association with settlements sites dating from the Neolithic to the Early Bronze Age. These new data allow reconstruction of the prehistoric mode of irrigation, and its influence upon early community organization in this region.

*MacDonald, Keith B. (Michael Brandman Associates) and Michael E. Macko (The Keith Companies)*

[68] SOME PALEOECOLOGICAL IMPLICATIONS OF THE RECENT HISTORY OF NEWPORT BAY AND THE ORANGE COUNTY COASTAL PLAIN

This paper addresses sea level fluctuation, changing river channels, the origin and history of Newport bay and Bolsa Chica Lowland, regional climate and vegetation, and marine resource utilization. Each of these topics is discussed in terms of how they influenced the coastal environment to which prehistoric peoples of southern California adapted.

*Mack, Joanne (Pomona)*

[35] SISKIYOU UTILITY WARE: AN HORIZON MARKER OF THE LATE PREHISTORIC PERIOD FOR THE WESTERN CASCADES OF CALIFORNIA AND OREGON

Siskiyou Utility Ware has now been identified at several prehistoric sites located within the upper drainages of three major rivers in northern California and southern Oregon: the Rogue, the Klamath, and the Pit. Detailed analyses of several collections of the ware indicate a great deal of similarity in manufacturing techniques, vessel shape, and function. In addition, all pottery collections dated by radio-carbon determinations fall within an 800 year period ending by A.D. 1700 and are found associated with other ceramic objects, Gunther Barbed projectile points, and house pit villages.

*Macko, Michael E. and Roger D. Mason (The Keith Companies)*

[68] THE IRVINE COAST ARCHAEOLOGICAL PROJECT: MANAGING THE INCORPORATION OF SCIENTIFIC APPLICATIONS IN SOUTHERN CALIFORNIA CRM

The Irvine Coast Archaeological Project (ICAP) is one of the largest privately funded CRM programs currently active in the United States. The ICAP is regional (30 sites), comprehensive in its scope of

data recovery, and resulting in the development of new archaeometric techniques to address numerous questions requiring data on site age, content, function and overall structure. The design of the program, from management to research, is based on data requirements, not arbitrary political issues. This paper presents the overall research design and management structure of this large project, emphasizing the justification for the numerous archaeometric studies and computer applications employed.

*Macko, M. E. (see MacDonald, K. B.) [68]*

*Macko, M. E. (see Hurd, G. S.) [68]*

*Macko, M. E. (see Mason, R. D.) [68]*

*MacLeod, Murdo (Florida)*

[01] INDIAN RIOTS AND REBELLIONS IN COLONIAL CENTRAL AMERICA 1530-1720: CAUSES AND CATEGORIES

There were many episodes of overt Indian resistance in the colonial Audiencia of Guatemala. The first wave followed Indian realization of the full implications of the Spanish conquest. Later, under the fully developed colonial system, overt violent opposition took several forms, ranging from stone throwing, to riots and violence against colonial and local officials, to one full rebellion against the Spanish regime itself. The purpose of this paper is first to describe these events, most of which are little known. I will then attempt to categorize them, and to analyze the reasons for them and what the Indian perpetrators hoped to achieve.

*Maines, C. (see Bonde, S.) [29]*

*Mallory, John (Santa Clara)*

[12] EL DUENDE: EVIDENCE FOR SPECIALIZED PRODUCTION IN THE COPAN VALLEY, HONDURAS

Excavations at El Duende, a small, Late Classic mound group in the foothills of the Copan Valley, Honduras, have revealed obsidian densities as high as 8900 gms/m<sup>3</sup> over much of the site. Evaluation of the obsidian, other artifacts from the site, and the architectural remains indicate that El Duende served as a specialized workshop providing commodities for exchange with the occupants of the Copan Valley. Site location, artifact assemblages, and architectural quality demonstrate the low socioeconomic status of El Duende's occupants. Specialized production at El Duende is interpreted as a means of supplementing marginal agricultural production through commodity exchange.

*Mallouf, Robert J. (Texas Historical Commission)*

[27] REFLECTIONS ON THE ETHICS OF ARCHAEOLOGICAL EXCAVATION

A number of rather complex issues involving ethics in archaeological excavation have been previously addressed by Lipe (1974) and Plog (1984). Both authors have rightly stressed a need for justification of excavation within the framework of conservation archaeology, a basic tenet being the assumption that it is both feasible and desirable to conserve and protect archaeological sites for the future. The relative merits of research needs and conservation ethic approach to excavation are herein weighed against the realities of site loss, and the unfortunate necessity and prospects of "resaving" archaeological sites indefinitely into the future. Other ethical considerations that to some degree transcend the single-mindedness of archaeological research, such as the archaeologist's responsibilities to landowners and the public-at-large, are also addressed.

*Mandel, R. (see Davis, J.) [47]*

*Mangan, Patricia (Massachusetts-Amherst)*

[58] MATERIAL CHANGES IN MONTBLANC

The relationship of human agency to specific historic conditions is viewed with respect to changes in the built environment of a medieval town in Catalonia. In recovering from severe economic and demographic depression at the beginning of the 18th century, Montblanc rebuilt its infrastructure, engaging in a process of proto-industrialization. Associated changing socioeconomic conditions are understood as burgeoning capitalist relations. This paper focuses on the ways in which individuals defined and understood their material world through the reconstruction and renovation of domestic and work space.

*Marchbanks, Michael (Wisconsin-Madison)*

[61] ORGANIC RESIDUE ANALYSIS: IMPLICATIONS FOR THE INTERPRETATION OF FORM AND FUNCTION

Analysis of the organic residues absorbed into the matrix of ceramic vessels or preserved on the surface of lithic artifacts can be utilized to indicate what was originally stored in or processed by the artifact. This paper presents data from the analysis of over 200 ceramic and lithic artifacts, from the

United States, Belize, and the Congo, finding and examining patterns between their form, context, and organic residues. The analysis has potential for identifying feature use and changes in artifact utilization, leading to more detailed interpretation than is usually possible using purely formal attributes.

*Marcus, Joyce (Michigan)*

[09] OAXACA'S FIRST CERAMICS

Pottery of the Espiridion complex in the Valley of Oaxaca (1900–1400 BC), like the coeval Purron pottery of Tehuacan, consists mainly of undecorated hemispherical bowls and simple ollas. Virtually every shape duplicates that of the gourd vessels that were used prior to the advent of pottery.

*Marek, Marianne and Mark B. Sant (Zuni Archaeology Program)*

[08] ARCHITECTURAL VARIABILITY IN PUEBLO II PITSTRUCTURES: AN EXAMPLE FROM THE N2007 PROJECT, APACHE COUNTRY, ARIZONA

Recent excavations on Navajo Newlands have provided information on 24 pitstructures dating from the early to late portions of the Pueblo II period (ca. AD 950 to 1150). Examination of the architectural characteristics suggest that classes of pitstructures can be identified on the basis of the complexity of associated architectural features (e.g., the presence or absence of a southern recess, pilasters, bench, floor vaults, and miscellaneous other features). In addition, variability in pitstructure morphology is identified between the early and late Pueblo II periods.

*Marks, Anthony E. (Southern Methodist)* [Discussant 81]

*Marquardt, William H. (Florida Museum of Natural History)*

[46] INTERDISCIPLINARY RESEARCH: THE CRITICAL EDGE

Advantages and hazards of interdisciplinary research are exemplified, drawing from the history of American archaeology and my own experiences. Interdisciplinary research can be successful in CRM settings provided that managers, archaeologists, and administrators understand and are committed to the total program, including publication and curation. Interdisciplinary research in university settings requires leadership, stable funding, and institutional support, but participation in long-term projects can be disadvantageous to young scholars who must demonstrate productivity in the form of multiple publications. We should better inform our university colleagues, administrators, and the general public about the advantages of interdisciplinary research.

*Marquardt, William H. (Florida Museum of Natural History)* [Discussant 86]

*Martinez, Valentina L. (Southern Methodist)*

[54] "FOLSOM-MIDLAND" SITES OF THE SOUTHERN HIGH PLAINS

Past and recent investigations conducted in the Southern High Plains have revealed the existence of eight Folsom-Midland sites. The majority of these have been found eroding from Holocene dunes associated with Pleistocene playas. As a result, we are faced with serious limitations in our understanding of the temporal and spatial relationship of Folsom-Midland assemblages. However, the distribution of sites and analysis done on the Midland type site collection yield some insights into the age and association of these two types. Notably, this preliminary research does not provide any conclusive evidence distinguishing Folsom and Midland as two separate complexes.

*Marty, Jeanne (Getty Center for the History of Art and the Humanities)*

[66] DOCUMENTATION OF ARCHAEOLOGICAL MATERIAL AT THE GETTY CENTER

The photographic archive of the Getty Center maintains visual collections in support of advanced study in a broad range of cultural areas with particular focus on the western European tradition and special interest in classical archaeology. The supporting database system, which records basic descriptive information for the archaeological objects and monuments, is essential to the management of the large collection of images, and greatly facilitates scholarly access to these materials. As the database grows, and the possibilities for data sharing and exchange increase, we face serious questions about our control of the dissemination and ultimate use of our information.

*Mason, Roger D. and Michael E. Macko (The Keith Companies)*

[68] ARCHAEOOMETRY AND ARCHAEOLOGICAL INTERPRETATION IN THE IRVINE COAST ARCHAEOLOGICAL PROJECT

The contribution to the project of the archaeometric techniques discussed in previous papers in the symposium is assessed. Interpretation of internal site structure, dating, and seasonality of activity areas is discussed employing data resulting from both archaeometric techniques and more traditional archaeological methods. The archaeometric techniques are shown to contribute information essential for accurate interpretation.

*Mason, R. D. (see Macko, M. E.)* [68]

*Masse, W. B. (see Pak, N.)* [84]

*Masson, Vadim Mikhailovich (Leningrad Branch, Institute of Archaeology, USSR)* [41]

[21] SOVIET PALEOLITHIC ARCHAEOLOGY TODAY AND PROSPECTS FOR SOVIET—AMERICAN COLLABORATION

This paper focuses on two topics. First, it examines the status of Soviet archaeological research on the Paleolithic today, delimits research questions being asked, and contextualizes them within the long tradition of Pleistocene archaeology in the USSR. Secondly, noting similarities and differences in the archaeological records of the US and the USSR, it explores various topics of mutual interest to Soviet and American archaeologists, and details the options now available for Soviet-American collaboration.

*Matlock, G. (see York, R.)* [52]

*Matson, R.G. (British Columbia)*

[74] DIETARY CHANGE IN THE UPLAND SOUTHWEST: THE COMING OF AGRICULTURE

From AD 200–1270, subsistence at Cedar Mesa, Utah, was based on rainfall dry-farming of maize, with other domesticates and wild resources serving as supplements. This paper shows that, during the period AD 200–1270, this adaptation was widespread on the Colorado Plateau, even though another form of agriculture, flood-water farming, was being practiced elsewhere contemporaneously and had been practiced earlier at Cedar Mesa. These two agricultural adaptations are also contrasted with late plateau Archaic subsistence patterns. Evidence for an Archaic-Anasazi transition and for a San Pedro migration to explain the development of agriculture in the western Colorado Plateau will be examined.

*Mauldin, Raymond (New Mexico)*

[59] FACTORS CONDITIONING VARIATION IN SITE AREA IN THE AMERICAN SOUTHWEST

Site area, the distance over which artifacts are dispersed, plays a critical role in interpretive schemes which use survey data. Large sites, thought to result from population aggregation, are the focus of interpretation, with smaller sites and facilities being peripheral. Yet, the factors which cause differences in site area are not understood. While population differences influence site area, several factors, including the nature of the environment and the overall adaptation, are also involved. Comparisons from several well surveyed environments in the Southwest demonstrate marked differences in site area. Factors which may account for these differences are considered.

*Maxon, Jim (US Bureau of Reclamation)*

[37] FROM WATER DEVELOPMENT TO ENVIRONMENTAL MANAGEMENT: RECLAMATION'S CHANGING ROLE

The Bureau of Reclamation's historic role as the primary water resource development agency in the American West is changing. Management of all environmental and cultural resources are being more fully integrated into Reclamation's activities. A Program Mission Statement for Cultural Resources provides a mechanism for long range management of cultural resource within Reclamation's jurisdiction. This paper is not so much a review of Archaeological site preservation accomplishments as a survey of challenges to be met as the Program Mission Statement is implemented.

*Maxwell, Timothy D. (Museum of New Mexico)*

[59] AGRICULTURAL SITES IN AN EVOLUTIONARY CONTEXT

The regional distribution and diversity of agricultural features and facilities is commonly used to characterize functional-adaptational systems but such analyses frequently provide only a description of the system in terms of modal patterns. When agricultural systems are observed to have changed, a monocausal explanation is usually offered. Descriptions of how an agricultural system functioned or changed does not help us understand why the system came to assume its configuration. However, by giving increased attention to the variability within an agricultural system, there is opportunity to measure the most effective response through time and isolate the selective processes that led to new patterns. Data from northern New Mexico is viewed in this framework.

*Maxwell, T. D. (see Reed, H. E.)* [65]

*May, David W. (Northern Iowa)*

[53] GEOMORPHOLOGY AND LATE-QUATERNARY STRATIGRAPHY OF PALEOINDIAN SITES IN THE MEDICINE CREEK BASIN

Paleoindian sites occur in two valley fills in the Medicine Creek Basin. A late-Pleistocene fill containing flakes associated with mammoth bones has a bone-collagen radiocarbon age of about

12,000 yr. B.P. The Paleoindian components at the Allen, Lime Creek, and Red Smoke sites are in the basal organic-rich and reduced sediments of a 15 to 20-meter-thick 10,000–5,000 year-old valley fill. New radiocarbon ages of the humin fraction of organic-rich beds in the lower part of this fill have an age of between 10,000 and 7,000 yr B.P.

*Mazer, J. J. (see Stevenson, C. M.) [33]*

*McAllister, Martin (Archaeological Resource Investigations), Evan I. DeBloois (USFS), Cheryl Ann Munson and Richard C. Waldbauer (National Park Service)*

**[13] COMBATTING THE PROBLEM OF LOOTING AND VANDALISM OF ARCHAEOLOGICAL SITES**

The "combating the problem" workshop dealt with four basic issues in archaeological resource protection: site vulnerability to looting and vandalism; federal laws and regulations protecting archaeological resources from depredation; law enforcement efforts; and protection of archaeological resources on private property. Participants working on the first three topics recommend 11 actions that can be taken to reduce looting and vandalism of archaeological resources on public lands. Participants working on the fourth topic produced a detailed series of recommendations to enhance protection of resources on private property. This presentation will discuss these recommendations, and will provide information on activities undertaken since the workshop.

*McAnany, Patricia A. and Valerie McCormack (Boston)*

**[36] DYNAMICS OF HOUSEHOLD GROWTH AND SOCIAL HETEROGENEITY AT SAYIL, YUCATAN**

Longitudinal models of household development are discussed with particular attention to the social composition of household production units. It is posited that architectural elaboration and compound size are symptomatic of a socially heterogeneous unit with a long occupation history. A household developmental growth model is applied to the Terminal Classic Maya settlement data from Sayil, Yucatan. Different sectors of the city are found to yield residential clusters of comparable size and architectural elaboration and may represent "neighborhoods" in different developmental phases.

*McCallum, Mark (USFS)*

**[52] ALASKA: WHERE THE PAST MEETS THE FUTURE**

Interpreting the past in the coastal forests of the Alaska Region presents unique opportunities as well as challenges. The Tongass and Chugach National Forests have implemented educational outreach programs which attempt to share the rich cultural heritage of Alaska both with members of local communities as well as seasonal visitors. Partnerships have been formed with historical societies, native organizations, universities, public schools, and museums to open a "porthole on the past." This paper presents examples of the Alaska Region's cultural resource outreach and partnership program and suggests that big productions are not necessarily best.

*McCartney, A. P. (see Savelle, J. M.) [43]*

*McCartney, Peter H. (Washington)*

**[85] SELECTIVITY AND HUNTER-GATHERER RESOURCE EXPLOITATION**

Investigations of prehistoric hunter-gatherer resource exploitation have been inhibited by methodological problems associated with the actual demonstration and assessment of selectivity in human resource use. In addition, current theoretical models of hunter-gatherer economic behavior yield conflicting predictions as which parameters will exhibit variation and how these will differ from a "random" or "proportional" pattern of exploitation. These problems in method and theory are addressed in an analysis of resource use by early Paleoeskimo populations in the Canadian High Arctic.

*McClenahan, Patricia L. and Douglas E. Gibson (National Park Service)*

**[85] RETHINKING SUBSISTENCE-SETTLEMENT SYSTEMS OF THE NORTHERN MARITIME TRADITION PEOPLE IN THE CAPE KRUSENSTERN REGION, ALASKA**

Recently gathered data from a two-season National Park Service reconnaissance survey of Cape Krusenstern National Monument, Alaska, taken with previous ethnographic and archaeological research point to a broad use of the lands interior to the coast in the region of Cape Krusenstern, and suggest important new dimensions to the subsistence-settlement systems of the Northern Maritime tradition people there. This paper addresses the findings of the project, presents a predictive model of subsistence-settlement systems, and formulates directions for future research within a regional context.

*McCormack, V. (see McAnany, P. A.) [36]*

*McDonald, S. (see Wylie, J.) [52]*

*McEwan, Gordon (Dumbarton Oaks)*

**[77] THE PIKILLACTA ARCHAEOLOGICAL PROJECT: INVESTIGATIONS AT A MAJOR WARI PROVINCIAL CENTER**

Pikillacta is the largest and best preserved of the provincial Wari imperial centers. Research conducted at this site since 1978 has defined a distinctive settlement pattern associated with this site. Within this settlement system the major component is the architectural complex of Pikillacta. This complex is composed of over 700 individual units but analysis has shown that these consist of only a few basic types. Recent excavations have been devoted to discovering functional differences among these types with the objective of shedding light on site function as a whole, and developing a model for the interpretation of the site.

*McFaul, Michael (La Ramie Soils Service)*

**[47] ASSESSING THE MAGNITUDE OF MIDDLE-LATE ARCHAIC MESIC PALEOCLIMATIC EPISODES**

Geoarchaeology and ecology of 3 archaeological sites in eolian sediments allows estimates of the magnitude of Archaic paleoclimatic episodes that resulted in pedogenesis. Procedures involve spatial and temporal assessments of site-specific climates, ecology, pedology and geomorphology. All locales are experiencing a xeric episode, thus I compared climatic/vegetative/pedogenic records and estimated changes in precipitation and temperature required to promote pedogenesis. Mesic Archaic paleoclimatic episodes experienced 5.8 cm increase in mean annual precipitation and 0.6 °C decrease in mean annual temperature.

*McGuire, Randall (SUNY-Binghamton) and John McNiff (Rhode Island)*

**[58] CERROS DE TRINCHERAS AND THE CULTURAL LANDSCAPE OF NORTHERN SONORA, MEXICO**

The most prominent sites in northern Sonora and southern Arizona are the Cerros de Trincheras. These are isolated volcanic hills that are covered with stone terraces and often topped with stone enclosures, house remains, and compounds. Excavations in the Tucson basin suggest that these sites were terraced villages. The Cerros de Trincheras of Sonora are usually larger and more complex than those in Arizona. This paper examines how the creation of these sites would have transformed the cultural landscape of northern Sonora and discusses the possible economic and symbolic role of these sites in the late prehistory of northern Sonora.

*McKee, Brian R. (Colorado-Boulder)*

**[12] ARCHITECTURE AND THE USE OF SPACE AT THE CEREN SITE, EL SALVADOR**

Exceptional preservation of buried households at the Cerén site in El Salvador allowed for detailed studies of architecture and spatial use. Structures were functionally specialized and exhibited construction techniques not previously known in Mesoamerica. Platforms, columns, and some walls were of massive puddled adobe, while others were bajareque (wattle and daub). All structures had cornices, niches, and thatch roofs. The inhabitants of the site utilized roofing thatch, rafters, and tops of walls as well as niches and specific floor areas for the storage of artifacts and food. Walkways were kept clear and trash was disposed of in specific areas.

*McKee, B. R. (see Sheets, P. D.) [02]*

*McKelway, Henry (Tennessee) and Todd A. Koetje (SUNY-Stony Brook)*

**[83] WHICH LAYER IS THIS? SPATIAL ANALYSIS AND EPISODIC PIT-FILLING EXPERIMENTS AT THE "SEWAGE RUN" SITE**

In an effort to understand both the general nature of pit-filling episodes and the contributions that quantitative spatial analysis methods might make towards their study, an experimental series of pit-fill events were carefully recorded. After several months, the pit was excavated, the three dimensional provenience of each object, and the sediment profile recorded. Several methods of spatial analysis were applied to the resulting data, and their results compared to the known nature of the fill episode. A number of unexpected patterns are explicated and natural transformation processes that may have acted to produce them are suggested.

*McKenna, Peter J. (National Park Service-Southwest Cultural Resource Center) and H. Wolcott Toll (Museum of New Mexico)*

**[17] ANASAZI COMMUNITY STRUCTURE IN THE ANIMAS, LA PLATA, SAN JUAN AREA, NEW MEXICO**

Development of Anasazi communities with major structural differentiation appears to take place toward the end of and after major energy investment in Chaco had ceased. Several questions arise: What was the nature of communities during the 10th and 11th century heyday of Chaco Canyon, and what was their relationship to Chaco? Was the post Chaco development of communities a relocation

of the system that seems to have focussed on Chaco, an outgrowth from it, or a differently organized one? Was there continuity in development of communities or was the development characterized by discontinuities in organization and population density?

*McLemore, Denise (USFS)*

#### [52] THE MORMON—CARSON EMIGRANT TRAIL

The Mormon-Carson Emigrant Trail was the primary route for thousands of argonauts headed for California between 1849 and 1852. Originally opened by Mormon pioneers destined for Salt Lake City, the trail provided a crossing of the rugged Sierras and the highest pass ever traveled by covered wagons. The Eldorado National Forest has identified its original alignment and physical traces, provided a historical overview, and compiled 212 primary source journals and diaries—unequalled in comparable trail studies. Members of the Oregon-California Trail Association are providing invaluable assistance in research efforts, and a local ski area will help interpret the trail.

*McManamon, Francis P. (National Park Service-Archaeological Assistance)*

#### [103] FEDERAL ARCHAEOLOGY: THE CURRENT PROGRAM

Federal agencies conduct, fund, or require the largest portion of archaeological work done in the United States. An incomplete accounting of the amount reported expended by Federal agencies on archaeological work exceeds \$75 million per year for recent years. With such a substantial impact on America's archaeological heritage, Federal agencies should focus their efforts on: better resource inventories and curation, better sharing of information, improved efforts to fight looting, and more public education and involvement.

*McNiff, J. (see McGuire, R.) [58]*

*McPherron, Alan (Pittsburgh)*

#### [61] BYPASSING COLOR IR FILM BY CLOSE-RANGE IMAGING AND PROCESSING IN THE FIELD.

Distinguishing and describing depositional events in the field have hitherto depended on qualitative means such as vision and 'feel,' and the Munsell system. The human eye, however, is limited in its abilities to detect fine gradations in color. Experiments are discussed whose aims are to devise a practical field system for scanning horizontal surfaces and vertical profiles during excavation, with immediate computer enhancement of the resulting images to guide the ongoing process of excavation.

*Mena, Francisco (Museo Chileno de Arte precolombino)*

#### [25] RIO IBANEZ PROJECT: FORAGING SYSTEMS ON THE PATAGONIAN FORESTS

Ongoing research on the Rio Ibanez Valley (46oS, XI Region, Chilean Central Patagonia) is revealing a series of occupations on the steppe-mountain forest ecotone. Survey data and present day biogeography is evaluated in terms of its value for information on prehistoric resource space use, and several lines of inquiry (eg, rock paintings, excavated artifacts and faunal remains, radiocarbon datings) are integrated into a preliminary hypothetical model about the prehistoric occupation of the area, thus providing one of the few illustrations of temperate forest foraging systems in South America.

*Mendoza, M. (see Hirst, K. K.) [50]*

*Merlo, E. (see Plunket, P.J) [02]*

*Merrill, William (Smithsonian) and Martha Graham (Zuni Archaeology Program)*

#### [14] TARAHUMARA RESIDENTIAL MOVES: MOBILITY STRATEGIES AMONG SUBSISTENCE AGRICULTURALISTS

Agriculturalists incorporate numerous mobility strategies into their subsistence-settlement systems. The Tarahumara (Raramuri) of northern Mexico make residential moves during the agricultural cycle to tend fields in various communities, unlike other groups of agriculturalists who occupy fieldhouses for shorter periods of time. Many factors influence Tarahumara residential mobility strategies, including social organization and labor networks, and the distribution and availability of agricultural land. The Tarahumara settlement system is discussed in terms of these factors. Archaeological implications of this site use is then explored through ethnoarchaeological observation on how Tarahumara residences are equipped and maintained.

*Messenger, Phyllis Mauch (Minnesota)*

#### [27] INTERNATIONAL COLLECTIONS AND ETHICAL RELATIONSHIPS

Changing national and international laws and codes of ethics affecting cultural heritage resources create a complex web of value judgments and decisions by professionals and avocationals alike. Archaeologists must address, on a personal and professional level, a series of ethical issues concerning stewardship and scholarly use of the past, as well as their relationship to collections, collectors, and

others who also must make choices about how to deal with objects in collections. This paper discusses models of consensus building among interest groups as an alternative to a win-lose hierarchical approach to resolving disputes over cultural property.

*Michaels, G. H. (see Voorhies, B.) [02]*

*Michaelsen, J. (see Larson, D. O.) [80]*

*Michaelsen, J. (see Johnson, J.) [11]*

*Michals, Lauren M. (UC-Santa Barbara)*

#### [69] FAUNAL EXPLOITATION AND CHIEFDOM ORGANIZATION AT MOUNDVILLE, ALABAMA

Recent research on the Mississippian chiefdom centered at Moundville, Alabama, has allowed for detailed studies on the organization and development of chiefdoms. The economic organization of the Moundville chiefdom is investigated by examining intrasite and intersite distribution of animal species and white-tail deer parts before and after Moundville became the paramount center. Evidence for provisioning the elite with specific cuts of deer early in the development of chiefdom is discussed in relation to the economic differences between simple and complex chiefdoms. The implications of these results for the study of complex chiefdom development are explored.

*Mick-O'Hara, Linda S. (Museum of New Mexico)*

#### [59] GARDENS AND THE HUNT: MULTIPLE USE AREAS ON THE ARCHAEOLOGICAL LANDSCAPE

Ethnographic studies of agricultural societies in the Southwest have provided insights into the use of an extensive landscape for their overall subsistence and ceremonial needs. The archaeological expressions of these land-use patterns provide a better understanding of the behavior and organization of the occupants of larger aggregated communities. The data from these sites and their placement on the landscape provide a more productive avenue toward the explanation of subsistence regimes and agricultural investment. Remains recovered from aggregated sites are best explained only if the whole behavioral landscape is studied. Faunal remains recovered from Tijeras pueblo and Rowe pueblo, and information from small sites surrounding these communities are used to illustrate this point.

*Miller Rosen, Arlene (Israel Dept of Antiquities)*

#### [47] NEOLITHIC CEREAL EXPLOITATION IN THE SOUTHERN LEVANT: PERSPECTIVES FROM PHYTOLITH ANALYSIS

Phytoliths were analyzed from Neolithic sites from the Upper Galilee to Southern Sinai. Results show that Pre-Pottery Neolithic B campsites in Southern Sinai have no cereal remains, but the presence of phytoliths from other grass husks suggests that wild grasses were being exploited and that occupation was seasonal in the spring. Sites of the same period in the Galilee do contain cereal husk phytoliths, but the low number of silica skeletons, as opposed to single cell phytoliths, suggests that wetland farming did not begin until the Pottery Neolithic, at which time silica skeletons are abundant.

*Mills, Anthony J. (Royal Ontario Museum) and Elizabeth Graham (York)*

#### [27] ETHICS AND ARCHAEOLOGY ABROAD: PEOPLE OR POLITICS?

Graham and Mills conduct fieldwork in Belize and in Egypt. Both individuals have also been employed by the governments of countries in these regions—Belize and the Sudan—as administrators of departments of antiquities, and they have served as advisors for organizations and projects providing financial assistance to these countries for the management of cultural resources. They will draw on their experience to discuss guidelines for archaeologists working abroad, and to suggest policy changes for granting institutions, development agencies and educational institutions to improve conditions and long-term prospects for the host country, and people who work abroad.

*Mills, B. J. (see Rothschild, N. A.) [56]*

*Milovich, R. (see Simms, S.) [61]*

*Minnis, Paul E. (Oklahoma) and Michael Whalen (Tulsa)*

#### [33] CASAS GRANDES, CHIHUAHUA, IN REGIONAL CONTEXT

Casas Grandes was the primate center of one of the few clear examples of a complex regional system in the Desert Borderlands of North America (Greater Southwest), yet little is known of its regional nature. Results from the 1989 survey around Casas Grandes, Chihuahua, are presented. We suggest that the highly interactive core of the Paquiman polity was restricted to a relatively small area, approximately 25–30 kms, around Casas Grandes itself. The distribution of macaw breeding loci, ballcourts and other ritual architecture, ceramic assemblages, site hierarchies, and settlement patterns are discussed.

*Minzoni-Deroche, Angela*

[81] RELATIONSHIPS BETWEEN THE ZAGROS AND THE TAURUS IN THE MIDDLE PALEOLITHIC

Systematic fieldwork carried out in Turkey since 1983 by a French-Turkish team has contributed to a better knowledge of the Middle Paleolithic there. The new discoveries in Anatolia as well as new analyses of lithic collections from surface collections and excavations carried out almost 30 years ago suggest that two traditions might have been present during the Middle Paleolithic: one similar to the Zagros industries, and the other to the Levantine ones. The understanding of the way these traditions developed and spread in Turkey is fundamental for the comprehension of human migrations in the Near East and Europe.

*Mitchum, Beverly (Pennsylvania Historical and Museum Commission) and Eleanor King (Pennsylvania)*

[47] TOOL PRODUCTION STRATEGIES AT COLHA, BELIZE

The Maya site of Colha, Belize has been identified as a major center for the production of stone tools. During 1986, excavations in two workshops found that different reduction strategies were used to produce one of the major tool types at the site—tranchet adzes. The strategies differ in that one is wasteful of raw material while the other provides a more conservative use of chert. The workshops are located on adjacent mounds and both date to the same period. These strategies reflect different responses to the development of Colha as a specialized center for stone tool production.

*Molleson, T. I. (see Moore, A. M.) [06]*

*Montgomery, Barbara K. (Arizona)*

[56] CERAMIC ANALYSIS AS A TOOL FOR DISCOVERING PROCESSES OF PUEBLO ABANDONMENT

Refinement and application of the "Room Abandonment Measure" provides a powerful tool for recognizing processes of pueblo abandonment. Comparison of vessel frequencies on room floors with sherd densities in the fill of these rooms not only reveals the rate of pueblo abandonment, but also enables the discovery of specific activities associated with abandonment. This discovery component of the Room Abandonment Measure is emphasized in an analysis of several sites in the Grasshopper Region of Arizona.

*Moore, Andrew M.T. (Yale) and Theya I. Molleson (British Museum)*

[06] DEATH ON THE EUPHRATES

Analysis of the abundant human remains from the early agricultural village of Abu Hureyra 2 in Syria (c. 9,700–7,000 BP) provides evidence for the burial practices, social organization, and ideology of the inhabitants. The mode of burial varied according to the age and sex of the individual. Many were buried under house floors after exposure of the corpse, and some had their skulls removed. Comparison with other sites in the Levant and Anatolia suggest that elements of the ideology underlying such practices were current over a wide area of western Asia during the early Neolithic.

*Moore, James L. (Museum of New Mexico)*

[59] LOCAL ECOLOGY AND SOUTHWESTERN WATER CONTROL SYSTEMS

The construction of water control systems is usually considered to be evidence of stress on prehistoric food production systems. However, the types of devices used and their placement are also indicative of local ecological conditions and the specific resources that were under stress. Studies of Southwestern water control systems demonstrate that prehistoric farming was not as ecologically sound as tradition holds. When the development of Anasazi water control devices is viewed diachronically, it can be seen that they understood the process of environmental deterioration and attempted to counter it both before and after it was initiated.

*Moore, Jerry (Social Process Research Institute)*

[71] MORE THAN JUST A MEAL: SOCIAL IMPLICATIONS OF PREHISTORIC DIETARY PATTERNS ON THE NORTH COAST OF PERU

Manchan and Quebrada Santa Cristina are two prehistoric settlements in the Casma Valley, Peru, which were incorporated into the Chimú Empire (AD 900–1470). Diets in the two communities differed markedly, although the two settlements were near each other and were occupied by similar social classes. Dietary differences cannot be explained solely in terms of resource availability, and alternative hypotheses are considered which relate food patterns to residence, occupational diversity, and the roles of the two communities in the Chimú Empire.

*Moore, Katherine M. (Bentley)*

[46] COMPLEMENTARY STRATEGIES IN PALEOECOLOGY: TRANSITION TO AGRICULTURE IN SOUTH AMERICA

Archaeological investigations of agricultural origins in the central Andes have been directed toward the interaction of different aspects of regional systems of climate, plants, animals, and humans. This

approach demands examination of multiple data sets in order to measure the human position in the emerging agricultural ecosystem. Faunal remains indicate the changing relations between humans and animals. Botanical remains indicate intensification upon certain plants as crops and the effect of humans and animals on the environment. Stable isotope analysis provides an independent assessment of the changes seen in the archaeological remains.

*Morales, Thomas M. (New Mexico)*

[80] EVIDENCE FOR CERAMIC PRODUCTION AT TONQUE PUEBLO

Compositional analyses of thousands of Rio Grande glazeware sherds have indicated that Tonque Pueblo was a major producer of glaze painted ceramics in the northern Rio Grande Valley during the fifteenth and sixteenth centuries. In order to identify the organization of ceramic production at Tonque Pueblo, previous excavation reports were examined for evidence of production implements, facilities, and by-products. This report discusses the nature of this evidence.

*Morris, Elizabeth A. (Arizona State Museum) and Richard C. Blakeslee (Arizona)*

[22] CAREY LAKE, 5LR 130, A HIGH-ALTITUDE PALEOINDIAN SITE IN NORTHERN COLORADO

Surface remains from this site, located at an elevation of 11,000 ft (3385m) in the Medicine Bow Mountains of northern Colorado, include basally ground lanceolate, predominantly quartzite projectile points. Some have parallel oblique flaking. It is inferred that biconvex and plano-convex artifacts of relatively large size made of similar materials belong to the same assemblage. It is further hypothesized that the occurrence of occasional specimens of similar material and manufacture on nearby sites are an indication of the use of the surrounding terrain as a Paleoindian resource procurement area during the occupation.

*Mosley-Thompson, E. (see Shimada, I.) [76]*

*Motsinger, Thomas N. (Northern Arizona)*

[24] CRAFT SPECIALIZATION IN THE GALISTEO BASIN, NEW MEXICO

Changes in the degree of craft specialization are examined in the glazeware ceramics exported from the Galisteo Basin to the Salinas area. Rio Grande Glazeware bowl rim sherds recovered from two Salinas pueblos are classified into Rio Grande Glaze types A through E, representing a 250-year time period. The degree of ceramic specialization is assumed to correlate with the degree of standardization, which is measured using both rim form and line width measurements. It is expected that the later glazes will show greater standardization, as the Galisteo Basin became the predominant producer of glazes during the mid-sixteenth century.

*Mozzillo, Elizabeth Oster (Tulane)*

[02] LAS VENTANAS: A NORTHERN MESOAMERICAN FRONTIER SITE IN ZACATECAS, MEXICO

Traditional scholarship has cast Mesoamerica's northern periphery in the role of way-station between "core" areas of the American Southwest and Mesoamerica. This has resulted in sketchy outlines of peripheral regional prehistory, leaving many basic questions unanswered. Cerro de Las Ventanas, in southern Zacatecas, lies in the culturally and environmentally strategic area between the basin-and-lake country of central Mexico and the arid reaches of the Greater Southwest. Data from 1989's Las Ventanas field research suggest the presence of a vigorous northern Mesoamerican frontier tradition; further definition may shed light on Mesoamerican-Southwestern relationships.

*Muceus, Cheryl (Florence Hawley Ellis Museum of Anthropology) and Bob Lawrence (USFS-Carson)*

[15] HERE, THERE, EVERYWHERE: A SITE LOCATION STUDY OF GALLINA SITES REPORTED FROM SURVEYS FOR THE BOOT JACK TIMBER SALE

Surveys of approximately 12,000 acres (4,850 hectares) reported over 300 sites at elevations between 7,500 and 8,500 feet (2,290 and 2,590 meters) on the Santa Fe National Forest in north-central New Mexico. A variety of site types occur in several different environmental zones. The majority are stone masonry habitation structures typical of the Gallina culture. Other site types include pithouses, jacal structures, artifact scatters, water control features, rock art, and shrines. It is difficult to understand why there is so much evidence of an agricultural society in this semiarid high-altitude area.

*Munson, C. A. (see McAllister, M.) [13]*

*Murray, Matthew L. (Harvard)*

[29] 'FIELDS' OF DISCOURSE: THE EVOLUTION OF SOCIAL SPACE DURING THE BRONZE/IRON AGE TRANSITION IN CENTRAL EUROPE

Drawing on perspectives from Critical Geography and contemporary Social Theory, this paper examines the role that the landscape played as structured social space during a period of rapid societal

change in late prehistoric Europe. The considerable variety of prehistoric monuments and other remains that are preserved in archaeological landscapes in southern Germany form part of the mosaic of prehistoric perception and social action in space. Changing patterns in the location and spatial structuring of social action through time are analyzed for several micro-landscapes and are used to illustrate a diachronic and dialectic study of landscape and society.

*Nabhan, Gary P. (Desert Botanical Garden)* [Discussant 28]

*Neck, R. W. (see Peterson, J. A.)* [47]

*Neely, James A., S. Christopher Caran and Barbara M. Winsborough (Texas-Austin)*

[51] PREHISPANIC IRRIGATED AGRICULTURE AT HIERVE EL AGUA, OAXACA, MEXICO

A reinvestigation of Hierve el Agua, located in the upper piedmont zone at the southern end of the Valley of Oaxaca, has reaffirmed the original interpretation by Neely that the terraces and canal system, which largely comprise the site, functioned for irrigation agriculture from the Formative Period well into the Post-Classic Period. This paper will discuss the system's technology, as well as the diatom and hydrochemical analyses undertaken, to provide evidence that the alternative hypothesis presented by Hewitt, Winter, and Peterson (1987), proposing that the terraces and canals functioned for the production of comestible salts, is not viable.

*Nelson, Margaret C. (SUNY-Buffalo)*

[59] CHANGING LAND USE PATTERNS IN THE EASTERN MIMBRES REGION, SOUTHWESTERN NEW MEXICO

The changing role of the eastern slope of the Black Range in regional land use patterning is examined for the prehistoric agricultural occupation from AD 900 to 1300. Changes in regularity and continuity of land use are assessed using characteristics of small site architecture and artifact assemblages across a diversity of environmental and topographic features. These data together indicate that the eastern slope of the Black Range served as an occasional hunting, gathering, and cultivating area into the Classic Mimbres period (AD 1000–1150), but that land use by the Mimbres people shifted toward more permanent occupation at spring sites after AD 1150.

*Nelson, Reid (Navajo Nation Archaeology Department)*

[68] RESOURCE AVOIDANCE AND 106: MUST THEY GO HAND IN HAND?

Cultural resource management policies concerning linear surveys conducted in the New Lands and elsewhere have been dominated by the sponsors' invariant policy of completely avoiding potentially significant cultural resources. This policy often proves burdensome to the sponsor given the density of resources and the complexity of depositional events in the New Lands. Research objectives have also been hampered by such a one dimensional treatment of cultural resources. Dealing with these resources in greater depth would more adequately fulfill research objectives and provide a better informed base from which to evaluate and manage resources encountered in the future.

*Nelson, Sarah (Denver)*

[19] ECHOES OF ETHNICITY IN THE KOREAN PENINSULA AND MANCHURIA 6000–2000 B.C.

Although Korean reconstructions of their culture history usually assert that Koreanness, or Korean ethnicity, begins with the Ye-Maek/Tungus peoples in the "Bronze Age," the earlier inhabitants ("Paleosiaitics") of the Korean peninsula are seen as deriving from the same region. The mechanism described is migration, not mere "influences" from Manchuria. This paper examines the archaeological evidence in Lianong and Jilin provinces in the northeast of China, and considers 1) whether the evidence suggests ethnic continuity, 2) whether it is reasonable to consider the inhabitants as either "Chinese" or "Korean," and 3) to what extent there is continuity in styles which might indicate ethnic identity.

*Neumann, L. (see Cheek, A. L.)* [13]

*Neupert, Mark A. and William A. Longacre (Arizona)*

[22] DOES THE CRAFTSPERSON KNOW BEST?: CERAMIC USE-LIFE STUDIES AND INFORMANT ACCURACY

Ceramic use-life studies have the potential to increase our understanding of ceramic assemblage formation, duration of site occupancy, and functional variability. Previous investigations of ceramic use-life and its applications have been hindered through the forced use of informant estimates of vessel ages as error-free data. Using unique information obtained by the Kalina Ethnoarchaeological Project, this paper analyzes informant error and its effect on ceramic use-life estimates. In addition, variables which increase informant error are identified, to create a profile of people likely to be more accurate informants to be used by future investigators.

*Newman, Jay R. (US Army Corps of Engineers-Ft. Worth)*

[33] NOTES ON THE X-RAY FLUORESCENCE CHARACTERIZATION OF THE RHYODOCITE SOURCES OF THE TAOS PLATEAU, NEW MEXICO

Lithic sourcing studies have become increasingly common over the past few years covering a variety of raw materials from sedimentary rocks such as chert and jasper to volcanic rocks such as obsidian. Analytical scope has varied, methods have varied due to the particular material being sourced and the facilities available, from macroscopic visual appearance to X-ray fluorescence (XRF) and neutron activation analysis. Less common are sourcing studies regarding minerals such as galena and turquoise and other predominantly volcanic rock materials such as tephra. This study falls into this latter category, detailing the XRF characterization of a series of rhyodacite (or alkalic dacite) sources of the Taos Plateau and the sourcing of a sample of rhyodacite artifacts from three proximal Anasazi sites of the Taos area of the Northern Rio Grande region, New Mexico. Artifact samples were selected from the major town of Pot Creek Pueblo, Sagebrush Pueblo, and the Cerrita site all located within a kilometer of one another along the Rio Grande del Rancho Valley 16km southwest of Taos.

*Ni Ghathbhain, Sinead (UCLA)*

[29] CHURCH AND SOCIETY IN EARLY HISTORIC IRELAND

"Celtic" monasticism developed in Ireland, the first country outside the Roman empire to be Christianized, as an adaptation of the Roman church to Celtic socio-political organization. In this paper, data, from a regional survey of ecclesiastical settlement in Ireland, is used to examine the development of ecclesiastical organization over a period spanning 1,000 years and to examine the changing relationships of ecclesiastical settlement to secular settlement and land-holding patterns. Locational models for the development of ecclesiastical organization are developed.

*Nials, F. L. (see Durand, S. R.)* [33]

*Nials, F. L. (see Livingston, S. D.)* [38]

*Nichols, Deborah L. (Dartmouth)*

[30] MAGEY FIBER PRODUCTION IN THE AZTEC CITY-STATE OF OTUMBA, MEXICO

Textiles played a multifaceted role in the Aztec economy. Recent archaeological investigations at the Aztec city-state of Otumba confirm that maguey fiber production was an important part of the local economy, and that it was organized differently than cotton fiber production. Small spindle whorls used to make cotton thread are found at low frequencies in all parts of the Otumba site. The large maguey spindle whorls, however, occur almost exclusively in workshops defined by dense concentrations of whorls that are associated with spindle whorl molds with worn obsidian blades and obsidian and basalt scrapers apparently used to process maguey pencas.

*Nickens, Paul R. (Corps of Engineers)*

[37] RESEARCH ORIENTATIONS FOR PRESERVING ARCHAEOLOGICAL PROPERTIES AT CORPS OF ENGINEERS' WATER RESOURCES PROJECTS

Development of water resources projects associated with waterway, reservoir, and coastal settings often leads to numerous and varied preservation conflicts during both construction and operation/maintenance phases. Effective and long lasting in place preservation may require identification of innovative protection technologies or simply transfer of extant technology from another field. Research is underway at the U.S. Army Engineer Waterways Experiment Station to identify appropriate technologies for resource preservation and to develop management guidelines and strategies. This paper reviews the nature of water resources impacts on the archaeological record and provides an overview of the site preservation research results.

*Nodine, Bruce K. (Brown)*

[62] ACERAMIC POPULATIONS IN THE LESSER ANTILLES: EVIDENCE FROM ANTIGUA, WEST INDIES

The aceramic sites in the Lesser Antilles represent this area's longest dated occupation (e.g., Antigua: about 5000 BP to about 2000 BP), yet these sites are some of the least studied. The Antiguan sites provide evidence for the potential identification of different populations moving among the islands. While most sites represent short-term occupation, others indicate recurrent use with date ranges of up to 2000 years. Some of the lithic assemblages have obvious evidence of reuse. These sites' subsistence remains, locations, and assemblages are discussed in the context of aceramic population movement as well as potential interaction with later ceramic bearing population.

*Nordby, Larry (National Park Service)*

[37] SITE PRESERVATION STRATEGIES AT CANYON DE CHELLY

Preservation and Protection Plans comprise an emerging tool that identifies and analyzes preservation problems for archaeological sites in National Parks. Their goal is to use existent archaeological

survey data and augment it when necessary with new field studies, in order to develop law enforcement, interpretive, and fabric stabilization strategies. This paper discusses the project design for preparing such a plan at Canyon de Chelly. Components of project design are multilevel research data acquisition based on architectural integrity, potential environmental degradation and unauthorized visitor impact.

*Nowak, C. (see Wigand, P. E.) [38]*

*Nurkin, Gary (US Environmental Protection Agency)*

**[04] THE ABANDONED SHIPWRECK ACT: LEGALIZING CONFLICTING VALUES OR PROTECTING CULTURAL RESOURCES**

As a result of several court decisions in the 1970's, archaeologists began to lobby for effective legislation to protect historic and archaeological shipwrecks situated in state waters. In 1987, Congress finally promulgated the Abandoned Shipwreck Act which was enacted into law in early 1988. The National Park Service has recently issued its proposed guidelines for the protection of these resources. Within this context, it is appropriate to assess the legal ramifications this Act will have on the activities of salvagers. This paper will focus on the ASA's effectiveness with respect to shipwrecks situated in Massachusetts, New York and South Carolina.

*O'Brien, Patricia J. (Kansas State)*

**[03] U.S. GOVERNMENT ARCHAEOLOGY ON THE GREAT PLAINS**

Federal support for Plains archaeology in the 1930's involved WPA projects and Smithsonian research. Following WW II with flood control plans for the Missouri River the Smithsonian River Basin Survey focused on post-A.D. 1000 Villager Farmers and important Historic sites on the Middle Missouri. The Moss-Bennett bill and E.O. 11593 of the late 1960s, with the potential to fund archaeology a 100-fold, created monies viewed as a new source for funded research, and private sector archaeology. The mid-70s and 80s saw the development of a federal archaeological bureaucracy, an emphasis on inventory and management, and a greater focus on agency and public needs.

*O'Connell, James F. (Utah) [Discussant 38]*

*O'Connell, James F. (Utah) [Discussant 42]*

*O'Mack, Scott (Chicago)*

**[71] MONTEZUMA'S DINNER RECONSIDERED**

Lewis Henry Morgan's essay, "Montezuma's Dinner," an attack on Bancroft's credulous use of sixteenth-century Spanish sources to reconstruct a lavish court life in Aztec society, was itself an egregious effort to bend historical data to the contours of evolutionary theory. Students of Aztec society no longer doubt the wealth of the Aztec empire, but the significance of that wealth continues to be glossed, much as by Morgan, in economic and evolutionary terms. A fresh look at Montezuma's dinner and the essay it inspired prompts a questioning of the prevailing materialist orientation of recent work in Aztec ethnohistory.

*Ortting, Albert C. (Heritage Research Associates, Inc.)*

**[07] VILLAGES, WETLANDS ADAPTATIONS, AND SEDENTISM IN THE GREAT BASIN**

Recent research has debated whether mobile hunter-gatherer groups would choose to become sedentary, to stay near abundant resources, or whether sedentism was a settlement option forced upon groups by external stresses. Settlement studies in the Lake Abert-Chewaucan Marsh Basin of south-central Oregon suggest that stress-based explanatory theories are inadequate to account for the presence of semi-sedentary pithouse villages in wetland settings. This study argues that reduced mobility in response to resource abundance is fully congruent with recent theoretical constructs and that explanations for sedentism are probably multi-causal in nature.

*Olsen, Sandra (Virginia Museum of Natural History)*

**[47] SOLIFLUTION AS A MAJOR TAPHONOMIC PROCESS AT SOUTRE, FRANCE**

Solifluction played a significant role in the transformation of the Upper Paleolithic locality of Solutre, France, into the archaeological deposits seen today. Located on a talus slope, the Late Pleistocene horse kill site suffered from downslope migration of its deposits and heavy sediment loading. The resulting effects include: disarticulation of associated elements, mixing of skeletal remains from different individuals and of deposits of different ages, breakage and surface abrasion of bones, and differential preservation of elements of thin versus thick cortical tissue. Analysis incorporated SEM of abraded bone surfaces and X-rays of cortical bone thickness variation in Przewalski horse skeletons.

*Olsen, S. (see Hantman, J.) [69]*

*Olszewski, Deborah I. (Georgia)*

**[81] NEW LIGHT ON THE ZAGROS UPPER PALEOLITHIC: THE BARADOSTIAN FROM WARWASI ROCKSHELTER, IRAN**

The Baradostian, defined over 30 years ago, has subsequently received little attention or further evaluation. Recent analysis of Baradostian chipped stone artifacts ( $n > 14,000$ ) from Warwas offers new insights. The original Solecki definition is amplified and refined. Microliths are an important component, as well as burins. However, examination of the polyhedral (carinated) burins suggests that these are single platform cores made on flakes/blades. The addition of these "burin-cores" to the numerous cores, and the microlith frequency, suggest an intensive use of raw material. This may be a Baradostian expression equivalent to the intensive resharpening of tools in the Mousterian.

*Orcutt, Janet (National Park Service)*

**[59] FIELD HOUSES, COMMUNITIES, AND LAND USE ON THE PAJARITO PLATEAU**

The relationship between habitation sites and nonhabitation sites through time on the Pajarito Plateau are complex and changing. This paper examines agricultural land use on the Pajarito Plateau by testing predictions for site locations based on climate, population density, and population aggregation. It is proposed that when population density and aggregation are low habitation and field house locations will respond to environmental factors such as precipitation and water tables. As population density and aggregation increase, habitation locations should respond less to environmental variability because of social constraints. Field house locations, however, should continue to respond to climatic and environmental factors.

*Orr, Marilyn R. (Ohio Department of Transportation), Myra Giesen, Paul W. Sciulli and Kollen R. Butterworth (Ohio State)*

**[61] STATURE VARIATION AMONG AMERICAN CIVIL WAR SOLDIERS**

This study was undertaken to collect data on stature variation in American-born and foreign-born males from the first half of the 19th century and to determine what social/environmental factors were responsible for the differences. Males ( $n = 4800$ ), ages 16 through 45 were surveyed. Data were collected from the Ohio Historical Society archives of the Adjutant General's muster roll from the American Civil War from Tod Barracks located in Columbus, Ohio. Data included age, birthplace, stature and occupation. American-born males were significantly taller than foreign-born males. As in the Colonial period, the major factor responsible for stature differences seems to be nutritional.

*Owens, M. (see Julien, D. G.) [77]*

*Oyuela, Augusto and James Zeidler (Pittsburgh)*

**[09] THE EARLY FORMATIVE CULTURES OF NORTHWESTERN SOUTH AMERICA: CERAMIC CHANGE AND ASSEMBLAGE DIVERSITY COMPARED**

This paper compares the Formative Period complexes of northern Colombia and western Ecuador. New settlement data from the former are presented which force a significant rethinking of Formative economy and society in this area, suggesting parallels with recent reassessments of the Valdivia complex. It is argued that the elaborate ceramic traditions of these two complexes provide useful indices of social change and evolving technological complexity.

*Pai, Hyung Il (Harvard)*

**[19] CULTURAL INTERACTION BETWEEN THE LELANG COMMANDERS AND IRON AGE KOREANS**

The extent of interaction between the local Iron Age Koreans and the Lelang commandery inhabitants will be examined in the framework of acculturation theory. The database used for analysis is archaeological rather than literary, as heretofore employed. Mutual acculturation can be posited, with ramifications for determining the ethnic identity of individuals participating in the commandery system.

*Pak, Nathaniel, Christopher L. Turner, L.J. Moana Lee and W. Bruce Masse (SHPO-Hawaii)*

**[84] GARDENS OF STONE: PREHISTORIC AGRICULTURAL INTENSIFICATION IN NANAKULI VALLEY, LEEWARD OAHU ISLAND, HAWAII**

The role of dryland agriculture in prehistoric Hawaiian demography and complex societal development has been explored by various authors during the past two decades, but most of this discussion has been based on archaeological data from a small number of projects, largely conducted in unscientific and piecemeal fashion. Our ongoing study of Nanakuli Valley has provided us with the opportunity to examine intensively a large and well-preserved late prehistoric settlement system, including numerous hectares of complex dryland agricultural features. This paper defines aspects of the structures and evolution of prehistoric subsistence and settlement in Nanakuli Valley.

*Panet Klug, L. (see Scott Cummings, L.)* [68]

*Parker, S. (see Limp, W. F.)* [66]

*Parry, William J. (CUNY-Hunter)*

[50] SPECIALIZED PRODUCTION AND CONSUMPTION OF OBSIDIAN TOOLS IN AN AZTEC CITY-STATE

Late Aztec and early Colonial obsidian tools and debris from Otumba, an Aztec city-state in the Basin of Mexico, are described. Although obsidian is locally available, the majority of tools were made from nonlocal (Pachuca) obsidian. A wide range of obsidian implements was produced at Otumba, apparently by specialists, including prismatic blades, scrapers, bifacial knives, dartpoints, and arrowheads. Many of the blades were consumed locally by other craft specialists, and blade cores were transformed into ear spools and labrets in specialized lapidary workshops.

*Parry, W. J. (see Smiley, F. E.)* [05]

*Patterson, Nerys (Harvard)*

[16] NOT PRIMORDIAL: CLANS, POPULATION DISTRIBUTION, AND POLITICAL ORGANIZATION IN EARLY MEDIVAL IRELAND

The paper describes the general social features of clan organization in the early medieval Ireland and examines the specific social forces attendant on the historical emergence and development of clan-based polities. Particular attention is given to functioning of a competitive warrior elite in the context of a dispersed low-density population.

*Paynter, Robert (Massachusetts-Amherst)*

[58] THE TRANSFORMATIONS OF THE W.E.B. DUBOIS BOYHOOD HOMESITE: A CONSIDERATION OF RACE, CLASS, GENDER AND SPACE

Cultural landscapes result from the productive efforts of human agents. Why and how a site is chosen, built, transformed and abandoned depends upon the possibilities and constraints open to possible specific places in the social order at specific times. The African Americans who built, transformed, abandoned and are restoring the WEB DuBois Boyhood Homesite in Great Barrington, Massachusetts operated within a shifting web of class, gender and race relations. The transformations of this property are the legacy of ongoing struggles over the content and position of the class, gender and race lines in interior New England, a legacy that will be partially traced in this paper.

*Peacock, Evan (Sheffield)*

[40] A METHOD OF DISTINGUISHING BETWEEN ARTIFACTS AND NATURALLY-FLAKED STONE

Distinguishing artifacts from naturally-flaked stone has been a recognized problem in archaeology since the 19th century. A group of possible Palaeolithic artifacts from eastern England is examined using general and local characteristics. The general characteristics are derived by comparing known archaeological samples to natural samples; local characteristics by comparing the possible artifacts with a natural sample from the same site. The presence of features deemed significant by these comparisons contributes to a composite score for each object examined; artifacts score higher than natural flakes. The results indicate that some of the flakes in question are artifacts.

*Pearsall, Deborah M. (Missouri-Columbia)*

[46] INTERDISCIPLINARY RESEARCH IN ARCHAEOLOGY: THE PERSPECTIVE FROM PALEOETHNOBOTANY

This paper looks at the relationship between archaeology and paleoethnobotany today. Two perspectives on this relationship are developed. The first views the relationship from the traditional interdisciplinary perspective: how botanical studies enhance archaeological investigations of diet, subsistence, and other questions of human-plant interactions. The other focuses on paleoethnobotany as archaeology: how archaeological data which are botanical enhance our understanding of a broad range of cultural issues. General discussion of these issues is followed by two examples: 1) how paleoethnobotany has changed our understanding of the antiquity and importance of maize cultivation, and 2) how botanical data provide insight into changing social complexity.

*Peebles, Christopher S. (Glenn A Black Laboratory)*

[66] DATABASE MANAGEMENT SYSTEMS: THE EMPHASIS SHOULD BE ON THE MIDDLE TERM

With the advent of inexpensive database management systems for personal computers and advanced workstations, their application has proliferated throughout archaeological research. There is even talk of paper-less excavation records and museum catalogs. The result has been a tidal wave of undocumented databases that entropy far faster than the old "paper" records. The emphasis in

database construction and use must be on its management aspects: schema and dictionary documentation, semantic modeling and sound design, a demand for the data to be independent of particular machines and operating systems, and a realistic view of just what such systems can and cannot accomplish. "Just put 'everything' in" is neither a realistic goal nor an appropriate management tool.

*Pendergast, D. M. (see Graham, E.)* [01]

*Pendleton, L. S. (see Thomas, D. H.)* [42]

*Perttula, Timothy K. (Advisory Council on Historic Preservation)*

[78] PROBLEMS IN RESEARCH DESIGN: THE ADVISORY COUNCIL'S WESTERN OFFICE OF PROJECT REVIEW PERSPECTIVE

Each year our office reviews and comments on several hundred archaeological research designs/data recovery plans as part of the Section 106 process. Often these exhibit problems and weaknesses in structure, content, and logic; lack explanatory frameworks for structuring research endeavors and promoting the development of relevant research domains; and fail to sufficiently justify and evaluate whether proposed hypotheses and specific testable implications contribute to an improved understanding of the archaeological record. These problems relate to a lack of concern for theory building, and an inadequate understanding of the Section 106 process.

*Perttula, Timothy K. (Advisory Council on Historic Preservation)* [Discussant 75]

*Peters, Gordon, Christy Hohman-Caine, Mark Bruhy and Mike Beckes (USFS)*

[52] PASSPORTS IN TIME: PUBLIC ARCHAEOLOGY IN THE UPPER GREAT LAKES

PASSPORTS IN TIME is an innovative program developed to provide and recognize volunteerism in Forest Service Heritage Management. In 1989, 115 volunteers from all over the U.S. assisted with excavations at a dozen prehistoric sites in Minnesota, Wisconsin, and Michigan. Their carefully supervised efforts provided critical management information, added to our understanding of local culture history, and helped develop and nurture a "conservation ethic" toward fragile cultural resources. This paper will discuss our experiences with large-scale volunteerism and the creation of a partnership in historic preservation with the public.

*Peterson, Jane (Arizona State), Kathy Bolen and Kristopher R. Caramelas (South Carolina)*

[47] LITHIC RAW MATERIAL PATTERNS IN SOUTHEASTERN IRELAND

Six years of survey and excavation within a 460 km<sup>2</sup> study area reveal evidence of two very different sources of lithic raw materials being utilized. Lithic assemblages from Mesolithic, Neolithic, and Bronze Age periods are made up, almost exclusively, of locally quarried rhyolite and small water-rolled flint pebbles from the beaches. Analysis of the availability distribution and artifact types manufactured from each source provides insight into the differential use and movement of each through time. Implications for behavioral continuity in procurement and mobility systems are discussed.

*Peterson, John Allen (Archaeological Research, Inc.), S. Christopher Caran (Texas-Austin), Raymond W. Neck (Texas Parks and Wildlife) and Barbara M. Winsborough (Texas-Austin)*

[47] MARSHES, PONDS, AND PALEOSOLS: HOLOCENE BIOSTRATIGRAPHY AT PALO DURO IN THE SOUTHERN PLAINS

Organic rich palustrine and lacustrine sediments as well as paleosols found during cultural resource investigations for the Palo Duro Reservoir have proven to be rich sources of several diagnostic fossil biota, including pollen, molluscan fauna, diatoms, and plant macrofossils. A series of radiocarbon dates along with diagnostic cultural material indicate a nearly complete sequence of sediments throughout the Holocene. This fossil biological record has contributed critical information for paleoenvironmental reconstruction and analysis of human/environment articulation through several settlement periods on the Southern Plains.

*Peterson, Mark L. (UC-Irvine Program in Social Ecology), Jonathon E. Ericson (UC-Irvine) and Gary S. Hurd (The Keith Companies)*

[68] GEOPHYSICAL SURVEY OF PREHISTORIC SITES ON THE IRVINE COAST

Systematic survey using proton magnetometers and an electromagnetic induction terrain conductivity meter was conducted to locate cultural features and determine geomorphic site characteristics prior to excavation. Extensive excavation conducted at five prehistoric sites demonstrated the geomagnetic survey to be highly successful in locating prehistoric hearths and associated cultural deposition. Geophysical survey results are compared with systematic sample recovery to provide estimates of the efficacy and cost-effectiveness of the two instruments under a variety of soil and geomorphological

conditions. Contour maps and profiles of geomagnetic data are compared with thermal remnant magnetism results to provide characteristic signatures.

*Phagan, C. J. (see Huffman, J.) [33]*

*Phillips, Ben and William R. Killam (J.F. Sato and Associates, Inc.)*

**[78] BALANCING CRM AND RESEARCH: APPROACHES AND THE ROLE OF THE REVIEWER**

Research is the tool most frequently used to mitigate impacts to cultural resources. The keys to designing research that constitutes effective mitigation are clarity of purpose and a balance among research needs, management needs, and project constraints. The statement of Work soliciting research must make these key factors explicit. Research designs are subjected to numerous reviews in the Section 106 consultation process. Although each reviewing organization has a different mission and priorities, all reviewers should evaluate the research design for its ability to contribute usable, needed information and to do it within the framework of the sponsor's purpose and constraints.

*Phillips, David A. (Museum of New Mexico)*

**[02] A RE-EVALUATION OF THE ROBLES PHASE OF THE CASAS GRANDES CULTURE, NORTHWEST CHIHUAHUA**

In Di Peso's landmark study of Casas Grandes culture, the Robles phase represents a late survival of the culture after the abandonment or destruction of its largest site, Paquime. A re-evaluation of the data suggests that supposed Robles phase site actually date to the Medio period, and that when Paquime fell the Casas Grandes area was entirely abandoned.

*Phillips, J. L. (see Gladfelter, B. G.) [55]*

*Picha, P. R. (see Ahler, S.) [30]*

*Pickin, Frances (SUNY-Buffalo)*

**[22] THE ARCHAEOLOGY OF CAMP FOLLOWERS**

Recent research at Old Fort Niagara, an 18th century fortification in Niagara County, New York, provides insights into the role of women camp followers during the last half of the 18th century. A comparison of archival and archaeological data demonstrates the difficulties of inferring gender differences from material culture but also suggests several hypotheses relevant to the study of cultural variations between core and peripheral areas.

*Pilles, Jr., Peter J. (Coconino National Forest)*

**[73] SITES, SITES, AND MORE SITES: THOUGHTS ON SINAGUA SETTLEMENT AND SOCIAL ORGANIZATION, 1916-1990**

The area around Flagstaff, Arizona has received fairly intense archaeological survey since 1916. This paper describes concepts of local prehistory, settlement, and social organization and how they relate to the ever-increasing data base available to researchers over the years. Survey data has accumulated at a much greater rate than excavation data and has been most frequently used to formulate interpretations. Although quantity of data is important for demonstrating, strengthening, or rejecting these concepts, the characteristics and relationships of the researchers involved and persistence of archaeological work is even more important. Traditional interpretations of settlement and social organization, changing ideas in more recent times, and future directions will be discussed.

*Pilles, Jr., Peter J. (Coconino National Forest)*

**[37] ALPHA TO OMEGA: PAST, PRESENT, AND FUTURE DIRECTIONS FOR SITE PROTECTION AND PRESERVATION IN THE U.S. FOREST SERVICE**

The rise of cultural resource management in the U.S. Forest Service over the past 15 years has been remarkable, particularly for an agency as traditional and conservative as the Forest Service. From begrudging acceptance of archaeological surveys of timber sales to meet requirements of environmental and preservation law, in many parts of the country the USFS has progressed to the vanguard of many aspects of cultural resource management. This paper will discuss the evolution of the Forest Service program and will attempt to identify those forces that stimulated or hindered this transition. Changes in protection and preservation policies and procedures, as well as likely directions and needs for the future, will be addressed.

*Pilles, Peter (USFS-Arizona)*

**[26] ARIZONA SITE STEWARDS: PARTNERS IN PROTECTION**

The historic "Saving the Past for the Future" Workshop, identified the need to develop a sense of awareness and responsibility in the American public about archaeological sites. In Arizona, this was recognized several years ago; the Arizona Site Stewards Program was one response. Modeled after programs in Texas and British Columbia, it is now the largest volunteer effort to protect sites in the

world. This paper discusses the history, evolution, and success of this program, how it has promoted greater public awareness for archaeological site protection, and what we have learned about developing and maintaining volunteer programs.

*Pinto, Cynthia (Nevada-Reno)*

**[61] PRELIMINARY RESEARCH OF THE MATERIAL CULTURE OF THE WINNEMUCCA LAKE CAVE SITES IN PERSHING COUNTY, NEVADA**

The excavations of the Winnemucca Lake Cave sites in Pershing County, Nevada by Phillip Orr in the 1950's produced a plethora of cultural material which suggests a long period of areal occupation of the Winnemucca Lake Basin.

This poster session is designed to present the lithic, perishable and textile industry of the sites for the purpose of examining subsistence adaptations over several thousand years by successive populations. This data represents on-going research focused on establishing the chronology of the prehistoric utilization of these caves and rock shelters as cache and burial sites.

*Pippin, Lonnie C. (Quaternary Sciences Center-Desert Research Institute)*

**[38] DISCERNING CHANGING PATTERNS OF ADAPTATION OF HUNTERS AND GATHERERS IN THE SOUTHERN GREAT BASIN**

Hunters and gatherers orient their settlement and subsistence activities around certain critical resources. Because the nature, distribution and abundance of resources available to hunters and gatherers varied through time and space, we would expect that settlement and subsistence activities also changes through time and space. Nevertheless, because the resources exploited may occur through widely dispersed areas, changes in these settlement and subsistence patterns may only be discernable on a large regional basis. This paper will examine the evidence for changing patterns of subsistence and settlement in southern Nevada where North America's hottest and most arid desert, the Mojave Desert, joins the colder Great Basin Desert.

*Plunket, Patricia, Gabriela Uruñuela (Universidad de las Americas-Puebla) and Eduardo Merlo (Centro Regional de Puebla, Instituto Nacional de Antropología e Historia)*

**[02] POSTCLASSIC STONE CARVING FROM THE VALLEY OF ATLIXCO, PUEBLA, MEXICO**

The stone carving tradition of the Valley of Atlixco in the state of Puebla, Mexico, was first reported by Guillermo Dupaix at the beginning of the nineteenth century. Joint research by the Universidad de las Americas and the Centro Regional de Puebla (INAH) has been aimed at locating and describing all of the carved monuments in this area of Mexico. This paper will present and discuss the context and iconography of the carved stones located up to the moment, focusing primarily on examples from Huaquechula and the Cerro Xochitecatl.

*Pohl, John (UCLA) and Bruce E. Byland (CUNY-Lehman and the Graduate Center)*

**[02] BUREAUCRACY IN POSTCLASSIC MIXTEC KINGDOMS: ETHNOHISTORIC AND ARCHAEOLOGICAL EVIDENCE FROM TILANTONGO**

The bureaucratic organization of postclassic Mixtec kingdoms has long been considered to be out of the reach of both ethnohistoric and archaeological investigation. Recent research at the site of Tilantongo, Oaxaca has provided a new view of the religious basis of bureaucracy in Mixtec communities between A.D. 940 and the early 1500's. We here identify two well defined groups of priestly administrators who both support the ruler and provide a strong check on his/her authority. The separate roles of these two groups of priest can now be seen on the ground and related to published ethnohistoric evidence.

*Pollard, Helen Perlstein (Michigan State)*

**[61] THE POLITICAL AND ECONOMIC IMPLICATIONS OF OBSIDIAN TRADE WITHIN THE TARASCAN STATE**

With the emergence of the Tarascan state in the fourteenth century, a new economic core region was formed in Mesoamerica. As more than 90% of the lithic tools used within this state were of obsidian, it constituted a basic, or strategic, resource. Analysis of the procurement, distribution and utilization of obsidian can therefore provide a significant means of understanding the way this recently formed economic/political core interacted with zones to the east (central Mexico) and west (Nayarit/Jalisco). This paper will report on the implications of obsidian trace element analysis of more than 400 artifacts from the Tarascan capital, Tzintzuntzan, and more than 50 artifacts from fortified sites on the Tarascan/Aztec border.

*Pope, Gregory A. (Arizona State)*

**[33] QUARTZ HYDRATION OF GLACIAL TILLS, EASTERN CALIFORNIA, AS A DATING TOOL**

Encouraged by the results of Ericson and others (1986) on quartz artifacts, a study is in progress to test the suitability of measuring water diffusion into quartz as a geochronometric tool for Quaternary

landforms. Soil samples were taken from previously dated till deposits along the eastern Sierra Nevada of California and in the White Mountains of California and Nevada. Quartz grains were sorted, and water diffusion rinds were measured using infrared spectroscopy, PIXE, and high resolution electron microscopy.

*Powell, J. F. (see Steele, D. G.) [28]*

*Powell, Shirley (Northern Arizona) [Discussant 14]*

*Powers, R. (see Goebel, T.) [54]*

*Pozorski, S. (see Pozorski, T.) [25]*

*Pozorski, Thomas and Shelia Pozorski (Texas-Pan American)*

**[25] EXCAVATIONS AT BAHIA SECA, CASMA VALLEY, PERU: RESULTS OF THE 1989 FIELD SEASON**

Excavations at Bahia Seca near the Casma Valley on the north Peruvian coast revealed that the site was occupied from the end of the Cotton Preceramic (about 1800 B.C.) through most of the Initial Period (1800–900 B.C.). Substantial U-shaped mound and its associated artifacts indicate that Bahia Seca served as an administrative outpost of the complex inland site of Pampa de las Llamas-Moxeke. Discovery of a circular structure with a ventilated hearth points to strong connections with the Kotosh Religious Tradition of the north and central highlands of Peru.

*Praslov, Nikolai Dmitrievich (Leningrad Branch, Institute of Archaeology, USSR) [41]*

*Praslov, Nikolai Dmitrievich (Leningrad Branch, Institute of Archaeology, USSR)*

**[21] UPPER PALEOLITHIC ADAPTATIONS IN EASTERN EUROPE**

This paper focuses on the diversity of Upper Paleolithic adaptations in European USSR and the implications that this record has for cultural practices in Eastern Europe between 40,000 and 10,000 BP. It discusses data from the Upper Paleolithic site clusters along the Dnepr, Don (Kostenko-Borschchevo region), Dnepr and its tributaries, and the southern steppe zone, comparing and contrasting archaeological remains in these different regions. It concludes by delimiting a number of different Upper Paleolithic archaeological cultures and examines their persistence through time.

*Preucel, Robert W. (Harvard)*

**[59] SEASONAL CIRCULATION AND DUAL RESIDENCE IN THE PUEBLOAN SOUTHWEST**

Southwestern archaeologists have long recognized mobility as an important factor in explaining the evolution of prehistoric agricultural systems. Changes in mobility are directly associated with agricultural land use (intensification and extensification) and crop selection (diversification and specialization). Yet very few studies have adopted a theoretical approach addressing the adaptive significance of mobility. This research focuses on one form of mobility, here termed seasonal agricultural circulation, which appears to have been widely distributed both in time and space throughout the Puebloan Southwest. It makes use of circulation theory drawn from the social sciences, particularly anthropology and geography. As a case study, patterns of seasonal agricultural circulation on the Pajarito Plateau (A.D. 1150–1550) are examined.

*Price-Beggerly, Patricia (US Army, University of Hawaii)*

**[47] KAHANA VALLEY, HAWAII: A GEOMORPHIC ARTIFACT**

Interdisciplinary research in Hawaii examines the interrelationships among geomorphic forms and processes and Polynesian land use and settlement. The research considers how early Polynesian manipulation of the landscape necessitated concomitant modification of their culture. I contend that Polynesian agriculture deforested the slopes of wet windward valleys. The denuded slopes were exposed to accelerated erosion and the transported materials were deposited on sand bars and dunes and in lagoons and bays. The former marine ecosystems, therefore, evolved into today's marshes and plains. Results from the research are used to examine early Polynesian adjustments to these rapidly changing environments.

*Prior, Christine (UC-Irvine Radiocarbon Laboratory) and Jonathon E. Ericson (UC-Irvine)*

**[68] OCEAN UPWELLING EFFECTS, FAUNAL CHANGES, SITE SOIL FORMATION RATES AND SETTLEMENT PATTERNS BY RADIOCARBON DATING AND CARBON ISOMETRY**

Conventional radiocarbon dates and carbon isometry are used to determine ocean upwelling effects, the occurrence of major changes of marine fauna, the rates of site soil formation processes, and the ages of sites in the Irvine Coast settlement pattern. Associated pairs of charcoal and marine shell provide data to evaluate upwelling effects along the coast.

*Propper, Judith G. (USFS)*

**[27] SAVING OR SHORTCHANGING THE PAST: ETHICAL ISSUES IN PUBLIC ARCHAEOLOGY**

The past twenty years have seen the emergence of many new career opportunities in the field of public archaeology. Those who choose to enter this arena have an opportunity to influence historic preservation decisions that directly affect the future of archaeological resources and, ultimately, our ability to understand the past. Inherent in this field are choices that bring civic or corporate responsibilities into conflict with deeply-rooted personal and professional values. What will be preserved? What will be sacrificed? And at what cost? What is the balance short- vs. long-term public good? These and other issues are examined.

*Purrington, Burton L. and David W. Benn (Southwest Missouri State)*

**[75] CORE AND PERIPHERAL SOCIETIES IN THE NORTHERN CADDOAN AREA: EVIDENCE FROM THE MISSOURI OZARKS**

Caddoan and Mississippian presence in the Ozark Highlands was more significant than once believed. However, the attenuated nature of occupations in the Missouri Ozarks suggest participation only in the initial stages of the Mississippianization process stopping short of the same levels of population aggregation, labor intensification, status differentiation, resource consumption, and ceremonial complexity seen in the Arkansas and Mississippi alluvial valleys. Late prehistoric Ozarks societies appear to have participated in regional systems in which they were technically equal but socially peripheral and politically subordinate to the Caddoan and Mississippian centers whose demands for surplus products they were constrained to meet.

*Putnam, D. (see Greiser, S.) [33]*

*Pye, Mary E. (Vanderbilt)*

**[109] THE EARLIEST CERAMICS AND COMPLEX SOCIETIES OF GUATEMALA**

Excavations at the site of El Mesak have broadened our understanding of the nature of the earliest ceramic cultures on the Pacific Coast of Guatemala. During the second season, substantial occupations of Locona and Ocos peoples (1500–1300 BC) were found, making this the site of the earliest ceramic complexes in the Republic of Guatemala. In addition, recent excavations have also revealed early public architecture—a ceremonial mound construction from the late Ocos phase. This evidence will be compared to similar, possibly related, sequences from other early societies in Mesoamerica.

*Quigg, M. (see Bousman, C. B.) [63]*

*Quilter, Jeffrey (Ripon)*

**[20] COMMUNITY FORMS AND SOCIAL SYSTEMS IN THE EARLY ANDES**

A variety of community organizations are known for the ancient Andes, from dispersed settlements to urban-like complexes to ceremonial centers. The Late Preceramic Period (ca. 2500–1800 B.C.) witnessed the first construction of large architectural complexes in Peru and it is generally assumed that social complexity also began during this time. The evidence for settlement types, shifts from fog-field zones to valleys, and the development of social complexity in association with monumental centers will be reviewed in this paper. It will be demonstrated that many of the previous assumptions can be challenged.

*Quilter, J. (see Sherman, E.) [47]*

*Quintero, Leslie (San Diego State)*

**[47] MODERN GAZELLE AND GOAT CEMENTUM AS SEASONALITY INDICATORS FOR THE NEOLITHIC LEVANT: A TEST AT 'AIN GHAZAL**

Seasonality standards composed of modern gazelle and goat dentition from the Levant are assessed to determine their usefulness as tools to estimate seasonality from archaeological faunal collections from the Levant. Focusing on the Early/Late Neolithic site of 'Ain Ghazal, incremental growth structures of the modern standards are used to estimate seasonal procurement behaviors and patterns of changes in these behaviors that may have occurred between the pre-ceramic and ceramic occupations of the settlement.

*Rafferty, Janet (Mississippi State)*

**[69] FROM SPEAR TO BOW: USING SERIATION TO ESTABLISH THE STRUCTURE OF TECHNOLOGICAL CHANGE IN NORTHEAST MISSISSIPPI**

The usual practice in examining cultural change is to assign artifact assemblages to internally homogeneous periods that incorporate considerable amounts of time and space. Seriation allows analysis of the structure of change over much smaller spatio-temporal units. In the Southeast, rapid replacement of the spear by the bow and arrow in Late Woodland times has been assumed. To study

this change, projectile points from sites in northeast Mississippi were seriated and a master chronology of assemblages constructed. Changes in point size, resharpening, and breakage over the sequence showed that the shift may have begun in the Middle Woodland period.

*Raish, Carol (USFS-Santa Fe)*

[40] DOMESTIC ANIMALS AND STABILITY IN PRE-STATE FARMING SOCIETIES

This study focuses on the organization of pre-state agricultural subsistence systems as reflected in their use of domesticated animal resources. Examination of 16 archaeological sequences from pre-state farming groups in the Old and New Worlds identifies a pattern of significantly shorter sequence duration for this period in the New World than in the Old World and Peru. One possible cause of this difference in duration may be the contributions of domesticated animals to economic stability. Ethnographic information is used to determine the contributions of animal domesticates. This study suggests that subsistence-level farming economies with domesticated animals are more stable, in terms of duration, than those without animals, which may lead to the shorter pre-state farming periods of the New World.

*Ramenofsky, Ann F. (New Mexico)*

[48] QUINCENTENARY RESEARCH IN PERSPECTIVE

Because the Columbian Quincentenary has stimulated considerable research in archaeology, history, ethnology, demography, and epidemiology, it is appropriate to question the long-term contributions of this research. Has contact period research substantially changed our assumptions or conclusions of the timing and nature of native population change? If research on the early contact period has changed our perceptions, than how do we integrate this knowledge into the fabric of our disciplines? If new knowledge has not changed our perceptions, then what reasons can be offered for this absence? I provide general answers to these questions in this paper. In addition, the context of individuals presentations is summarized.

*Rathje, William L. (Garbage Project-Arizona)*

[60] THE GARBAGE PROJECT AT 15

Archaeologists can use a materialist perspective on garbage to learn about the past and present. The cross-validation of ancient and modern garbage studies covers a wide range of research concerns, including, diet and health, patterns of food waste, hazardous waste in household refuse, demographic reconstructions from refuse, archaeological formation processes, and household-level recycling and reuse. Equally important is the Garbage Project's role in adding today's society to archaeology's long-term view of humankind. Direct one-to-one comparisons of refuse produce insights into the route which led to the present as well as possible trajectories into the future.

*Rattray, Evelyn (National University of Mexico)*

[02] THIN ORANGE CERAMIC PRODUCTION AND SOCIAL ORGANIZATION IN SOUTHERN PUEBLA

A recent settlement pattern survey and excavations in Tepexi de Rodriguez, Puebla have led to the discovery of Thin Orange ceramic production sites. Aided by stylistic, mineralogical (petrographic), and compositional (neutron activation) studies we have accumulated excellent data on the techniques of manufacture, the organization of the potters and the spatial distribution of the Ware throughout the region. The commercial aspects, particularly the relationships of this region of Mesoamerica to the great urban center of Teotihuacan will be addressed.

*Rautman, Alison E. (Central Michigan)*

[33] COPING WITH ENVIRONMENTAL VARIABILITY: SOCIAL NETWORKS AND CERAMIC EXCHANGE AT THE KITE SITE, CENTRAL NEW MEXICO

Effective cultural responses to risk involve adoption of coping strategies of a nature and scale sufficient to mitigate that risk. Here the structure of environmental variability is used as an independent predictor of the structure of effective cultural response. A model of modern climatic variability in central New Mexico is used to develop expectations regarding network formation and exchange for prehistoric cultivators at the Kite Site (LA-38448), which dates from about A.D. 900-1100. The climatic model provides the basis for identifying how social/cultural factors such as demography, technological organization, and economic structure affect adoption of a given coping strategy.

*Raven, Christopher (Intermountain Research)*

[07] THE CULTURAL LIFE OF SIGNIFICANT SOIL: A CONTEXT FOR WETLANDS ARCHAEOLOGY

A model of wetland-foraging strategy is generated and tested in the Carson Desert in the western Great Basin. Contrasts in foraging opportunities between Stillwater Marsh and its surrounding uplands suggest marshside residence in most seasons of most years, but some strategic departures from the

marsh were necessary. Subsistence resource values are estimated and their distributions calculated from existing soil types. The model discriminates between 30 biotically distinct habitats and defines specific suites of foraging strategies appropriate to each. The lesson of the exercise, currently being tested for its archaeological implications, is that the timing and intensity of exploitation of wetland habitats largely are functions of what is and what is not available in the surrounding landscape.

*Raven, Shelly (Intermountain Research)*

[47] DON'T QUARRY, BE HAPPY! ACTUALISTIC QUARRYING AND ITS IMPLICATIONS FOR SOCIAL ORGANIZATION AT TOSAWIHI QUARRIES, NORTHERN NEVADA

*Redding, Richard W. (Cranbrook Institute of Science)*

[46] TACTICS OF PIG USE IN THE ANCIENT MIDDLE EAST: MODERN ANALOGIES AND ARCHAEOLOGICAL EVIDENCE

The domestic pig was a common component of the prehistoric diet throughout the Middle East and North Africa. However, its use rapidly declined until the pig disappeared from the archeological record of the region. In the Nile Delta of Egypt it is common from the Late Neolithic, Predynastic, and Old Kingdom, however, in the Middle Kingdom the pig's importance declines until it is absent in the New Kingdom. Data in the literature on the reproductive behavior, productivity, and feeding behavior of feral pigs indicates that this shift reflects changes in human subsistence behavior related to increasing intensity of grain production.

*Redman, Charles L. (Arizona State)*

[46] SAMPLING, SEEDS, AND PHILOSOPHY: A WOMAN FOR ALL SEASONS

A personal viewpoint on the diverse contributions of Patty Jo Watson is presented. Reflections on her advocacy of scientific methods, concern for sampling, and commitment to interdisciplinary cooperation provide insight into her accomplishments and into the future of archaeology.

*Redmond, Brian G. (Indiana)*

[69] EMERGENT MISSISSIPPIAN SETTLEMENT AND SUBSISTENCE ADAPTATIONS IN THE LOWER OHIO VALLEY

The Emergent Mississippian period in eastern North America (ca.A.D. 700-1000) is commonly viewed as a transitional substage between Late Woodland and fully developed Mississippian cultures. A recent analysis of Yankeetown Phase spatial, environmental, and subsistence data has been used to construct a settlement-subsistence model that involved the intensive exploitation of the alluvial floodplain/terrace ecosystem of the lower Ohio River Valley. It is proposed that this model represents one form of an incipient or emergent Mississippian ecological adaptation that was based on the cultivation of maize and the exploitation of native aquatic and terrestrial food resources.

*Reed, Alan D. (Alpine Archaeological Consultants)*

[78] RESEARCH DESIGNS FROM A CONTRACTOR'S PERSPECTIVE

Archaeological contractors primarily prepare research designs to win contracts. Whereas this might seem mercenary, the end results are beneficial to archaeology and government cultural resource managers because competition tends to spur excellence. A high-quality research design is highly specific and delineates potential contributions and data requirements. It structures and hence simplifies field, analytic, and reporting tasks. Agency reviewers have an obligation to demand high standards for research designs. This will ultimately facilitate the selection of those contractors producing the highest quality research design, which will in turn meet the objectives of the Section 106 process and further meaningful contributions to archaeology.

*Reed, Heidi E. (New Mexico) and Timothy D. Maxwell (Museum of New Mexico)*

[65] DARWINIAN EVOLUTIONARY THEORY FOR ARCHAEOLOGY: SOME CONSIDERATIONS

Darwinian evolutionary theory provides archaeologists with a framework for the scientific study of change. However, several key issues require consideration. First, should the concept of culture be an appropriate subject of scientific inquiry. Second, if natural selection is defined as a pattern of differential persistence, it is not a causal agent. The assertion of selection operating is not sufficient; selective forces must be identified. Lastly, we suggest that fitness must be specified in clearly defined and measurable terms. Furthermore, we suggest a structure for research which facilitates the application of evolutionary theory to archaeological inquiry.

*Reed, Paul F. (Navajo Nation Archaeology Department)*

[79] CHANGING PATTERNS OF ANASAZI SETTLEMENT IN THE MIDDLE SAN JUAN FROM BASKETMAKER III TO PUEBLO III

Traditionally, the middle San Juan region has been overlooked when archaeologists discuss the "significant" subregions of Anasazi culture. Despite the lack of attention to this area, cultural resource

management work over the last several years has documented a considerable Anasazi presence. One of the more interesting observations revealed through a casual look at site distributions is the changing pattern of settlement from A.D. 400–1300. This paper attempts to quantify such settlement changes by employing a range of spatially-oriented, statistical techniques. The pattern that emerges from such an analysis indicates that considerable evolution of the settlement system occurred over time.

*Reese, K. V. (see Valdez, Jr., F.) [27]*

*Regester, Jeffrey and John Henderson (Cornell)*

[33] HYDROGEN PROFILES OF OBSIDIAN USING PROTON BEAM

Report on attempts to calculate hydrogen profiling of obsidian using PIXE and RBS against optical hydration determination. The obsidian artifacts used in these experiments are from Sula Valley of northwestern Honduras.

*Reher, Charles (Wyoming)*

[61] TIME AND TEMPO: CULTURAL DYNAMICS ON THE PREHISTORIC HIGH PLAINS

The NSF-supported High Plains Archaeology Project has completed three field seasons in southeast Wyoming investigating stratified campsites, bison kills, stone circle sites, defensive sites, rock alignments, rockshelters, Protohistoric burial grounds, historic sites and other site types. This paper concentrates on one aspect of the project, intensive recovery and analysis of microdebitage from large excavation blocks in deposits up to 6 meters deep. After adjustment for depositional rates and other factors, analysis of debitage densities leads to consideration of drastic fluctuations in occupational intensity, the timing and tempo of which may represent over two dozen episodes of population replacement over the last 11,000 years.

*Reid, Kenneth C. (Washington State-Pullman), John A. Draper (Washington State) and Peter E. Wigand (Quaternary Sciences Center-Desert Research Institute)*

[32] HUNTER GATHERER INTENSIFICATION IN EASTERN OREGON: EVIDENCE FROM THE SILVIES PLATEAU AND JOSEPH UPLAND

Eastern Oregon plateaus adjacent to pluvial lakes in the Harney basin and to the canyons of the lower Snake River offer scope to examine the pressure of growing regional population on a fixed resource base. Hunter gatherer "intensification" in the late Holocene has been linked to regional changes in fire history, to an increase in the variety and frequency of upland sites over times, even to the appearance of a native "agroecology" among the Wada Paiute. This paper summarizes recent archaeological and paleoenvironmental findings from north and south of the Blue Mountains relevant to the intensification theme.

*Reinke, Rita (Massachusetts-Amherst)*

[58] LANDSCAPE COMPOSITIONS: USE OF THE LANDSCAPE IN DEERFIELD, MASSACHUSETTS

Homelot landscapes in Deerfield show extensive changes through time. Many of these changes can be seen as responses not only to economic conditions, but to changing social relations as well. The use of homelot and village landscapes to demonstrate social position, real or desired, will be examined through the archaeological data from several field seasons of survey at Deerfield.

*Reynolds, Linda A. (USFS-Inyo)*

[47] CASA DIABLO: THE ONCE AND FUTURE QUARRY

The east side of the Sierra Nevadas is a volcanic landscape rich in obsidian flows utilized by prehistoric peoples. A programmatic treatment plan being developed by the Inyo National Forest for the management of obsidian quarries focuses on the Casa Diablo source; i.e., the glassy members of the resurgent dome of the Long Valley Caldera. Casa Diablo has supplied tool making material for both east and west side cultures from the mid-Holocene to the present. Based on specific regional research questions (e.g., trans-Sierran trade) and general questions pertaining to quarries worldwide, data categories for site recordation and evaluation are proposed.

*Rhodd, Ben (South Dakota State Archaeological Research Center)*

[27] ANTHROPOLOGICAL ETHICS: A PERSPECTIVE

The discipline of anthropology will be discussed from the perspective of the concerns of indigenous peoples. This paper outlines Native American views of ethnology and archaeology, including the study, treatment, and future disposition of human skeletal remains. Viable and workable ethics must be established that will create an atmosphere of responsible study. How do we define these ethics within the context of our discipline, retaining our focus on the study of human culture past and present? A perspective will be given.

*Rhode, David (Desert Research Institute)*

[38] INTRODUCTION: ASPECTS OF THE CULTURAL ENVIRONMENT OF THE SOUTHERN GREAT BASIN

This introduction to the southern Great Basin as a cultural environment outlines several themes which will be explored in greater detail by symposium participants. Among these themes are the spatial and temporal patterning of resources in the southern Basin and how that patterning affects the scale or regional settlement, and the relationships between use of arid southern Great Basin environments and settlement of better-watered regions adjacent to the southern Basin. These factors acted as selective constraints crosscutting the varying adaptations of southern Great Basin human inhabitants.

*Rice, Prudence M. (Florida)*

[13] THE SOCIETY FOR AMERICAN ARCHAEOLOGY AND THE ANTI-LOOTING EFFORT

A major goal of the Society for American Archaeology is to combat the evergrowing problem of vandalism and destruction of archaeological sites. Preservation of this resource base is important not only to professional archaeologists, but also to the public as a whole. One major step in its efforts to deal with this problem has been the Society's Save the Past for the Future project. However, this is only a beginning, and the Society as a whole, as well as every archaeologist as an individual, must continue the fight to save our archaeological heritage.

*Rice, Prudence M. (Florida) [Discussant 09]*

*Richner, J. (see Lynott, M.) [37]*

*Riddell, Francis A. (California Institute for Peruvian Studies)*

[34] EXCAVATIONS AT THE FARRALON ARTEL, CALIFORNIA

In 1949 an archaeological team from the University of California went to the Farralon Islands to excavate the site of the Russian-American Company artel. The findings of this team included indications of the habitations as well as a variety of artifacts used by Alaskan natives and Russian hunters (promyshlenniki) in the harvesting of seals and sea lions as a source of meat and materials to supply the favored food and raw materials needed by their fellow sea-otter hunters. This excavation data will be seen in a new light, with emphasis on the adaptations of the Alaskan natives to the harsh environment of the Farralones.

*Riford, Mary F. (Bishop Museum)*

[84] HAWAIIAN FISHPONDS: SHOWCASES OF RESOURCE WEALTH

The prehistoric Hawaiians developed a sophisticated aquacultural system with over 400 fishpond sites distributed throughout the main Hawaiian islands. Ethnographic sources suggest that larger fishponds became symbols of high status within the Hawaiian society and their resources were for exclusive use by royalty. The technology of the Hawaiian fishpond is contrasted with historically introduced methods of fish farming and historical records of fishpond yields to confirm that the Hawaiian fishponds were showcases of resource wealth and probably were not used for feeding the populace.

*Ringle, William M. (Davidson), Carlos Peraza Lope, Gabriel Euan Canul and David Ortegon Zapata (CRY-INAH)*

[12] EK BALAM AND ITS DEPENDENCIES: RESULTS OF THE 1989 SETTLEMENT SURVEY

Preliminary results of the 1989 phase of the Ek Balam, Yucatan, Mexico, settlement survey are presented. The settlement survey has focused on questions concerning man-land relations in eastern Yucatan, especially the prehistoric demography of Ek Balam, the size and distribution of its support population, the manner of urban-rural integration, and resource utilization. We here report new findings relative to these problems from survey of the residential sections of the city and the regional support zone. These include typologies of public and private architecture, and data concerning rural population concentration obtained from both secondary center and milpa surveys.

*Riordan, Robert (Wright State)*

[69] A CONSTRUCTION SEQUENCE FOR A HOPEWELL HILLTOP ENCLOSURE

Stratigraphic and radiocarbon dating evidence obtained from the Pollock Works, a Middle Woodland hilltop enclosure in southwest Ohio, has made it possible for the first time to document the development of a hilltop site's plan. Construction is believed to have occurred in four stages during the first century A.D., beginning with simple barrier wall placed across the approach to the plateau summit that was transformed into a more complex edifice incorporating gateways, exterior elements and a second, bluff edge wall. The implications of a phased construction program or the possible roles such sites may have played in the Hopewellian world are discussed.

*Rippeteau, Bruce (SC Institute of Archaeology and Anthropology) [Discussant 03]*

*Rocek, Thomas (Delaware)*

[05] EXAMINING THE PITHOUSE TO PUEBLO TRANSITION: THE DUNLAP-SALAZAR SITE, LA 51344, IN SOUTH-CENTRAL NEW MEXICO

The transition from pithouse to pueblo in the Southwest is widely thought to relate to sedentaryization, aggregation, and agricultural intensification. The occurrence of these putative correlates of the transition is tested where the transition "failed": in a portion of the Jornada Mogollon where pithouse villages persisted side by side with pueblos. Architectural and subsistence data from the Dunlap-Salazar pithouse site (ca. AD 1000) are used to compare sedentism, aggregation and agricultural intensification between contemporaneous and adjacent pithouse and pueblo occupation in the Capitan Mountains of South-Central New Mexico.

*Rodriguez, Camilo (FIABR)*

[09] LAS TRADICIONES ALFARERAS TEMPRANAS EN LA COSTA CARIBE COLOMBIANA

Periods and sequences proposed by other authors are discussed in light of excavations at the shellmound of Puerto Chaco, located on the lower Rio Magdalena. Ceramics date to 3200 BC (uncalibrated) for the middle occupation of the site, and current data supports interpretations for the greater antiquity of fiber-tempered ceramics. Traditions with mineral temper are later, and are accompanied by decoration and new vessel forms.

*Rogers, Anne Frazer (Western Carolina)*

[22] THE ELA SITE (31Sw5): A PREHISTORIC SOUTHERN APPALACHIAN VILLAGE

The Ela site (31Sw5), is located in the Southern Appalachian mountains near the Cherokee reservation in North Carolina. While this site has produced artifacts ranging from the Early Archaic through Historic periods, the major contribution of a recent mitigation project conducted there by Western Carolina University was the identification of structures and associated features dating from both the Connestee phase (Middle Woodland) and Qualla phase (Late Mississippian). These were uncovered by mechanically stripping much of the site. This paper describes the results of the excavation of 31Sw5, and discusses the contribution of this project in providing a better understanding of the archaeology of the Cherokee area.

*Rogers, J. Daniel (Smithsonian)*

[18] THE MATERIAL IMPLICATIONS OF CULTURE CONTACT: THE ARIKARA CASE

The rhetoric of the idealist-materialist debate has allowed little room for the development of a workable middle ground. By focusing on the historic period in the Northern Plains, it is possible to explore an approach that integrates a variety of explanatory elements. Disruptions in Arikaran society were intertwined with the flow of Europeans, conflicts in attitudes, the economics of fur trade, epidemics, fluctuations in natural resources, and warfare. Through a series of linking arguments, these and other factors reveal the extent to which artifactual variability through time in domestic contexts is structured by both ideational and material process.

*Rohrbaugh, Charles L. (Archaeological Consultants)*

[75] POPULATION AND CULTURAL DYNAMICS IN THE ARKANSAS RIVER REGION OF THE CADDOAN AREA

Focusing on Spiro phase, from A.D. 1250 to 1450, the development of Caddoan Culture is charted through the Mississippian period in the Arkansas River drainage of eastern Oklahoma. A perspective is offered which explains population and cultural dynamics in the area from the Middle Archaic to the historic period. Harlan, Spiro and Fort Coffee phase settlement and community patterns are discussed. Spiro phase is subdivided into Early and Late parts. The earlier component lasts from A.D. 1250 to 1385. The later component lasts from A.D. 1385 to 1450.

*Rollefson, Gary O. (San Diego State)* [Discussant 81]

*Rollefson, G. O. (see Davis, J.)* [47]

*Roney, John (BLM)*

[17] PREHISTORIC ROADS AND REGIONAL INTEGRATION IN THE CHACOAN SYSTEM

Many recent interpretations of prehistoric Chacoan roads stress their roles as a regional transportation and/or communication system, implying that they were constructed for these purposes. In fact, present evidence does not support the notion that most prehistoric roads are elements of a regionally integrated road system, and there is little reason to believe that they were built to facilitate transportation or communication. Instead, most roads are intimately related to local integration structures and it seems likely that their major role is in the realm of social organization. Ultimately the act of their construction may prove more important than their intended use.

*Roosevelt, A. C. (American Museum of Natural History)*

[18] HOLISTIC ARCHAEOLOGY IN AMAZONIA

From 1950–1975 Amazonian archaeology was dominated by feuding over methodology, with inconclusive results. Since 1975, a more comprehensive research strategy has been used to investigate cultural change there. Inductive study of collections and archives has documented important, previously unrecognized material and site patterning. Deductive field experiments, using settlement and geophysical survey, stratigraphic excavation, and analysis of biological remains and artifacts, has revealed significant temporal changes in demography, economy, ritual, and community patterns. The integration of a range of complementary interests—in human ecology and culture history as well as organization, ideology, and religion—has produced theoretically useful information. Roosevelt, A. C. [American Museum of Natural History] [Discussant 86]

*Rose, J. C. (see Barnes, J. E.)* [75]

*Rose, M. R. (see Durand, S. R.)* [33]

*Rose, R. O. (see Amick, D. S.)* [54]

*Rosenberg, Michael (Pennsylvania)*

[81] PALEOLITHIC VERSUS EPI-PALEOLITHIC SETTLEMENT IN THE MARV DASHT, IRAN

A 1978 survey of the Marv Dasht resulted in the discovery of 29 sheltered Paleolithic sites, 14 open air scatters, and numerous single finds. Middle and Upper Paleolithic sites occur over the entire survey area, and water, perhaps as a proxy for forests, may have been an important determinant of Upper Paleolithic site selection in the Marv Dasht. In contrast, there are fewer Epi-Paleolithic sites, and virtually all sites within a direct 25km distance of the largest Epi-Paleolithic site seem to have been largely abandoned during this period.

*Rosseau, Mike K. (Simon Fraser)*

[32] CHANGES IN HUMAN SEDENTISM, MOBILITY, AND SUBSISTENCE DURING THE PLATEAU PITHOUSE TRADITION ON THE CANADIAN PLATEAU

The Plateau Pithouse Tradition (3500 to 200 yr B.P.) was an era of relative cultural and adaptive stability during the late prehistoric period on the Canadian Plateau. However, within this lengthy and reasonably consistent tradition of logically-organized, semi-sedentary adaptations, three sequent periods representing distinct variations on a generalized adaptive theme can be discerned. Using recent archaeological and paleoenvironmental data, this paper presents an explicative model to account for changes in human sedentism, mobility, and subsistence between these three cultural horizons. The transition from the preceding middle prehistoric Lochmore phase to the Plateau Pithouse Tradition is also briefly discussed.

*Rothschild, Nan A. (Columbia), Barbara J. Mills (Northern Arizona), T. J. Ferguson (New Mexico) and Susan Dublin (CUNY-Graduate Center)*

[56] ABANDONMENT IN ZUNI FARMING VILLAGES

A group of villages on the Zuni reservation, used seasonally by farmers and herders, have been virtually unoccupied (but not necessarily abandoned) for 40–50 years. Two studies, ten years apart, have examined structures in these villages. This paper will consider a number of issues in relation to abandonment, which is seen on a continuum ranging from full occupation to use of a structure for storage, as a raw material source, or a means to maintain a claim to land. We will also discuss the measurable source, or a means to maintain a claim to land. We will also discuss the measurable architectural effects of lack of occupation, and what artifacts are left behind.

*Rudolph, James L. and Teresa P. Rudolph (UC-Santa Barbara)*

[69] THE FUNCTION OF WOODLAND PLATFORM MOUNDS: THE VIEW FROM THE LEAKE SITE

Archaeologists suffer from an unfortunate lack of interpretable data when it comes to Woodland platform mounds. In 1989, the University of Georgia excavated the remnants of a Middle Woodland platform mound at the Leake site on the Etowah River. Postmolds, numerous features, midden lenses, faunal remains, and botanical data allow us to infer the activities performed on this mound and, from these data, examine activities that did or did not take place on contemporary platform mounds in the Piedmont. This approach will provide a better understanding of the reasons for variability in these mounds.

*Rudolph, T. P. (see Rudolph, J. L.)* [69]

*Rue, David J. (WAPORA, Inc.)*

[02] THE MIDDLE PRECLASSIC IN THE CAVERNS OF COPAN

In 1983, members of the Proyecto Arqueológico Copán, Phase II, revisited two caves north of Copán initially explored by George Gordon in 1896. Skeletal analysis of the Middle Preclassic burials sampled

from one cave indicated that these individuals, mostly cremated burials, were in better health than the Late Classic population, and that the burial population cross-cut age and sex groups. Pollen analysis identified ritual offerings in the caves, both associated with and independent of burials. The evidence implies that socio-political systems in Middle Preclassic Copan were relatively egalitarian, but that some individuals may have been marked by achieved special status.

*Ruppe', Patricia A. and Carol B. Brandt (Zuni Archaeology Program)*

[05] SUBSISTENCE IN THE ZUNI RIVER VALLEY: THE ARCHAEOBOTANICAL DATA

A synthesis of archaeobotanical data from 18 archaeological sites in the Zuni River Valley reveals an agricultural record that extends from the late Archaic to the late Historic periods. Current models propose that population growth in the valley during the late prehistoric and historic periods should result in agricultural intensification and subsistence change. An examination of the archaeological data, however, indicates that the relative importance of maize agriculture varies little among all time periods. Even with the introduction of new cultigens and a cash economy in the late historic period, gathering remained an important component of Zuni subsistence.

*Russell, Glenn S. (UCLA)*

[25] PRECERAMIC THROUGH MOCHE SETTLEMENT PATTERN CHANGE IN THE CHICAMA VALLEY, PERU

Using refinements in the architectural and ceramic chronologies made during the first season of the Chicama Valley Settlement Survey, settlement pattern change from the Preceramic through Moche Periods is evaluated. Construction of the irrigation systems and a shift to defensive site locations during the Middle Formative suggest that competition over agricultural resources among local polities was important in the development of complex society. A shift to undefended site locations and major labor investments in ceremonial architecture indicate valley wide political control and integration by the Late Formative or Early Moche Period.

*Salcedo, T. (see Brumfiel, E. S.) [64]*

*Samples, Terry, David R. Wilcox (Museum of Northern Arizona) and John Hanson (USFS-Kaibab)*  
[73] COHONINA ARCHAEOLOGY: PAST AND PRESENT

The concept of a Cohonina culture was formulated in the 1930's by Hargrave, Colton and McGregor. It has been reinterpreted by Schwartz, Euler, Schroeder, Cartledge and others. Widespread intensive surveys by Kaibab Forest archaeologists in the last 15 years have laid the basis for new interpretations. Excavations by the MNA-NAU Field School show that regional expressions of Cohonina culture are much more diverse than previously thought. New models of subsistence-settlement systems are needed to account for the diversity.

*Sanchez, Guadalupe Miranda (Escuela Nacional de Antropologia e Historia)*

[70] LITHIC ANALYSIS AND ACTIVITIES AT TEPESTITLAN: A RURAL HABITATION AREA WITHIN THE TOLTEC STATE

This paper presents results of a functional lithic analysis of rhyolite tools and obsidian blade fragments recovered from the early Postclassic residential compound of Tepetitlan, on the outskirts of Tula, Hidalgo. The use-wear study is complemented by a distributional analysis of other archaeological materials, such as fibers, spindle whorls, food remains, and ceramics. The objective is to detect areas of activity and production in rural Tula, which can then be contrasted with the activities identified within the contemporaneous urban community of Tula.

*Sant, Mark B. and Andrew P. Fowler (Zuni Archaeology Program)*

[08] THE DEVELOPMENT OF AN ANASAZI REDWARE TRADITION: THE REGIONAL IMPLICATIONS OF SHOWLOW REDWARE

Recent ceramic analyses on collections from the N2007 project on Navajo Newlands indicate the indigenous production and development of an Anasazi redware tradition, defined as Showlow Redware. Analyses indicated that Showlow Redware developed out of locally produced brownware previously thought to have been Mogollon in origin. The production of Showlow Redware is identified as being regionally restricted. In addition, significant quantities of this material were identified on the near by Navajo Springs great house. The implications of this newly identified redware tradition are explored at the regional level.

*Sant, M. B. (see Marek, M.) [08]*

*Santley, Robert (New Mexico)*

[36] PREHISPANIC RESIDENTIAL ORGANIZATION IN THE BASIN OF MEXICO IN THE FORMATIVE AND CLASSIC PERIODS

*Saucier, Roger (Corps of Engineers) [Discussant 37]*

*Savelle, James M. (McGill) and Allen P. McCartney (Arkansas)*

[43] PREHISTORIC THULE ESKIMO BOWHEAD WHALE UTILIZATION

Recent coastal surveys in the central Canadian Arctic have provided evidence for extensive bowhead whaling and secondary whale bone utilization by prehistoric Thule Eskimos (ca. A.D. 1000-1600). Over 10,000 bowhead whale bone elements, representing a minimum of over 1025 individuals, are incorporated within a variety of processing, caching, and residential sites. A behavioral framework is presented to explain the distribution and abundance of bowhead elements within the various site types: 1) initial whale selection; 2) initial processing; 3) bone selection for immediate use; 4) bone selection for future use; 5) dwelling construction and maintenance; 6) recycling of bone elements; 7) post-abandonment decay and burial.

*Savulis, Ellen-Rose (Massachusetts-Amherst)*

[58] ALTERNATIVE VISIONS AND LANDSCAPES: ARCHAEOLOGY OF THE SHAKER SOCIAL ORDER AND ITS BUILT ENVIRONMENT

The success of the Shaker movement was directly related to its ability to create distinct, replicable communities incorporating the metaphor of the family. This ability enabled the Shakers to challenge relations of power and domination within the institutions of mainstream society. Contradictions between theories of power and gender were played out within male/female and secular/sacred arenas of the Shakers' spiritual and temporal world. Social tensions arising from the transformation of a gender-balanced movement to one dominated by women are reflected in the Shaker built environment.

*Sayler, R. D. (see Ahler, S.) [30]*

*Scarry, John (Florida Bureau of Archaeological Research)*

[11] SETTLEMENT HIERARCHIES AND ADMINISTRATIVE HIERARCHIES: RECONCILING ARCHAEOLOGY, ETHNOHISTORY, AND THEORY FOR THE APALACHEE CHIEFDOM

Archaeological and ethnohistorical data from Apalachee, a Mississippian chiefdom in the southeastern U.S., have been interpreted as indicating that the Apalachee had a four-tiered settlement hierarchy and three administrative levels above the household. These interpretations cast doubt on models of chiefdom organization and the common practice of investigating political structure by equating settlement hierarchies to administrative hierarchies. The Apalachee data are re-examined and alternative interpretations presented. These interpretations are more in accord with theory, but they suggest that caution be exercised when attempting to measure complex phenomena such as political and demographic organization along discontinuous scales.

*Schoaf, C. B. (see Shimada, I.) [76]*

*Schaafsma, Polly (Museum of New Mexico)*

[44] WAR IMAGERY AND MAGIC: PETROGLYPHS AT COMANCHE GAP, GALISTEO BASIN, NEW MEXICO

Southern Tewa Pueblo IV petroglyphs ca.(A.D. 1350 -1525) on the basaltic dike at Comanche Gap in the Galisteo Basin, New Mexico exhibit an unusual emphasis on war-related iconographic themes. Archaeological data and 16th century Spanish accounts suggest that these eastern Pueblos were harassed by Plains groups occupying the western High Plains to the edge of the Sangre de Cristo Mountains during this period. War magic and defense are suggested functions of this site, based on imagery content and the site situation within the landscape.

*Schafer, D. (see Brumfiel, E. S.) [64]*

*Schaller, D. M. (see Abbott, D.) [33]*

*Schambach, Frank F. (Arkansas Archaeological Survey)*

[75] THE "NORTHERN CADDOAN AREA" WAS NOT CADDOAN

The so-called Northern Caddoan area comprises parts of three culture areas. In the Arkansas Valley Lower Mississippi Valley habitat and Mississippian peoples extended westward to the Forks of the Arkansas in Eastern Oklahoma. To the north of the Arkansas Valley is the Ozark Highlands region, with a distinctive upland Mississippian tradition that encompassed northeastern Oklahoma, northwest Arkansas and southwest Missouri. South of the Arkansas was the Ouachita Mountain region, occupied by the northernmost Caddoan peoples.

*Scheetz, Barry E. (Penn State), Christopher Moore Stevenson (Archaeological and Historical Consultants) and K. Vadem (Penn State)*

[33] SPECTROSCOPIC ELLIPSOMETRY: AN ALTERNATIVE ANALYTICAL METHOD TO ACHIEVE ANGSTROM RESOLUTION OF OBSIDIAN HYDRATION RIMS

Optical methods of measuring hydration rims are prone to a wide variety of problems. Principal among these is the limitation of optical microscopy and the establishment of well defined boundaries

between the hydrated and unhydrated glass. The methodology used to establish obsidian hydration rates are often based on relatively thin hydration rims, a procedure which is prone to the above mentioned problems. An alternate characterization technique is being explored which, if fully developed, will allow "non-destructive" hydration rim measurements to be made with a resolution at the angstrom level. This presentation represents the preliminary attempt to apply spectroscopic ellipsometry to the measurement and interpretation of induced hydration rims on obsidian.

*Schelberg, John D. (US Army Corps of Engineers)*

[78] RESEARCH DESIGNS: TOOLS FOR EVALUATION BUT DO THEY PROMOTE SCIENCE?

The research design in a technical proposal is the most important portion of the proposal. Proposals for an Albuquerque District, Corps of Engineers, undertaking are reviewed by an interagency committee which evaluates the research designs with respect to research problems specified in the solicitation, and against each other. Recurring problems include poorly formulated hypotheses and test implications; wholesale importation of a "fall back" model; disregard for ecological relationships; lack of a meaningful regional approach; and failure to be realistic about what can and should be accomplished.

*Schiavitti, V. (see Fletcher, T.)* [65]

*Schiffer, Michael B. (Arizona)* [Discussant 56]

*Schild, R. (see Wendorf, F.)* [86]

*Schlanger, Sarah (Museum of New Mexico) and Richard H. Wilshusen (Colorado-Boulder)*

[56] LOCAL ABANDONMENTS AND REGIONAL CONDITIONS IN THE NORTHERN AMERICAN SOUTHWEST

The archaeological record of the American Southwest is replete with abandoned places that once supported a vigorous population of horticulturalists under trying environmental conditions. These same conditions are often suggested as a cause of the abandonments. Do the circumstances of structure and site abandonment support this? Data from the Dolores Archaeological Program are used to compare the abandonment histories pertaining to particular structures with models of external environmental conditions and demographic shifts that redistributed people across the local landscape. Architectural features, stratigraphic sequences, and the composition of artifact assemblages from sealed deposits are used to evaluate abandonment circumstances and the fit between abandonment events and environmental conditions.

*Schlanger, S. (see Larralde, S.)* [59]

*Schmidt, Peter R. (Florida-Gainesville)*

[18] HOLISTIC ARCHAEOLOGY: A NATURAL ALTERNATIVE TO THE PROCESSUAL/POST-PROCESSUAL DICHOTOMY

The birth of Processual archaeology during the 1960s was marked in part by the rhetoric of "Archaeology is Anthropology." This rhetorical position soon gave way to a preoccupation with scientific specialization that has intellectually balkanized the discipline and led to the overreaction of Post-Processualists. Meanwhile, there has been a cadre of anthropologists, scattered through the world, who practice an archaeology that draws its inspiration from the catholic perspective that affirms anthropology. This paper draws from a two decade-long holistic, synthetic, anthropological archaeology in Eastern Africa.

*Schneider, Kent and L. W. Braddock (USFS)*

[52] COST-SHARE: TREASURE CHEST OR PANDORA'S BOX?

The Challenge Cost-Share program set out by the Chief three years ago has given the Southern Region CRM program a boost in academic and public archeology programs. Summer fieldschools, interpretive programs, restoration of historic buildings, have become possible by the matching of federal and private sector dollars. Behind these good things are drawbacks not envisioned when the program started. This paper examines the amount of personal and government time invested in finding partners and managing projects, and the impact to long term projects.

*Schortman, E. M. (see Urban, P. A.)* [36]

*Schreiber, Katharina J. (UC-Santa Barbara)*

[77] THE WARI OCCUPATION OF THE NASCA VALLEY: A PRELIMINARY ASSESSMENT

The Wari occupation of the Nasca Valley was substantially different from that of nearby highland regions. Recent survey in Nasca has revealed a series of Wari sites, none of which evidence typical Wari administrative architecture, as known in the highlands. Rather, sites are irregular in layout, and located apart from local settlement, sometimes in defensible locations. This suggests a different level of interaction between Wari and the people of Nasca than is seen in the highlands. Despite the strong

stylistic ties between Wari and Nasca, there is yet no clear evidence of direct political control of Nasca by the Wari Empire.

*Schroedl, Gerald (Tennessee)*

[83] EXPERIMENTAL STUDIES IN PIT-FEATURE DETERIORATION

Despite the abundance of pit-features in the archaeological record, there is surprisingly little information about the natural and cultural processes involved in their deterioration and filling. To provide insight into these processes, I describe observations made during the past three years on 26 experimental pit-features. Using geological theory of slope formation, it is possible to identify and describe the deterioration processes responsible for pit-feature morphology with greater precision and improved reliability. Doing so provides guidelines for assessing the degree to which archaeological examples of pit-features represent their original morphology.

*Schulz, Peter D. (California Department of Parks and Recreation)*

[07] ARCHAEOLOGICAL PERSPECTIVES ON NATIVE CENTRAL CALIFORNIA INLAND FISHERIES

Ethnographic accounts of the native inland fisheries of Central California have concentrated on the exploitation of salmon and the importance of this resource to aboriginal subsistence. Archaeological investigations in the lower Sacramento Valley, however, fail to confirm this model. Abundant fish remains from several sites, ranging in age from ca. 500 B.C. to historic times, document an emphasis on lake and slough species (especially Sacramento perch and thickettail chub) on the valley floor, and a shift to riverine species in the foothills. Ethnographic and environmental implications of this evidence are discussed.

*Sciscento, Margaret M. (UC-Santa Barbara)*

[77] WARI HEGEMONY IN THE CHUQUIBAMBA VALLEY, PERU

It has always been assumed that there was a large Wari occupation in the Chuquibamba Valley of the southern highlands of Peru. Recent survey and surface collections in the valley indicate that Wari influence there was indirect. Whereas there are many Wari ceramics in the valley, there appear to be no Wari sites.

*Sciulli, P. W. (see Orr, M. R.)* [61]

*Scott Cummings, Linda (Paleo Research Laboratories) and Lisa Panet Klug (The Keith Companies)*

[68] ARCHAEOBOTANICAL ANALYSIS OF PREHISTORIC SITES ON THE IRVINE COAST

Pollen, phytolith, and macrofloral studies were conducted to identify vegetation and paleoenvironmental conditions during occupation of the Irvine Coast. Ethnographic information for local Amerindian groups documents use of native seed plants that no longer occur in the area. To date, no extensive archaeobotanical investigations have been conducted for this area to characterize native plant use. Pollen and flotation samples were obtained from hearths, groundstone tools, and midden deposits. Analysis of the botanical materials was used to reconstruct the range of prehistoric plant procurement systems through time and the intrasite spatial variation of activity areas.

*Scott, IV, Robert F. (US Army Corps of Engineers) and Fred Valdez (Texas-Austin)*

[74] SUBSISTENCE AND CULTURE CHANGE IN THE TERMINAL CLASSIC TO EARLY POSTCLASSIC MAYA LOWLANDS: THE COLBA CASE

The decline of Lowland Maya civilization ca. AD 850–900 saw a reoccupation of many sites in the Early Postclassic. The difference in adaptation by new populations in the lowlands (after AD 900) is reviewed. Colha in northern Belize provides much valuable data for both periods and is here used as a basis for interpretations. Subsistence systems (procurement and technology) of the Classic Period occupations are contrasted with those of the Postclassic inhabitants. Explanations for the differences observed in Classic and Postclassic subsistence strategies (i.e., adaptations) are posited.

*Scott, Barbara (Minnesota)*

[29] VIKING HOUSES AND THE VIKING SPIRIT

The Northern Isles of Scotland are rich in archaeological remains from the Neolithic to the Middle Ages. This richness makes it possible to compare structures from different periods. This paper examines the striking difference in the shape and organization of space in Pictish and Viking houses. These differences are particularly interesting since many of the structures were contemporary. Other aspects of Viking culture, such as the outlook on life described in the sagas, will be explored in an attempt to explain the organization of space in Viking houses.

*Seabloom, R. W. (see Ahler, S.)* [30]

*Sebastian, Lynne (SHPO-New Mexico)*

[17] CHACO CANYON AND THE ANASAZI SOUTHWEST: CHANGING VIEWS OF SOCIOPOLITICAL ORGANIZATION

For many years, the ruins in Chaco Canyon were viewed as an anomaly, a unique expression of architectural density and cultural elaboration in an otherwise dispersed and small-scale archaeological record. With the discovery that the San Juan Basin contained a number of "outliers," Chaco Canyon came to be viewed as the center of a basinwide social/political system. Recent discoveries of sites morphologically identical to Chacoan outliers throughout the San Juan region have given rise to questions about "Chaconess" of outliers and the nature of the links between these sites and Chaco Canyon. This paper will consider the political implications of these changing views of the role of Chaco Canyon in the Anasazi world.

*Shackley, M. Steven (Brian Mooney Associates)*

[05] EARLY HUNTER-GATHERER PROCUREMENT RANGES AND MOBILITY IN THE AMERICAN SOUTHWEST

While recent studies of early hunter-gatherers in the Southwest have greatly expanded our knowledge of mobility and paleoecology, very little effort has been expended toward reconstructing the spatial ranges of these early groups. Through a technological and geochemical provenience analysis of obsidian artifacts from 26 early hunter-gatherer contexts in Arizona, a much better understanding of the procurement ranges in Paleoindian through Late Archaic periods is now possible. While significant changes in the character of ranges occurred through time commensurate with changes in mobility, a consistent upland and lowland range is evident during all periods quite similar to ranges exploited by regional ethnographic groups.

*Shackley, M. Steven (Brian Mooney Associates)*

[33] EARLY HUNTER-GATHERER PROCUREMENT RANGES AND MOBILITY IN THE AMERICAN SOUTHWEST: EVIDENCE FROM OBSIDIAN GEOCHEMISTRY AND LITHIC TECHNOLOGY

While recent studies of early hunter-gatherers in the Southwest have greatly expanded our knowledge of mobility and paleoecology, very little effort has been expended toward reconstructing the spatial ranges of these early groups. Through technological and geochemical provenience analysis of obsidian artifacts from 26 early hunter-gatherer contexts in Arizona, a much better understanding of the procurement ranges in Paleoindian through Late Archaic periods is now possible. While significant changes in the character of ranges occurred through time commensurate with changes in mobility, a consistent upland and lowland range is evident during all periods quite similar to ranges exploited by regional ethnographic groups.

*Shafer, Harry J. and Vaughn M. Bryant, Jr. (Texas A&M)*

[28] SOUTHERN NORTH AMERICAN ARCHAIC CULTURAL AND ENVIRONMENTAL DYNAMICS: INTRODUCTION

Some of the ancient populations which gave rise to the Formative cultures in Mesoamerica and the American Southwest had their beginnings in the arid foothills and basins of the Sierra Madres, and Basin and Range respectively. To date the origin and lifestyles of these early hunting and gathering cultures have never been well understood. Yet, these were among the oldest continuous cultural traditions in North America. This symposium explores the dynamics of the environment, human cultural history, and lifeways to establish a baseline of archaeological knowledge for this poorly known region of southern North America.

*Shafer, H. J. (see Dockall, J.) [70]*

*Shanks, Michael (Cambridge)*

[31] MATERIAL CULTURE AND WRITING THE PAST: ASPECTS FROM ARCHAIC GREECE

The paper will trace the social logic of ceramics found in mortuary and votive deposits associated with colonization and crisis in the Archaic aristocratic states of Greece in the 8th and 7th centuries BC. The aim is to move on from mortuary analysis which correlates material culture patterning with social structure, and from the focus of structural archaeologist on ideology and superstructure, to locate the symbolic within a more general conception of the economy. The question will be addressed as to how the past is to be written given recent discussions of history conceived as text and the historical and political location of textuality.

*Shaw, Jr., Chester W. (Arizona)*

[47] TREE-RING BASED SUMMER DROUGHT ESTIMATES FOR THE PINELAWN/RESERVE AND MIMBRES REGION IN NEW MEXICO

Prehistoric tree-ring chronologies for the Cibola- and Mimbres-Mogollon regions in New Mexico are used to produce July drought estimates. These estimates reveal different patterns in the timing

and duration of summer droughts in western New Mexico. Given these findings, theoretical views concerning "risk management" behavior in the prehistoric Southwest, and how this behavior likely impacted the adoption of agriculture, need reassessment. Modern and prehistoric geophysical data from the southernmost reaches of the central Southwest are used to suggest why prehistoric populations residing here may have aggressively moved toward the adoption of maize agriculture during the Late Holocene.

*Sheehan, Michael S. (SUNY-Buffalo)*

[72] AQUIFERS AND PLAINS EARLY ARCHAIC ADAPTATION TO THE ALTITHERMAL

One view of Early Plains Archaic adaptation the hot and dry Altithermal focuses on altered vegetative communities. Altered vegetative communities in turn affected the distribution of Plains herbivore populations, particularly bison, that comprised the core of Plains Early Archaic subsistence. The view presented here suggests a more direct link between the Altithermal and cultural adaptation to it. Portable water is a key factor in cultural adaptation to arid conditions. Therefore the distribution of Early Archaic sites may reflect increased emphasis on predictable water supplies offered by aquifers. The spatial association of Early Archaic sites and aquifers is tested statistically.

*Sheehy, J. J. (see Widmer, R. J.) [36]*

*Sheets, Payson D. and Brian R. McKee (Colorado-Boulder)*

[02] HOUSEHOLD ARCHAEOLOGY AT CEREN, EL SALVADOR

Excavations at the Cerén site, El Salvador, encountered three Classic Period households buried by Laguna Caldera Volcano's AD 600 eruption. Each household utilized multiple structures for specific activities. Domestic adobe architecture was surprisingly sophisticated, with large platforms, puddled adobe and wattle-and-daub walls, solid columns, and large benches, cornices, and niches. Many utilitarian items, including obsidian blades and biconically perforated stone mortars, were stored on walltops, rafters, or in thatch roofing. Grains, food residues, insects, and rodents were found in vessels. Other fauna include domestic dog and duck. The remains of a codex was found in a niche.

*Shelley, Phillip H. (Eastern New Mexico) [Discussant 15]*

*Shelley, P. H. (see Durand, S. R.) [33]*

*Shelley, Steven (Statistical Research)*

[24] BASKETMAKER III SOCIAL ORGANIZATION: AN EVALUATION OF POPULATION, AGGREGATION AND SITE STRUCTURE

In a recent article in American Antiquity W.H.Wills and Thomas Windes argue that Shabik'eschee Village in Chaco Canyon may represent an episodic aggregation of local groups rather than a sedentary occupation by a single social unit. They also argue that such aggregations were rare. Evidence from recent excavations suggest that a number of similar aggregations occurred circa A.D. 500–700 along the Chuska Mountains. Based on these evaluations and an examination of the literature, certain details of their reconstruction are questionable, however, their basic model is supported.

*Sherman, Elaine (Nevada-Reno) and Jeffrey Quilter (Ripon)*

[47] AN ANALYSIS OF CHIPPED STONE TOOLS FROM THE THIEL SITE: A LAKE WINNEBAGO PHASE ONEOTA HABITATION

The Thiel Site is a Lake Winnebago Phase Oneota habitation site located on the western shore of Lake Winnebago in Winnebago County, Wisconsin. The lithic material from the site consists primarily of triangular projectile points and a variety of small scrapers. To our knowledge, this is the first comprehensive analysis to be done on Oneota chipped stone tools. As a result of this analysis, two previously unrecognized tool types were recorded, and new questions raised concerning the variations that occur in the form and working edges of thumbnail scrapers found in this area.

*Shifrin, Lisa (Washington State)*

[80] FUNCTIONAL ANALYSIS OF CERAMIC VESSELS FROM A NINTH CENTURY PUEBLO SITE IN SW COLORADO

Excavations at the Duckfoot Site, a small Pueblo I period Anasazi settlement in Southwestern Colorado, yielded an entire abandonment assemblage comprising 79 whole or partial vessels and 48 sherd containers from an occupation abandoned approximately A.D. 875 to 880. This study reports a functional analysis of this assemblage, with respect to morphology and mechanical performance characteristics, use-wear, and surface residues. The data are used to compare culinary and storage practices at surface room vs. pithouse contexts within Duckfoot Site, and between Duckfoot Site and contemporaneous Anasazi settlements in the Dolores River Valley.

*Shimada, Izumi (Peabody Museum), Crystal B. Schaaaf (Air Force Geophysics Laboratory), Lonnie Thompson and Ellen Mosley-Thompson (Byrd Polar Research Center)*

[76] CULTURAL IMPACTS OF SEVERE DROUGHTS IN THE ANDES: APPLICATION OF 1500-YEAR PRECIPITATION RECORD FROM ICE CORES

A recently established 1500-year annual precipitation record based on ice core samples from the Quelccaya glacier in southern Peru allows assessment of the possible role of climatic disturbances in much of Peru which is in a single climatic regime. Notable among detected disturbances is one of the severest droughts of the past 1500 years, spanning A.D. 562 and 594. Major cultural upheavals including Nasca 7-8 and Moche 4-5 drastic settlement shifts may well have been conditioned by this drought. Possible effects of another severe, multidecadal drought in the mid-11th century are also considered.

*Shubin, Valery O. (Sakhalin Regional Museum)*

[34] THE MATERIAL AND SPIRITUAL CULTURE OF KODIAK ESKIMOS (ALEUTS) ON THE KURILE ISLANDS

The Kurile Islands form the southwestern extent of the Russian-American Company's operations in the North Pacific. The interaction of the Russian and Aleut cultures with particular emphasis on the retention of Aleut customs and technology will be discussed. The northern areas of the sites has allowed for remarkable recovery of structural remains and artifacts. Many remnants of the practical hunting culture as well as the magical elements of the spiritual culture of this displaced people have been recovered in a series of excavations.

*Sierzchula, M. (see Lafferty, R.) [22]*

*Sievert, April K. (Northwestern)*

[70] INVESTIGATING CATEGORIES OF PRODUCTION USING LITHIC DATA: A CASE FROM THE MAYA POSTCLASSIC PERIOD

There are three qualitatively distinct categories of craft production directed toward manufacturing subsistence, ornamental and ritual objects. Stone tools are employed in each category of craft production. By combining morphological and functional data from stone tools with ethnographic data, a scheme for distinguishing the incidence of tool use in various specialized industries is devised. Using this framework, analysis of lithic materials of the Postclassic Maya of the central Peten lakes region approaches a reconstruction of general patterns of commodity production, which can then be evaluated using independent evidence from ceramic and other archaeological indicators.

*Sikes, Nancy E. and Stanley H. Ambrose (Illinois-Urbana)*

[47] SOIL CARBON ISOTOPE EVIDENCE FOR HOLOCENE HABITAT CHANGE IN THE KENYA RIFT VALLEY

Carbon-13 values of 13 soil profiles along an altitude transect between 1900 m and 3000 m were measured at four intervals between the surface and 55 cm. The transect spans the C4 grassland to C3 forest transition zone. Currently forested sites above 2400 m and below 3000 m supported semi-open grasslands during the middle Holocene. This demonstrates that the forest/grassland ecotone, currently located below 2400 m, was higher than 2700 m during this time. Mid-Holocene dry phase hunter-gatherer settlements also shifted to higher altitudes at this time. The soil carbon isotopic evidence supports the model of ecotonal settlement preference for Holocene hunter-gatherers in the Central Rift Valley.

*Silverman, Helaine (Illinois) and David Browne (Royal Commission on Archaeological Monuments in Wales)*

[77] NASCA AND WARI SOCIOPOLITICAL DYNAMICS AND SETTLEMENT PATTERNS IN THE NORTHERN VALLEYS OF THE RIO GRANDE DE NAZCA DRAINAGE, SOUTH COASTAL PERU

In 1987-89 we carried out survey in the northern valleys of the Rio Grande de Nazca drainage. Our complementary projects were designed to provide basic data on the full range of cultures that flourished in this region in the prehispanic era. Within our total sample of approximately eight hundred sites are several that shed important new light on Nasca-Wari interaction. On the basis of existing radiocarbon measurements, iconography, economic shifts, changes in the pattern of trophy-head taking, and change in settlement pattern we propose that Wari impacted Nasca during florescent Nasca 5 period, rather than following Nasca 8 as the current dogma holds. This temporal realignment necessitates consideration of a model of initial Nasca-Wari coexistence rather than immediate conquest and incorporation.

*Simmons, Alan H. (Desert Research Institute)*

[22] NEOLITHIC ADAPTATIONS IN THE EASTERN LEVANT: EVIDENCE FROM 'AIN GHAZAL AND WADI SHU'EIB, JORDAN

Recent excavations at major Neolithic centers in Jordan have changed our understandings of early village life. Studies at 'Ain Ghazal and Wadi Shu'eib suggest an adaptive strategy distinct from that in Israel. The Jordanian sites are huge and contain unbroken occupational sequences from Pre-Pottery Neolithic to Pottery Neolithic. These sites were abandoned after the Neolithic. A model of culturally induced environmental degradation and subsequent pastoral exploitation of the eastern steppes, which were unavailable to Neolithic peoples further west, has been proposed as one scenario to explain the abandonment. The sites and the model are reviewed in this paper.

*Simmons, Alan H. (Desert Research Institute) [Discussant 79]*

*Simmons, A. H. (see Davis, J.) [47]*

*Simms, Steven (Utah State)*

[07] THE FREMONT/LATE PREHISTORIC TRANSITION AS SEEN FROM THE GREAT SALT LAKE MARSHES

Between AD 1250-1350 in the marshes along the Great Salt Lake, Fremont agriculture/hunting and gathering yielded to full time hunting and gathering which persisted through the Late Prehistoric period. Declining precipitation represented by regressive lake levels negatively influenced agriculture while doubling available marshland. In response, the adaptive strategy shifted from a central base collector strategy featuring agriculture toward a collector strategy featuring smaller group size, increased residential mobility, and decreased logistic mobility. Explanations for why agriculture failed to return during later transgressive lake levels are explored as necessary to a full explanation of the earlier transition.

*Simons, Steven and Rose Milovich (Utah State)*

[61] I SEE THEIR DUMP, BUT WHERE'S THE TOWN? THE STRUCTURE OF THE BUSTOS WICKIUP SITE

The Bustos site near Ely, Nevada consists of five juniper log structures estimated to date between A.D. 1750-1800. Few artifacts were found in and among the structures. However, large areas of dense lithic debris, eight stone rings for pine nut storage, and other debris form a distinctive spatial pattern around the structures. Stumps and a partially burned and chopped, but standing juniper accompanied by a stone axe, testify as to the method of cutting logs. In one sense, only the people are missing and the site is examined as an "ethnoarchaeological" situation to site structure studies.

*Simon, Arleyn W. (Arizona State)*

[22] VARIATION AND COMMONALITY AMONG SALADO WARES IN CENTRAL ARIZONA

Salado ceramics (ca. AD 1300-1450) from the Roosevelt Lake area of central Arizona include diverse examples of plain, corrugated, and decorated wares. This research seeks to define variation and commonality within a full ceramic assemblage of Salado wares. The relationships among ceramic production, function, and provenance are examined across wares, local and nonlocal products. Direct physical property testing of these prehistoric samples is used to compare the suitability and durability of different vessel classes for certain tasks. The associations of physical properties with vessel form, production techniques, and materials is examined.

*Simon, Brona G. (Massachusetts Historical Commission)*

[11] NATIVE AMERICAN CULTURE CHANGE AND PERSISTENCE IN CONTACT PERIOD NEW ENGLAND: ANALYSIS OF MORTUARY DATA FROM A PRAYING INDIAN BURIAL GROUND IN MASSACHUSETTS

An archaeological investigation of a 17th-18th century Praying Indian burial ground in Canton, Massachusetts provides new data relevant to the study of culture contact. Archaeological data concerning the position of burials, layout of graves and grave goods is presented. Population demography and pathologies are revealed through physical analysis of the skeletal remains. Analysis of mortuary practices, population demography and archival documents furnish new insight into changes in Praying Indian society, culture and religion, as well as evidence for the continued persistence of traditional beliefs and customs during the Contact Period.

*Sims, Cort (USFS)*

[52] PARTNERS IN TIME

In 1904, residents of the Marble Creek valley organized themselves for the purpose of killing homestead claim jumpers. Eighty-four years later, local residents of this northern Idaho valley formed another group—this time to celebrate the state centennial by interpreting historic sites, including

the grave of one of the murdered claim jumpers. This three-year project involves oral history research, photograph collection, the construction of interpretive trails, roadside exhibits and a major interpretive site development. Construction is now underway and is planned for completion during the summer of 1990.

*Skibo, J. M. (see Aronson, M.) [22]*

*Skinner, Elizabeth (Navajo Nation Archaeology Department) and Robert J. Jackson (SHPO-California)*

[33] A CRITICAL REVIEW OF OBSIDIAN HYDRATION SAMPLING STRATEGIES IN CALIFORNIA AND THE GREAT BASIN

Obsidian hydration is a commonly used—and misused—dating technique in the western United States. Obsidian hydration sampling strategies generally have little or no relationship to research questions and the results are used uncritically, which can seriously affect interpretation of site use and function. Obsidian hydration is in fact a complicated process, and obsidian hydration sampling designs need to take into account such variables as site formation processes, climatic variability, technology, and prehistoric scavenging and reuse. Various sampling strategies and the conclusions drawn with each are discussed, along with suggestions for sampling that consider the above-mentioned variables.

*Skinner, Elizabeth (Navajo Nation Archaeology Department)*

[08] EARLY POINTS ON LATE SITES: FUNCTIONAL CONTINUITY, SCAVENGING, OR CURATION?

A common occurrence on surveys in the Four Corners area is the recovery of morphologically early projectile point forms on Anasazi sites. Various hypotheses for this phenomenon include functional continuity, scavenging and reworking, and curation. Recent surveys in the "New Lands" have shown this pattern to be present. Data generally collected within a CRM framework are clearly insufficient to address the problem; data needed, within an ideal research framework, include recovery of small debitage, results of use-wear and technological analyses, and recovery of large numbers of points. The "New Lands" research design allows for a compromise between the two constructs.

*Slawson, Laurie V. (Cultural & Environmental Systems, Inc.)*

[05] AN EXAMPLE OF ENVIRONMENTAL ADAPTATION: HOHOKAM DRY-FARMING AGRICULTURE IN THE SOUTHERN SALT-GILA BASIN

Recently completed survey work identified a previously unknown extensive dry-farming agricultural system built by the Hohokam in the Santa Mountains southeast of Phoenix, Arizona. The components of the system, including checkerboard fields, rock pile fields, and massive water diversion dikes and channels, represent an elaborate, labor-intensive solution to the problem of subsistence farming in a hostile environment. The agricultural system and its component parts are described and theories are presented concerning how it worked and what role it may have played in the regional subsistence-settlement system of the southern Salt-Gila Basin Hohokam.

*Sleeter, Richard (Rio Abajo Archaeological Services)*

[15] NEW MEXICO'S VANISHED TOWER DWELLERS REVISITED

A recent regional study on the prehistoric towers from the Gallina area revealed that the prehistoric culture participated in alliance activities in the form of communication links. In this study, locational data taken from tower sites was utilized to determine if the towers were built within line-of-sight. This preliminary study revealed that there exists a high occurrence of line-of-sight between "known" Gallina tower locations. Utilization of alliance activities by the prehistoric Gallina population indicates a level of social networking transcending that which has been traditionally suggested by archaeologists.

*Small, David (Lehigh)*

[06] CONTEXTS OF INTERACTION AND STRUCTURAL MARXIST APPROACHES IN ARCHAEOLOGY

Structural Marxist approaches in archaeology are becoming quite popular. These approaches often center around a concept of two levels of social structure, the top, often ideological, and the under or social reality. But what is often referred to as the social reality is actually isolated in a specific context of interaction. A common social reality did not exist. Examples from the early Mediterranean indicate that a more productive analysis would concentrate on the relationship of the contexts themselves rather than on ambiguous notions of universal top and under structure.

*Smiley, Francis E. (Southern Illinois-Carbondale) and William J. Parry (CUNY-Hunter)*

[05] EARLY, INTENSIVE, AND RAPID: RETHINKING THE AGRICULTURAL TRANSITION IN THE NORTHERN SOUTHWEST

For nearly a century archaeologists have grappled with, but have shed little light on, the chronometry of early agriculture in the northern Southwest. This conspicuous void has been a major stumbling

block in the application and evaluation of models of agricultural transition, particularly since these Kayenta/Grand Gulch region sites have produced some of the most complete assemblages of the remains of early agricultural societies known. We present, in this paper, a mass of new radiocarbon evidence and evaluate current models of early agriculture in the light of the fact that farming arrived at least a millennium earlier, was far more intensive, and spread much more rapidly than previously supposed.

*Smith, F. (see Friedman, I.) [33]*

*Smith, Jack (National Park Service)*

[30] IMPACTS OF WILDFIRE ON ARCHAEOLOGICAL SITES AT MESA VERDE

In July, 1989, a wildfire burned over nearly 3000 acres of Mesa Verde National Park. The burned area included approximately 200 archaeological sites. The impact of the fire on the cultural resources were assessed in a resurvey of the area. The observed evidence of fire damage varies with the intensity of the fire and this varies with the nature of vegetation consumed. There are clear patterns of damage ranging from slight to severe. The relationship of variations in fire intensity to adverse impacts on cultural resources in this area will be discussed in terms of the applicability of our observations to planning for management of both wildland and prescribed fires.

*Smith, Michael E. (Loyola)*

[64] MATERIAL EXPRESSIONS OF WEALTH AND STATUS AT LATE POSTCLASSIC SITES IN MORELOS, MEXICO

This paper analyzes domestic contexts at the Late Postclassic sites of Cuexcomate and Capilco in Morelos, Mexico. Two domains of variation—the energetic and the visual—are considered in relation to residential architecture and domestic artifacts. Elite residences are far more "costly" and visually distinct than common houses, and while no domestic artifact classes are exclusively linked to the elite, high-status households clearly had greater access to imported goods and status-communicating serving ware. These results are consistent with both materialist/energetic models of wealth and communication/information models of status, and indicate the value of both approaches to the study of ancient patterns of social stratification.

*Smith, Michael E. (Loyola) [Discussant 50]*

*Smith, Philip E.L. (Montreal)*

[81] GHAR-I-KHAR AND SOME NEARBY SITES IN IRAN

Ghar-i-Khar is a long and apparently deep cave in the central Zagros near Bisitun. Tested by the author in 1965, it revealed more than 5m of deposits. The stratigraphic sequence is Mousterian, Baradostian, Zarzian, Neolithic, and Historic. Animal bones and charcoal are well preserved. The small sample of materials recovered is informative, particularly in the context of the nearby sealed sites of Warwasi (with the same Paleolithic sequence) and Hunter's Cave. Several other possible Middle Paleolithic (surface) sites in this area were found in 1977.

*Smyth, Michael P. (New Mexico)*

[36] RECONSTRUCTING THE PAST BY REFERENCE TO THE PRESENT: THE SOCIAL IMPLICATIONS OF HOUSEHOLD ACTIVITY ORGANIZATION AT SAYIL, YUCATAN, MEXICO

Archaeological investigations at the Terminal Classic (A.D. 800–1000) Maya center of Sayil and ethnoarchaeological research at the Puuc hills region have begun to reveal the organization of past households activities. Modern Maya household data provides information needed to infer important aspects of social organization as they relate to past and present residential activities. These diverse lines of information not only allow archaeological determination of what and where activities occurred but socially reflects those individuals that performed them. The spatial organization of domestic activities at a residential platform at Sayil is used to facilitate social reconstruction of past Maya family structure, division of labor, and household population size.

*Sobolik, Kristin D., D. Gentry Steele and Vaughn M. Bryant, Jr. (Texas A&M)*

[28] DIETARY ANALYSIS OF THE ARCHAIC FORAGERS OF SOUTHERN NORTH AMERICA

The desert regions and their peripheries of northern Mexico and southwestern United States have one of the longest histories of foraging populations of any place in the Americas. The Archaic populations of this area are typically recognized by the stability of their subsistence bases, and their long occupation of the semi-desert core regions. This paper will focus on the diet of these Archaic populations. The dietary analysis will include a synthesis of the faunal, floral, and coprolitic research which has been conducted in the area. This research will be used to determine the base necessities

for cultural stability, possible causes for cultural change through time, and the origin for cultural transition in surrounding areas.

*Solecki, Ralph S. and Rose Solecki (Columbia)*

[81] THE POINTED ARTIFACTS IN THE MOUSTERIAN ASSEMBLAGE (LAYER D) FROM SHANIDAR CAVE

Shanidar Cave in northern Iraq contains a sequence of deposits to a depth of nearly 14m, of which the Middle Paleolithic horizon is the thickest and most important. The lithic industry is Zagros Mousterian. Midway in the Mousterian deposits is a short lived facies in which bulbular thinning at the butt end is a distinctive technological technique. Also of note are the numerous hearths, both communal and family size. A number of these are located next to stone blocks, affording radiant heat to the cave occupants.

*Solecki, R. S. (see Farrand, W.) [55]*

*Solecki, R. (see Solecki, R. S.) [81]*

*Spaulding, W. Geoffrey (Quaternary Research Center-Washington)*

[28] PALEOECOLOGY OF SOUTHWESTERN NORTH AMERICA: THE LAST 15,000 YEARS

During the Wisconsin Glacial Age floristic elements with affinities to present Great Basin steppe occurred as far south as Michoacan, and southwest to at least the northern Chihuahuan Desert. Complex readjustments of plant species' ranges occurred at the end of the last glacial age, between ca. 12,000 and 8,000 yr BP. The few paleoecological records conducted suggest aridity greater than that of the present between ca. 7,500 and 5,500 yr BP. Subsequent increase in the mesophytic character of vegetation throughout the region reached a climax between 2,000 and 1500 yr BP. The final phase of modernization of southwestern ecosystems occurred over the last ca. 1000 years, with a modest but notable decline in the importance of mesophytic plant species.

*Spence, Michael (Western Ontario)*

[02] RECENT EXCAVATIONS IN THE OAXACA BARRIO OF TEOTIHUACAN

Two seasons of excavation have been completed in a residential structure on the west edge of Teotihuacan. The evidence recovered establishes that the occupants were Zapotecs who had emigrated from the Valley of Oaxaca to Teotihuacan in the Tlamimilolpa phase (200–450AD). Through some four or five centuries in Teotihuacan they retained a distinctive ethnic identity, reflected in the persistence of Zapotec ceramic types (locally produced), ritual practices and architectural forms. Four sequentially used tombs of Zapotec style were found. Possible explanations for this persistent ethnicity will be discussed.

*Speth, John D. (Michigan) and Mark F. Baumler (Montana Historical Society)*

[81] A MIDDLE PALEOLITHIC ASSEMBLAGE FROM KUNJI CAVE, IRAN

Excavations by one of the authors (JDS) at Kunji Cave (Luristan, Iran) in 1969 yielded a relatively unbiased and diverse assemblage of Middle Paleolithic chipped stone artifacts comprising over 2000 pieces. In this paper, the authors describe and examine this important assemblage from the perspective of lithic reduction and technology. Specifically, we address questions of the manner and method of core reduction, the selection and treatment of retouched pieces, and the implications that these facets and the overall makeup of the assemblage have for the interpretation of the Middle Paleolithic occupation of Kunji Cave and the Zagros Mousterian in general.

*Spoerl, P. M. (see Cartledge, T. R.) [52]*

*Stanfill, Alan (Advisory Council on Historic Preservation)*

[78] THE LOGISTICS OF PREPARING RESEARCH DESIGNS

Research designs reviewed by the Advisory Council on Historic Preservation focus on a variety of questions and approaches. Many research designs, however, are unacceptable for purposes of Section 106. Council objections to inadequate research designs lead to delays that can be avoided through careful planning and communication. Factors which should be considered in the development of research designs are relevance, logistical consistency, specificity and efficiency. Effective communication of these factors is essential for planning archaeological investigations and for completing the Section 106 process.

*Stannard, David (Hawaii-Manoa)*

[48] THE CONSEQUENCES OF CONTACT: TOWARDS A THEORY OF INDIGENOUS RESPONSES TO BIOLOGICAL AND CULTURAL INVASION

The devastating impact for many of the world's indigenous peoples of initial contact with the West has been studied from a number of independent perspectives—epidemiological, anthropological,

political, psychological, and more. This paper argues that it is time to begin serious discussion of an overarching, interdisciplinary, theoretical approach to the subject. Using the Hawaiian islands as a model, this paper builds its analysis around the framework of microparasitism and macroparasitism that William H. McNeill has suggested as a fruitful way of looking at the evolution of human society. This fusion of the biological and the cultural, it is argued, is essential to an understanding of the consequences of contact.

*Stark, Barbara L. (Arizona State) [Discussant 64]*

*Stark, Ken (Hawaii)*

[06] WEALTH CONTROL AND SOCIOPOLITICAL CHANGE IN PREHISTORIC JAPAN

Wealth, exchange and political power are important features in the study of the evolution of social complexity. In prehistoric Japan, competition over wealth control was a factor in the development of Yayoi period society. Variation in the distribution of bronze burial objects, from Yayoi period cemeteries on the island of Kyushu, documents change in pattern of exchange and wealth distributions. Regions in Kyushu with highly developed wealth exchange networks experienced the greatest political upheaval. These results suggest that political competition in some complex societies may inhibit further evolutionary development.

*Stark, M. (see Aronson, M.) [22]*

*Startin, Bill (English Heritage)*

[66] ENGLISH HERITAGE RECORDS FOR CULTURAL RESOURCE MANAGEMENT

English Heritage advises government on the protection and preservation of ancient monuments and historic buildings in England. It uses and holds records to serve these functions. A "Monuments Protection Programme" is being undertaken to review the current knowledge of archaeological sites, to update the schedule of protected ones and to access the requirements for positive management. The review is based on national and local record systems. Following field visits, these will receive for their own information and planning needs the new records made for protected sites, and the subsequent reports by English Heritage Field Monument Wardens on their site management.

*Stearns, C. H. (see Farrand, W.) [55]*

*Steele, D. Gentry and Joseph F. Powell (Texas A&M)*

[28] AN OSTEOLOGICAL EXAMINATION OF PREHISTORIC HUNTERS AND GATHERERS OF THE SOUTHERN DESERT AND SEMI DESERT REGIONS OF NORTH AMERICA

The earliest known remains of human populations occupying the southern deserts and peripheral areas of North America include three specimens older than 8,500 years, scattered samples of approximately 30 humans between 3,000 and 8,500 years, and a significantly larger sample of remains less than 3,000 years. Most of these Archaic and Late Prehistoric skeletal remains have been recovered from the Trans-Pecos, Lower Pecos and eastern margin of the Tamaulipan biotic province in Texas. Structurally, these samples indicate the desert populations were small and gracile peoples with relatively long heads. The few dental descriptions present indicate a pattern characteristic of other North American populations. Examination of an early Archaic assemblage from the Chihuahuan Desert indicates that some of these peoples at least were healthy and well adapted to their environment.

*Steele, D. G. (see Sobolik, K. D.) [28]*

*Stein, Gil (NYU and Smithsonian)*

[47] "DON'T GET AROUND MUCH ANYMORE": EFFECTS OF SEDENTISM ON NEOLITHIC ANIMAL ECONOMY IN THE NEAR EAST

Faunal remains from the Neolithic (seventh Millennium BC) village of Gritille, Turkey, are used to formulate a model in which sedentism and risk aversion help account for the shift from hunting to herding economy. I suggest that the development of sedentary agriculture during the eighth millennium caused scheduling conflicts with the hunting cycle, while creating new configurations of seasonal uncertainty in subsistence. Gritille villagers apparently adapted to these constraints by abandoning the summer hunt and shifting winter hunting to a "least effort" strategy emphasizing seasonally available game in the Euphrates Valley. Implications of these changes for animal domestication are discussed.

*Stein, John R. (Bureau of Indian Affairs) and Stephen H. Lekson (Arizona State Museum)*

[17] ANASAZI RITUAL LANDSCAPES

Pueblo Bonito, as the largest of the great pueblos of Chaco Canyon, has traditionally been viewed as the archetypical great house and the symbol of the architectural phenomenon which is "Chaco". An examination of Anasazi ritual landscape logically begins with Pueblo Bonito and the "built

environment" as it was manifest in Chaco Canyon in the mid 12th century A.D.. From this perspective we will compare and contrast the architectural developments at Chaco Canyon with distant but contemporary ritual landscapes.

*Stein, J. R. (see Fowler, A. P.) [17]*

*Stein, Julie K. (Washington)*

**[46] THE CONTEXT OF ARTIFACTS: ARCHAEOLOGY, GEOARCHAEOLOGY, OR GEOLOGY**

For archaeologists, interpretation of an artifact's context is a reconstruction of its original position and events since abandonment. Reconstructions are focused on the object. Geologists focus analysis on deposits rather than on individual objects. Associations and descriptions are used to reconstruct what happened to the deposit since it was laid down, but the associations are used to reconstruct a collective history of all the objects in the deposit. Although artifacts were manufactured and used, and those additional interpretations are of interest, to interpret what happened to an artifact since its abandonment requires considering it as part of a geological deposit.

*Stein, Julie K. (Washington) [Discussant 30]*

*Stevenson, Christopher Moore (Archaeological, Historical Consultants) and James J. Mazer and John K. Bates (Argonne National Laboratory)*

**[33] THE EFFECT OF RELATIVE HUMIDITY ON THE RATE OF HYDRATION:**

**IMPLICATIONS FOR OBSIDIAN HYDRATION DATING**

Since the development of the obsidian dating method it has been assumed that the rate of hydration is not dependent upon environmental relative humidity. Recent laboratory experimentation has documented a pronounced dependency of the hydration rate on environmental relative humidity. Monoliths of three obsidians have been reacted at 60, 90, and 100% relative humidities at temperatures between 160 C and 180 C for durations up to 26 days. Optical measurement of the induced rims was completed. The effect of relative humidity as a function of obsidian composition and reaction temperature will be presented. Implications for the dating of archaeological contexts are to be discussed.

*Stevenson, C. M. (see Scheetz, B. E.) [33]*

*Stevenson, Marc G. (Alberta) [Discussant 82]*

*Stewart, Kathryn (Toronto)*

**[86] FISHING ADAPTATIONS AND ENVIRONMENTAL CHANGE AT HOLOCENE LAKE TURKANA SITES**

Archaeological sites with associated barbed bone points, lithics, pottery, and abundant fish remains emerge concomitant with the Holocene high lake level period at Lake Turkana. Analysis of the faunal and cultural assemblages within the context of a model on resource availability demonstrates variation in response to lake level change. Sites in the early lake level period reflect a mixture of hunting and fishing, with fish selectively being of easy-to-procure taxa. Subsequent to lowered lake levels, the sites show a greater subsistence reliance on fish and a greater diversity of taxa, reflecting more familiarity with fish and lake ecology. Changes in the material culture assemblages reflect new procurement and processing techniques, and suggest a more sedentary mode of living.

*Stodder, Ann L.W. (Colorado-Boulder)*

**[11] PALEOEPIDEMIOLOGY OF EASTERN AND WESTERN PUEBLO COMMUNITIES IN EARLY CONTACT PERIOD NEW MEXICO**

Human skeletal populations from the Zuni site Hawikuh and San Cristobal Pueblo in the Galisteo Basin provide information on the health and demographic status of the Pueblos during the era of initial Spanish contact and colonization, prior to the Pueblo Revolt of 1680. Compared to earlier (and smaller) Pueblo populations Hawikuh and San Cristobal exhibit high rates of traumatic injury and increased infectious disease loads. Striking differences in specific patterns of physiological stress are also evident between these two contemporaneous populations. These differences are interpreted in the context of community ecology and local and regional events in the 16th and 17th centuries.

*Stoltman, James B. (Wisconsin-Madison)*

**[22] PETROGRAPHIC THIN SECTION ANALYSIS AS A TOOL FOR DOCUMENTING CULTURAL INTERACTION: AN EXAMPLE FROM THE UPPER MISSISSIPPI VALLEY**

The petrographic identification of ceramic tempers has long been known to be a fruitful line of inquiry for investigating inter-site and inter-regional cultural interaction. By applying point counting procedures to the recording of natural as well as humanly-added mineral inclusions in ceramic thin sections, considerable power can be added to this traditionally qualitative technique. The effectiveness

of this more quantitative approach in discriminating local from non-local vessels is demonstrated through a comparative analysis of two Middle Mississippian-contact sites in the Upper Mississippi Valley, Hartley Fort in NE Iowa and Fred Edwards in SW Wisconsin.

*Stone, Glenn Davis (Columbia)*

**[82] CULTURAL AND ECOLOGICAL DETERMINANTS OF FARMSITE ABANDONMENT**

Faced with declining yields from continual cultivation, farmers must choose between agricultural intensification and abandonment. Agrarian cultures may vary in their propensity to abandon settlements, even under the same ecological and economic conditions. Basic patterns of abandonment and intensification, and their entailments, are outlined. This contrast is illustrated by an ethnoarchaeological study of two groups following the abandonment and intensification routes in the same setting in the Nigerian savanna. A second case study comes from the history of abandonment patterns among European pioneers in the American Eastern Woodlands.

*Stone, G. D. (see Holzhall, V.) [20]*

*Stoops Jr., Richard W. (Tennessee)*

**[61] DETERMINING THE EFFECTS OF HUMAN TRAMPLING ON THE LATERAL MOVEMENT OF SURFACE ARTIFACTS**

An often cited but little understood archaeological disturbance process is the effect of site occupants walking across the surface. Experiments were conducted that identified some of the variables that influence the response of surface artifacts to foot traffic. These variables (trampling pattern, artifact distribution, artifact size and trampling duration) were each determined to have a significant impact on the movement of surface items. A model of artifact displacement as a function of trampling disturbance was generated based on these significant factors. This model, while accounting for only some of the relevant variables, serves as a solid baseline for further research.

*Sugiyama, S. (see Cowgill, G. L.) [51]*

*Sullivan, III, Alan P. (Cincinnati)*

**[74] A REEXAMINATION OF ANASAZI SUBSISTENCE CHANGE**

Southwestern archaeologists have inferred substantial differences through time and across space in prehistoric subsistence. These differences often have been attributed to economic variation (e.g., the relative contributions of farming and foraging to the diet). Few models, however, have explored alternative sources of archaeobotanical assemblage content—the basic data of paleoeconomic reconstruction. Using the results of analyses from sites in the Grand Canyon and southwest Plateau area, models of Western Anasazi subsistence change are reexamined to determine whether archaeobotanical evidence advanced to support them reflects paleoeconomic change or merely context (i.e., sample-dependent) variation.

*Sullivan, III, A. P. (see Berger, K.) [14]*

*Sullivan, Lynne P., Lisa M. Anderson and Edward V. Curtin (New York State Museum)*

**[61] ACCESS TO THE PAST: THE NEW YORK STATE MUSEUM'S ARCHAEOLOGICAL COLLECTIONS MANAGEMENT PROJECT**

Introduction of computers to museum collections management has revolutionized access to an increasingly valuable archaeological resource. A collections management system in development at the New York State Museum illustrates the potential for museum staff to dramatically increase access to archaeological information with only a desktop computer and a commercial database program (dBase III plus). Several levels of data files allow numerous combinations of informational searches of archaeological data collected over 150 years in New York State. Information about ca. 1,000,000 specimens and associated documentation is easily retrievable in various formats and new types of data can readily be added to the system for expanding research needs.

*Sutton, Mark O. (California State-Bakersfield)*

**[07] KOEHN LAKE IN THE PREHISTORY OF THE SOUTHWESTERN GREAT BASIN**

Excavations in the vicinity of Koehn Lake have revealed two temporally distinct settlement/subsistence patterns, one oriented to the lake and the other to a more xeric environment. The desiccation of the lake may have been a factor in the movement of the Kawaiisu from the desert into the mountains and may have influenced larger scale population movements across the Great Basin.

*Swagerty, William R. (Idaho)*

**[48] PROTOHISTORIC TRADE IN WESTERN NORTH AMERICA: ARCHAEOLOGICAL AND ETHNOHISTORICAL CONSIDERATIONS**

Archaeologists and ethnohistorians have independently advanced our understanding of exchange systems during the North American Protohistoric. This study reviews definitions, models, and

approaches to the native trade of western North America and offers a new, interdisciplinary analytical and cartographic framework for the region.

*Tainter, Joseph A. (USFS)*

[65] UNRAVELING THE ORIGINS OF INEQUALITY

The origin of inequality is one of the fundamental problems of prehistory. Many recent studies have proposed or assumed that ranking is the result of intra-societal conflicts which emerge with economic differentiation. Such explanations are crippled by psychological or biological reductionism. This paper examines the assumptions of conflict models, and shows that such models cannot account for the origin of inequality.

*Takac, Paul R. (Southern Methodist)*

[54] "HOME BASES" AND THE PALEOINDIAN/ARCHAIC TRANSITION IN CENTRAL TEXAS

Excavations at Spring Lake, a stratified, spring-inundated site located along the Balcones Fault in Central Texas, have yielded well over 200 identifiable projectile point types. Ranging from Clovis and Plainview to Late Archaic "dart points", this material is particularly relevant for examining the Paleoindian/Archaic Transition. Spring Lake has been identified as a year-round Paleoindian "home base". This controversial hypothesis is evaluated in terms of the spatial patterning of excavated materials, local environments, and the availability of raw materials.

*Takaesu, Michael (California-Radiocarbon Laboratory) and Jonathon E. Ericson (UC-Irvine)*

[68] SEASON OF DEATH OF SHELLFISH DETERMINES FEATURE CONTEMPORANEITY AND MARINE PALEOTEMPERATURES BY OXYGEN ISOMETRY

The cyclic nature of ocean surface temperatures affects oxygen isotope ratios of growth rings of marine shellfish. The oxygen isometry data are used to establish the seasonality of features. These data are coupled with the radiocarbon paleotemperature record of the Pacific Ocean.

*Tani, Masakazu (Garbage Project-Arizona) and Gavin H. Archer (Garbage Project-Bureau of Applied Research)*

[60] DATING GARBAGE: THE ACCURACY AND THE UTILITY OF BOTTLE MARKS TO DATE SECONDARY REFUSE DEPOSITS

Dating is the most fundamental inference made in archaeology. Modern secondary refuse in landfills can be accurately dated using printed media, such as newspapers. However, when modern refuse becomes old refuse after many years, printed media is not available for dating. Using data derived from landfill excavations the accuracy and the range of variability of bottle dates are assessed against newspaper dates as a bench mark. Implications of the function and the use life of bottles for dating secondary refuse by bottle marks are discussed. Bottle dating also has relevance for the principle of ceramic dating of prehistoric refuse.

*Tankersley, Kenneth B. (Illinois State Museum)*

[74] BISON AND SUBSISTENCE CHANGE DURING THE LATE PREHISTORIC OF THE OHIO VALLEY

A significant decline in maize-based economies occurred in portions of the Ohio Valley during the latter part of the 15th century A.D. This economic change co-occurred with the eastward expansion of bison's secondary range. The biocultural stresses associated with a heavy dependency on amize agriculture may have been relieved by exploiting this new source of dietary protein. This paper views a late prehistoric shift from maize agriculture to a hunter-farmer subsistence strategy as one of both necessity and choice.

*Taube, Karl (UC-Riverside) and Tomas Gallareta (INAH/Tulane)*

[02] THE SAN ANGEL SURVEY PROJECT: A RECONNAISSANCE IN THE NORTHERN QUINTANA ROO SAVANNA SYSTEM

The paper summarizes the results of the 1988 survey conducted by the authors in the northeast corner of Quintana Roo, Mexico. The primary goal of the project was to record the mural paintings and standing architecture of two Late Postclassic plaza groups located in the vicinity of the town of San Angel. In addition, various previously unreported sites in the savanna were also investigated to obtain a broader archeological perspective of the area. The identification of the ceramic sherds collected suggests a sequence of occupation of the zone from the Late Preclassic to the Late Postclassic.

*Taylor, Sarah (Cambridge)*

[19] A CAST-IRON CASE OF DIFFUSION? INFLUENCES AND INNOVATION IN ANCIENT KOREAN IRON PRODUCTION

The origins of Korean iron production are generally imputed to diffusion from China. The dates, routes and means of diffusion are the subject of much debate, as is the role of the Chinese state of

Yen and the Lelang commandery. Nationalism and the unexamined use of the concepts of innovation and diffusion mar much of this debate, however. By a re-examination of these concepts, and of the specific nature of the organization and technology of iron production, I hope to shed fresh light on the interplay of outside influences and local innovation in the origins of Korean iron production.

*Tchernov, Eitan (Peabody Museum)*

[55] PALEOCLIMATIC INDICATORS IN THE LATE QUATERNARY FAUNA OF THE LEVANT

The updated information on the Levantine late Pleistocene mammalian assemblages enables us to trace the faunal turnover throughout the period, and correlate it with biotic and abiotic factors. The magnitude of the environmental changes were steep enough to affect the micromammalian communities, and the genetic construction of populations. It was not effective enough to cause an overall faunal turnover of large mammals; their extinction during the Holocene is mainly anthropogenic. Significant microfaunal changes are recorded from the early Mousterian [late stage 5], stage 4 [=Tabun D], scarcely during the later Mousterian, but more suggestive in the Upper Paleolithic and early Holocene.

*Terrell, John (Field Museum of Natural History) [Discussant 62]*

*Thacker, Paul (Southern Methodist) and Lawrence J. Jackson (Northeastern Archaeological Services)*

[40] HAROLD J. COOK AND JESSE FIGGINS: A NEW PERSPECTIVE ON THE FOLSOM DISCOVERY

The 1926 discovery of the Folsom site and its subsequent evaluation in North American archaeology is well-known. This paper explores the level of intentionality in the search for evidence of Late Pleistocene humans and the dynamic relationships of Harold J. Cook and Jesse Figgins which fueled this search. Although Figgins and particularly Cook are sometimes regarded as amateurs who happened upon fluted point sites, archival records reveal a lengthy paleontological field program, supported by the Colorado Museum of Natural History, which carefully watched for early human associations.

*Thomas, David Hurst and Lorann S.A. Pendleton (American Museum of Natural History)*

[42] HIGH ALTITUDE ARCHAEOLOGY AT ALTA TOQUIMA VILLAGE (NEVADA)

Alta Toquima is a large village with multiple dwellings located at an elevation of 3350 m (11,000 ft) on Mt. Jefferson (Monitor Valley, NV). We discuss our recent archaeological research at Alta Toquima and Mt. Jefferson. We compare and contrast the subsistence and settlement data from this high altitude complex with data recovered at nearby Gatecliff Shelter and elsewhere in Monitor Valley.

*Thomas, David Hurst (American Museum of Natural History)*

[23] MISSION REVIVAL ARCHITECTURE AS INSTANT ARCHAEOLOGY

Introduced to the world at the Columbian Exposition of 1893, California's Mission Revival style spawned hundreds of post offices, train stations, school and office buildings—each an idealized, romanticized Franciscan mission. We examine how such counterfeit archaeology mythologizes the past and colors the way in which California's mission period is today perceived. We also consider the contrasting case of Florida's invisible Spanish missions, which lacked the stimulus of bogus architectural resurrection.

*Thomas, Julian (Saint David's)*

[71] THE CHANGING MEANINGS OF FOOD IN NEOLITHIC BRITAIN

Archaeological studies which concern themselves with food and nutrition have tended to concentrate on 'universal', 'biological' aspects, presumably in the hope of grounding knowledge of the past in cross-cultural generalizations. Conversely, this paper will argue that we can learn more by attempting to historicise and relativize even the most basic aspects of human existence, and considering how they might change through time. The case study will concentrate on the use of food in domestic and ceremonial transactions in Neolithic Britain, as evidenced by ceramic and faunal remains.

*Thomas, Julian (Saint David's) [Discussant 31]*

*Thompson, L. (see Shimada, I.) [76]*

*Thoms, Alston V. (Washington State)*

[32] ROOT-FOODS AND HUNTER-GATHERER INTENSIFICATION: THE ROLE OF CAMAS IN THE PACIFIC NORTHWEST

Camas (*Camassia esculenta*), a lily with a nutritious bulb, was used regularly by about 7000 to 5500 yr B.P. Its use as a bulk-processed, overwintering staple probably developed about 4000 to 3500 yr

B.P. Ecological and ethnoarchaeological studies provide useful data on the expected nature of intensively used camas grounds and processing places. Archaeological camas processing camps are characterized by: (1) rock-filled earth ovens; (2) carbon-stained sediments and/or high densities of fire-cracked rocks; (3) low densities of chipped stone artifacts, mostly expedient tools; and (4) few, if any pestles, grinding stones, or other presumed root processing tools.

*Tilley, Chris (Saint David's)* [Discussant 31]

*Todd, Lawrence C., Michael Lawson and Kelly Klein (Zuni Archaeology Program)*

[08] LINEAR AND SMALL-SCALE SURVEY AS A REGIONAL PATTERN RECOGNITION STRATEGY

Collection of data from small-scale surveys such as fence lines and water tank locations often is conducted on a project-by-project basis with little concern for consolidation of the results within a broader research framework. In an effort to create an integrated research program using such data from the Navajo-Hopi Indian Relocation Commission New Lands project in eastern Arizona, several survey and documentation methodologies have been evaluated. These methodologies emphasize the suitability of partitioning small-scale surveys into comparable analytic units that can be incorporated into regional pattern recognition studies.

*Todd, L. C. (see Anyon, R.)* [08]

*Toll, H. Wolcott and Eric Blinman (Museum of New Mexico)*

[17] CHACO IN THE CONTEXT OF CERAMIC REGIONAL SYSTEMS

It has been common practice to verify architecturally based notions of the Chaco system using selected ceramic traits attributed to Chaco rather than by independently defining regional systems and then comparing the whole with roads and architecture. Understanding the similarities in ceramic assemblages across the Anasazi area would shed considerable light on the place of Chaco in the cultural development of the area. Were ceramic regional systems derivative of a Chacoan system, or were the manifestations of the Chacoan system simply overlays on more enduring patterns of Anasazi interaction?

*Toll, H. W. (see McKenna, P. J.)* [17]

*Tomka, Steve A. (Texas)*

[82] SITE ABANDONMENT BEHAVIOR AMONG TRANSHUMAN AGRO-PASTORALISTS: IMPLICATIONS FOR THE RECONSTRUCTION OF SITE USE AND FUNCTION

Ethnoarchaeological fieldwork among transhumant agro-pastoralists in SW Bolivia defined three types of household abandonment: seasonal, intermittent, and permanent. Three segments form the community settlement pattern: the pastoral, agricultural, and main village. The recycling of household assemblages following abandonment alters their pre-abandonment size, composition, and associational integrity. This paper discusses the effects of recycling on reconstruction of segment use and function. In addition, it explores the factors conditioning the recycling of different artifact classes to define the expected post-abandonment skewness in assemblage composition under the three abandonment types.

*Toom, Dennis L. (Colorado-Boulder)*

[20] THE BEST OF BOTH WORLDS: HISTORIC, ECONOMIC, AND CLIMATIC FACTORS RELATED TO EARLY VILLAGE FORMATION IN THE MIDDLE MISSOURI SUBAREA OF THE PLAINS

The Northern Plains of North America were dominated by nomadic hunter-gatherers for 11,000 years until ca. A.D. 1000 when sedentary peoples of the Middle Missouri tradition (Plains Village pattern) began to occupy the Middle Missouri subarea. These early village dwellers had dual subsistence economies based on (1) simple agriculture and (2) hunting and gathering. The development of the Middle Missouri tradition is complex and related to a combination of factors, including a prior history of village life in the east, the lure of bison with the potential to still practice agriculture, and an improved local climate that facilitated the adaptive process.

*Tosi, Maurizio (Instituto Italiano per il Medio Ed Estremo Oriente-Roma)*

[70] SECTORIAL GROWTH AND CRAFT SPECIALIZATION: TWO PERSPECTIVES TO INTERPRET SOCIAL EVOLUTION FROM THE ARCHAEOLOGICAL EVIDENCE

Craft specialization is elusive across the archaeological record. Since quantitative evaluations are mostly derived by combining intrasite density variance of indicators with number of manufacturing processes, complexity becomes an aspect of sectorial growth, i.e., increasing number of production processes and an increasing number of manufacturing stages. The distribution of tools, debris and products can be evaluated to establish the degree of spatial (horizontal) and processual (vertical)

disaggregation in each manufacture. While directly significant to the dynamics of industrial activity, these data are not related to relations of production. In historical perspective craft specialization is devised as a social strategy to consolidate relations of inequality. For their widespread availability, lithic tools become the best class of objects to establish physical organization of the industrial sector for cross-cultural perspectives.

*Tourtellot, Gair (Northwestern)* [Discussant 36]

*Towner, Ronald (Arizona)*

[47] ALTERNATE FACE THINNING AND THE PRODUCTION OF "SOFT HAMMER" PERCUSSION FLAKES

The identification of "soft hammer" percussion flakes in archaeological assemblages has been debated for over two decades. Experimental studies have documented attributes characteristic of soft hammer percussion. However, the technique of bifacial thinning has not been considered in previous studies. This experiment compares two different bifacial thinning techniques and indicates that thinning technique plays an important role in the formation of "soft hammer" percussion flake attributes.

*Townsend, Richard (The Art Institute of Chicago)*

[64] THE SACRED PRECINCTS OF MOUNT TLALOC

Mount Tlaloc, overlooking the Valley of Mexico, the Puebla basin and the peaks of Ixtaccihuatl and Popocatepetl, was the location of an annual royal pilgrimage by the kings of Tenochtitlan, Texcoco, Tlacopan and Xochimilco in a great ritual to Tlaloc, divinity of rain. In order to help explain the symbolism and chronological aspects of the religious precinct, a 1989 U.S.-Mexican expedition mapped the site and gathered surface collections. The enclosure is revealed to have been a temple to the Earth Mother as well as a rain cult shrine; the Aztec kings are shown to have been enacting an ancient cosmogonic myth.

*Trejo A., E. C. (see Witschey, W. R.)* [12]

*Tremaine, Kim (Sonoma State)*

[33] THE COMPLEXITIES OF GLASS SURFACE REACTIONS AND IMPLICATIONS FOR OBSIDIAN DATING

Glass scientists have made considerable advances recently in their understanding of glass surface reactions, increasingly documenting the complexity of glass weathering processes. Many factors, working synergistically, have been shown to affect both mechanisms and rates of weathering. In this paper, literature pertaining to glass weathering models and the effects of such factors as solution pH, solution composition, glass surface-area-to-solution volume, relative humidity, and temperature, are reviewed. Implications regarding the dating of obsidian are then explored. Several problems are identified and future research directions suggested.

*Tremblour, F. (see Friedman, I.)* [33]

*Trinkaus, Kathryn (Maxwell Museum)*

[06] SAMPLE COMPARABILITY AND ASSEMBLAGE STRUCTURE AS INFERRENTIAL TOOLS

Appearance of ditched camps, a major settlement of terminal neolithic western Europe, has been variously related to increasing social differentiation. However, these sites comprise complex, crosscutting building phases, giving samples of widely differing size and making difficult comparison of assemblage structure across time. Measures of richness and evenness, compared with expected values under three hypotheses of site use and duration, assess comparability of samples as these hypotheses are tested. Results of lithic analysis indicate that scope of activity can be addressed with such samples, whereas extra-regional procurement cannot. The consistent, broad-scale pattern of activity seen in the Charente drainage of western France differs significantly from the intermittent, possibly ceremonial use postulated for some sites in northern France and southern England.

*Turner, C. L. (see Pak, N.)* [84]

*Tykot, R. (see Gallin, L.)* [06]

*Urban, Patricia A. and Edward M. Schortman (Kenyon)*

[36] LATE CLASSIC ACTIVITY DISTRIBUTION AND SOCIAL ORGANIZATION AT THE SITE LEVEL IN TWO REGIONS OF SOUTHEASTERN MESOAMERICA

Recent investigations in the Central Santa Barbara and Naco Valley regions of western Honduras have provided information on the organization of activities and space within Late Classic household groups. This paper focuses on the most thoroughly excavated of these units, Site 106 in Santa Barbara, and discusses patterns of artifact and architectural variation among exposed buildings in order to determine the distribution of ancient behaviors. Comparisons with contemporaneous Naco settle-

ments help test the generality of these organizational patterns. The implications of this study for reconstructing population size, social organization, and trajectories of site growth are considered.

*Urunuela, G. (see Plunket, P.)* [02]

*Vadem, K. (see Scheetz, B. E.)* [33]

*Valdez, Jr., Fred (Texas-Austin), Kathryn V. Reese (Texas Archaeological Research Laboratory) and Douglas B. Bamforth (Nebraska)*

**[27] ETHICAL ARCHAEOLOGY AND ARCHAEOLOGICAL ETHICS**

Most archaeologists practice archaeology in accordance with their own moral or ethical standards, which affect interpretations of disciplinary standards and which may also differ in some areas from those of archaeology as a whole. This paper considers the interaction between individual and disciplinary ethics, and particularly attempts to specify the latter. We emphasize two aspects of disciplinary ethics—the effects of our actions, first, on the research of modern and future archaeologists, and, second, on non-archaeologists who share our interest in past human ways of life—and argue that preservation efforts and public outreach are mandatory for all practicing archaeologists.

*Valdez, F. (see Scott, IV, R. F.)* [74]

*van Hartesveldt, Eric and Kurt Dongske (Navajo Nation Archaeology Department)*

**[08] PREHISTORIC SETTLEMENT PATTERNS ALONG THE RIO PUERCO OF THE WEST: THE MESHING OF CRM SURVEY RESULTS WITH REGIONAL RESEARCH QUESTIONS**

The "New Lands" incorporate about 149,739 ha (1497 km<sup>2</sup>) adjacent to the Rio Puerco of the west and east of the Painted Desert. Between April 1987 and August 1989, the Navajo Nation Archaeology Department surveyed approximately 25.9 km<sup>2</sup> of non-contiguous land within this area and located over 300 prehistoric sites. CRM goals and regional research questions are meshed by site recording methods. Preliminary observations indicate that most sites have Pueblo II-mid Pueblo III occupations; earlier occupations are less well represented, but may be masked by pre-Pueblo II depositional events.

*Vargas, P. (see Damp, J.)* [09]

*Varien, Mark D. (Crow Canyon Archaeological Center)*

**[33] METHODOLOGICAL ISSUES IN ASSESSING SITE USE-LIFE AND OCCUPATIONAL CONTINUITY IN THE AMERICAN SOUTHWEST**

Assessment of population size and the degree of mobility and sedentism among Formative horticulturalists in the American Southwest requires accurate estimation of site use-life and continuity of occupation. This paper reviews methods of estimating site use life and continuity of occupation using data from architecture, artifact and feature assemblages, dendrochronology, and stratigraphy. These techniques are illustrated with examples drawn from recent work by the Crow Canyon Archaeological Center and other projects in the Anasazi region.

*Varien, M. D. (see Wilshusen, R. H.)* [20]

*Verano, John (Smithsonian)*

**[77] HUMAN SKELETAL REMAINS FROM PIKILLA**

A small sample of human skeletal remains has been recovered from archaeological excavations at Pikillacta. The remains were recovered from both primary and secondary deposits. This paper examines the Pikillacta sample within the context of current knowledge of the physical characteristics and skeletal biology of Middle Horizon populations.

*Vierra, B. J. (see Hogan, P.)* [05]

*Vogt, Evon (Harvard)* [Discussant 71]

*von Falkenhausen, Lothar A. (Stanford)*

**[19] THE STATE OF YAN AND ITS NORTHEASTERN CONNECTIONS**

On the basis of archaeological finds, various forms of cultural contact between the Chinese state of Yan and its neighbors in the Chinese Northeast and on the Korean peninsula are characterized. The objective of the enquiry is to assess the extent of a possible Yan role in producing the initial developments towards greater socio-political complexity in the latter areas between ca. 500 and 200 B.C.

*Voorhies, Barbara and George H. Michaels (UC-Santa Barbara)*

**[02] THE CHANTUTO PEOPLE REVISITED: NEW RESEARCH ON THE LATE ARCHAIC PERIOD OF COASTAL CHIAPAS, MEXICO**

Our recent research on the Chantuto shell midden sites of coastal Chiapas has led us to formulate a model of subsistence and settlement that may apply more widely in the Mesoamerican coastal

lowlands for contemporary peoples of the late Archaic Period (ca 3000–2000 B.C.). We present the evidence in support of our interpretation that these middens were specialized procurement stations that were occupied periodically and perhaps seasonally. This finding suggest to us that the people responsible for the accumulation of these huge middens may have had semipermanent campsites at inland locations that have not yet been discovered. Studies from other coastal locations are compatible with this model but the scarcity of information about coastal peoples in the late Archaic Period precludes rigorous model testing. We will review the relevant research and consider possible alternative explanatory models.

*Waldbauer, R. C. (see McAllister, M.)* [13]

*Walker, James B. (The Archaeological Conservancy)*

**[37] THE INNOVATIVE MANAGEMENT OF PRIVATELY OWNED ARCHAEOLOGICAL PRESERVES**

Preserving and managing archaeological sites on private land poses special problems and offer unique opportunities for innovation. As development pressures increase in areas where sites are prolific, the challenge facing the preservation planner is to preserve sites without hindering development. That challenge can often be met by designating sites as open space. Sites can also be preserved within golf courses and recreational areas. Protection and a management of private preserves can become a community issue involving individual volunteers as well as home owner's associations. This paper addresses the management and protection needs of privately held archaeological preserves and explores innovative preservation solutions.

*Wallace, W. J. (see West, G. J.)* [07]

*Wandsnider, LuAnn (Center for Archaeological Investigations)*

**[72] PAST NOT-!KUNG AND NOT-NUNAMIUT BEHAVIOR IN SOUTHWESTERN WYOMING**

The character of past land use in southwestern Wyoming is examined using analyses of both the spatial arrangement of artifacts and assemblage content. These analyses yield diagnoses about the frequency and duration of place use as well as inferences about intentionality with which certain areas, such as those near water or in dune sand deposits, were visited. This characterization, rendered in terms of the tempo of place use, is found to depart from the current understanding of past use of the region, which is based upon models of !kung and Nunamiut behavior.

*Wandsnider, LuAnn (Center for Archaeological Investigations)* [Discussant 30]

*Warburton, Miranda (Navajo Nation Archaeology Department)*

**[08] ARCHAEOLOGICAL RESEARCH AT THE NAVAJO SPRINGS GREAT HOUSE**

Preliminary archaeological fieldwork (survey, mapping, recording, and in-field analysis) at the Navajo Springs Great House and surrounding environs has revealed a wealth of archaeological resources. Within a 160 acre area surrounding Navajo Springs, 18 apparently contemporaneous and related archaeological sites were located and recorded. The sociopolitical organization of this community reflected in the architecture and material culture is the focus of the present research. It is anticipated that this research will contribute to and benefit from the complementary cultural resource management projects undertaken by the Navajo Nation and the Zuni Archaeology Program in adjoining areas.

*Warren, R. E. (see Ferguson, J.)* [69]

*Watson, D. R. (see Bleed, P.)* [11]

*Watson, Patty Jo (Washington-St. Louis)* [Discussant 46]

*Wattenmaker, Patricia (Smithsonian)*

**[06] STATUS AND SUBSISTENCE IN PRE-STATE AND EARLY STATE SOCIETY**

The transition from chiefdom to state during the 3rd and 4th millennia BC in Southeast Turkey was accompanied by changes in organization of subsistence production and patterns of consumption. Spatial analysis of animal bones and agricultural tools from Kurban Hoyuk indicates that, as states developed in the region, subsistence production became specialized on the non-elite household level. Results of this study of subsistence artifacts are combined with evidence for changes in regional settlement patterns and craft production, as well as epigraphic data, to examine relationships among political control, tributary economy, and subsistence production. The emergence of specialized subsistence economy is linked to changes in political and economic ties between centers and satellite communities, and to changes in relationships between social classes in early complex societies.

*Weeks, John M. (Minnesota) and Nancy Black (SUNY-Albany)*

[01] MERCEDARIAN MISSIONARIES AND THE TRANSFORMATION OF LENCA INDIAN SOCIETY, WESTERN HONDURAS, 1550–1700

The penetration of regular clergy into northern Central America following the military campaigns of the 16th century resulted in the evangelization of indigenous chiefdoms and relegation of the Indians to the status of vassals of the Spanish Crown. The missionary church sought to eradicate paganism through an ideology of European domination. The Lenca Indians of western Honduras, assigned to the Mercedarian friars for spiritual conquest, were not passive recipients of European culture. This paper summarizes recent archaeological fieldwork and historical research concerning the motivation, efforts, and results achieved by the Mercedarian missionaries and the responses offered by the Lenca Indians.

*Weisler, Marshall (UC-Berkeley)*

[84] NON-IRRIGATED AGRICULTURE IN THE HAWAIIAN ISLANDS: RESULTS FROM AN ISLAND-WIDE SYNTHESIS

Most analytical attention of non-irrigated agriculture in the Hawaiian Islands has focussed on the major field systems on west Hawai'i Island. However, no island-wide synthesis of this production system has been advanced for an entire island. Using regional data collected from the island of Molokai', this paper documents the range of variability of non-irrigated agriculture and the relationship of ecological variables to agricultural features and sites. Intensification of production is inferred from demonstrating a change from shifting cultivation to permanent field features and agricultural expansion into marginal lands. The role of agricultural production in the island-wide polity is considered.

*Weismantel, M.J. (Occidental)*

[71] JAYAJ AND MISHQUI: INDIGENOUS FOOD CATEGORIES AND THE DIALECTICS OF GENDER IN THE NORTHERN ANDES

Two food categories used by Quichua-speaking inhabitants of a rural parish of the Ecuadorian Andes superficially refer to taste (sweet and hot), but their meanings also are created by the economic strategies involved in acquiring or producing the foods they describe; since the household deploys individuals into productive activities according to gender, these terms also have strong gender connotations. The relationship between these aspects of meaning: sensory experience, social structure, and economic strategies, implicit in the use of these terms, is a flexible one which changes as regional economic transformations affect both household diet and the material interdependence of household members.

*Welch, John R. (Arizona)*

[14] SEASONALITY AND ADAPTIVE STRATEGIES IN THE CIRCUM-SONORAN UPLANDS

A dramatic shift in the Grasshopper area, Arizona, from Pueblo-III hamlets to a much larger but short-lived Pueblo-IV system of aggregated villages prompts questions about the adaptedness of agriculturally focused strategies in the Southwest's mountains. Data on Native American economies in the uplands east and north of the Sonoran desert and Western Apache crop yields contribute to a model of horticultural adaptation emphasizing balanced exploitation of diverse seasonally available wild and domesticated plant foods as well as game. The model underscores the impact of marked inter-annual precipitation variation on subsistence patterns and highlights the agriculturally reliant Pueblo-IV strategy as distinct from previous and subsequent adaptations to the region.

*Wells, Peter S. (Minnesota)*

[29] INDUSTRY AND CHANGING SPATIAL PATTERNS AT IRON AGE URBAN SETTLEMENTS

The first urban settlements of temperate Europe—the Late Iron Age oppida—yield abundant evidence of intensive manufacturing, especially large-scale production of iron tools. As the iron industry and associated crafts expanded, the spatial organization of the settlements changes in order to accommodate the growing needs of manufacturing. Results of ongoing archaeological investigations at the oppidum of Kelheim in Germany, together with results from other sites, show that new patterns of organization of settlement space emerged in these communities that later characterized urban spatial patterns throughout the Middle Ages.

*Wendorf, Fred, Angela E. Close (Southern Methodist) and Romuald Schild (Polish Academy of Sciences-Warsaw)*

[86] MIDDLE PALEOLITHIC OCCUPATIONS NEAR BIR SAHARA AND BIR TARFAWI, EGYPTIAN WESTERN DESERT

Several Middle Paleolithic sites have been excavated in Southwestern Egypt, associated with a complicated sequence of small lakes resulting from local rainfall of around 500 mm. per year. They

have been dated (by ESR, U-Series, and TL techniques) between 175,000 and 70,000 years ago. Within-site artifact distributions suggest multiple reoccupations by small groups with monotonous tool kits dominated by denticulates. Most of these shoreline sites are probably day-time use areas, perhaps for processing plant foods and for secondary lithic workshop activities.

*Wertime, Richard A. and Richard A. Wertime (Archaeology Magazine)* [45]

*West, G. James (Bureau of Reclamation), Owen K. Davis (Arizona) and William J. Wallace (California State-Long Beach)*

[07] ENVIRONMENT AND ARCHAEOLOGY OF TULARE LAKE, CALIFORNIA: A PRELIMINARY EXAMINATION

Tulare Lake is in a large downwarped basin of the San Joaquin Valley. Its shoreline and size have fluctuated greatly throughout the Pleistocene and Holocene as a result of climatic change and tectonic movement. Artifacts and megafaunal remains co-occur on the surface of Dudley Ridge, a long structural feature that extends along the southwest margin of the lake. Sediments, pollen, and the local geomorphology are reviewed in an effort to develop approaches for the interpretation of the archaeological record.

*Wettstaed, James and Halcyon LaPoint (USFS-Custer)*

[30] SHORT AND LONG TERM EFFECTS ON SITE PRESERVATION DUE TO WILDFIRES

Following the historic fire season of 1988, archaeologists on the Custer National Forest investigated the effects of wildfires on prehistoric site integrity. The fires on the Custer burned in a variety of environmental situations, from heavy timber to prairie grasslands. Short and long term effects have been found. Short term effects include fire damage, suppression damage and erosion. Blow downs, regrowth patterns, and increased wind and water erosion continue to effect sites over time. A number of mitigative measures can be taken to protect sites from these impacts.

*Whalen, M. (see Minnis, P. E.)* [33]

*Wharton, Jeffery T. (Navajo Nation Archaeology Department)*

[79] NOLAND'S FOUR CORNERS STORE

Noland's "Four Corners Store" was one of the first posts for trade along the banks of the San Juan River. Originally constructed in 1884 or 1885, the store was located outside the Navajo Reservation. In 1905 the reservation boundary was moved northward, encompassing the store and surrounding lands. After witnessing several owners and periods of discontent among the Indian and Euro-American populations, the store was finally closed circa 1920. During its lifetime it was a major influencing factor in the social, political, and economic development of the area.

*Whatley, William J. (Archaeological Research Exploration)*

[15] GALLINASAZI? INVESTIGATING WHO ON THE BASIS OF WHAT AND WHERE

Bordering the Chacoan Anasazi towards the west, the Upper Rio Grande Anasazi towards the southeast, and hunter-gatherer populations towards the northeast, the Gallina Culture personifies a case of contemporaneous peripheral development based in part on selective assimilation. In many respects, the Gallina Culture parallels the in situ development of the Fremont Culture situated in Utah and northwestern Colorado. This observation raises the possibility that the Gallina people are not of Anasazi origin, and may represent a different language group coexisting in a pueblan state. Although grand scale theory, these possibilities are probed through an examination of the archaeological record.

*White, Ray (Miami Nation of Indians for the State of Indiana)*

[26] BUILDING COOPERATION BETWEEN INDIANS AND ARCHAEOLOGIST

Communication among professional archaeologists, Native American communities, and elected officials on concerns involving the reburial of human remains and the need for completing scientific research is increasing. This discussion will offer perspectives on State reburial legislation, historic preservation requirements, and opportunities for enhancing constructive interaction among interested parties.

*Whittaker, Fran H. (Washington)*

[61] RELATIVE DATING OF SURFACE MATERIALS USING THE FLUORINE CONTENT OF BONE

Relative dating of bone through the measurement of fluorine content has been found useful but has not been utilized to its fullest extent. This study applies this technique to both human and mammal bone from four surface sites in the Little River Lowland of southeast Missouri. These small sites, found prehistorically in topographic highs within a vast cypress swampland, contain within their plowzones a wide variety of artifacts ranging in age from the Late Archaic through the Mississipp-

pian time periods. Meaningful clusters are defined which are then relatively ordered. Results are present and the implications for culture historical explanations are discussed.

*Whittaker, J. (see Kamp, K.) [73]*

*Whittington, Stephen and Scott Zeleznik (Penn State)*

**[12] GROWTH TRAJECTORIES OF NEIGHBORING RURAL ELITE RESIDENTIAL COMPOUNDS IN THE OSTUMAN POCKET, COPAN, HONDURAS**

Two Maya residential compounds near Copan were intensively test-pitted during 1989. Preliminary analysis indicates that each compound followed a different trajectory of growth, yet achieved large size and apparent success in a restricted geographical area. The larger site (Ostuman) was founded in the Early Classic and served as an administrative and ceremonial center, while the smaller site (Los Mangos) was founded only in the Late Classic and functioned as a craft and manufacturing center. Both were functioning even after Copan's political collapse, indicating continuity of social life in this part of the former polity for some time.

*Whyte, Thomas (Appalachian State)*

**[30] AN EXPERIMENTAL STUDY OF BURNED FISH BONES FROM ARCHAEOLOGICAL SITES**

Reconstructing patterns of cookery and the disposal of animal remains on archaeological sites requires the analyst to distinguish bones burned through cookery from those burned through disposal. Experimentation in the roasting of whole fish and the deposition of bones of boiled fish in open fires indicates that certain types of fish represented on late prehistoric sites in Virginia had been roasted while others had not.

*Wicker, Nancy (Minnesota)*

**[06] THE POLITICS OF ADORNMENT: GENDER, STATUS, AND THE CONSUMPTION OF PRECIOUS METALS IN MIGRATION PERIOD SCANDINAVIA**

Among the gold objects produced in Migration Period Scandinavia were stamped disc pendants called bracteates. Based on inferences from grave finds, it has been assumed that bracteates adorned women as expression of status. However, a few have been found in male graves, either in association with the finger bones, perhaps held in the hand or a small bag, or near the mouth, reflecting the classical practice of placing a coin in the mouth of the deceased. This paper examines how male use of this object type seems to reflect commercial significance, whereas the female prerogative was use as personal adornment.

*Widmer, Randolph J. (Houston) and James J. Sheehy (Penn State)*

**[36] ARCHAEOLOGICAL IMPLICATIONS OF ARCHITECTURAL CHANGES IN THE DEVELOPMENT CYCLE OF A MODERN POTTERY WORKSHOP IN TEOTIHUACAN**

Short term structural and functional changes in architectural units occurring within a modern pottery craft workshop in San Sebastian, Mexico, are described. Changes include not just architectural modification, or new construction, but the complete functional reorganization of rooms, and the replacement of artifact categories. The architectural sequence in the Middle Horizon pottery workshop of Tlajinga 33, Teotihuacan, is then reexamined from the perspective of the development cycle in the modern craft workshop and the similarities and differences between the two evaluated.

*Wigand, Peter E., Martha L. Hemphill (Quaternary Sciences Center-Desert Research Institute) and Cheryl Nowak*

**[38] LATE PLEISTOCENE AND HOLOCENE CLIMATE CHANGE IN SOUTHERN NEVADA**

Past research in southern Nevada revealed two lower-tree-line depressions since 21,000 BP. Recent reconstructed vegetation history using pollen from cores and plant macrofossils from fossil woodrat dens verifies depressions at 21,000 BP and 15,500 BP, and indicates additional depressions around 9,000 and 4,000 BP. Lowered tree-line around 21,000 BP probably was caused by low annual temperature. The 15,500 BP depression occurred when the jet stream split and the southern branch overlay southern Nevada. About 9,000 BP northward penetration of monsoonal rains produced lower tree-lines. Tree-line depression about 4,000 BP was the consequence of the onset of Neoglacial conditions.

*Wigand, P. E. (see Reid, K. C.) [32]*

*Wilcox, David R. (Museum of Northern Arizona)*

**[20] FACTORS AFFECTING THE FIRST APPEARANCE OF SINAGUA VILLAGES**

Sinagua sites classifiable as villages first appeared in the Flagstaff area in the middle 1100s A.D. Previous to that only hamlets, farmsteads, and seasonal sites are known. Possible factors affecting the reorganization of Sinagua populations into small villages and their associated site clusters are discussed. It is argued that the adoption of Hohokam-style ballcourts a century earlier led to increased

wealth, greater interaction with neighboring groups, and changes in household organization. Village formations emerged as a response to changes in the structure of the macroregional economic field, permitting the Sinagua to take advantage, however briefly, of unique exchange opportunities.

*Wilcox, D. R. (see Samples, T.) [73]*

*Williams, I. (see Limp, W. F.) [66]*

*Williams, Sloan R. (Northwestern), Jonathan L. Longmire (Los Alamos National Laboratory) and Lane A. Beck (Peabody Museum)*

**[61] HUMAN DNA RECOVERY FROM ANCIENT BONE**

Human DNA has been isolated in a skeleton from the Estuquina site, a Late Intermediate Period site in southern Peru (ca. 1300 AD). A radioactively labeled sample of the bone DNA used as a probe, Hybridized well with modern human DNA in a slot blot test. This indicates that the DNA is human, and not an invasive fungus or microorganism. The implications for archaeological research include the examination of migration patterns, political organization, marriage alliances and familial relationships from a new perspective.

*Willig, Judith A. (Washington State-Pullman)*

**[07] PALEO-ARCHAIC LAKE-MARSH ADAPTATIONS AT THE PLEISTOCENE-HOLOCENE BOUNDARY IN THE NORTHERN ALKALI LAKE BASIN, OREGON**

Reconstructions of paleolandscape, lake history and early human occupations in the northern Alkali Lake Basin, Oregon—between 12,000 and 7,000 B.P.—suggest a long history of dynamic Archaic foraging and settlement patterns “tethered” to changing lake-marsh conditions. In particular, a two-peak florescence of Western Stemmed sites is evident between 10,000 and 8,000 B.P., the earlier peak radiocarbon dated at 9,600 B.P. These occupations are associated with two early Holocene strandlines and remains of marsh dwelling gastropods, and correspond to two mesic episodes documented in the regional climatic record at about 9,500 and 8,500 B.P.

*Wilshusen, Richard H. (Colorado-Boulder) and Mark D. Varien (Crow Canyon Archaeological Center)*

**[20] HAMLETS AND VILLAGES IN PRESTATE SETTINGS: A WORLDWIDE PERSPECTIVE**

Archaeologist working in prestate settings typically distinguish between dispersed settlements consisting of multiple hamlets and aggregated settlements characterized by villages of one to five hundred people. However, there has been little discussion of how aggregated and dispersed communities differ from one another—on other than a demographic basis. Using a random sample of prestate societies from the HRAF Standard Sample and a judgement sample of formative archaeological examples, we will outline some of the basic organizational and economic differences between dispersed and aggregated communities for prestate societies.

*Wilshusen, R. H. (see Schlaeger, S.) [56]*

*Wilson, Douglas C. (Arizona)*

**[60] DISCARD DISTRIBUTIONS AND THE MEASUREMENT OF HUMAN BEHAVIOR**

Two distinctive types of human behavior which can be reconstructed from household discards are (1) activities related to use and (2) activities related to storage. These two behavioral types are related to two characteristic distributions of refuse. The material traces of these activities represent a measure of behavior with which aspects of both living and prehistoric populations might be compared. Modern refuse data collected by the Garbage Project is used to illustrate both the refuse patterning and associated behaviors. Methods to examine these same processes in archaeological deposits are outlined.

*Wilson, Samuel M. (Texas-Austin)*

**[62] DANGEROUS WATERS: CONTACT PERIOD INTERACTION SPHERES IN THE LEEWARD ISLANDS**

The contact period in the Caribbean is often seen as a brief cataclysm that in a few decades decimated the indigenous populations. The impact of European contact, however, manifested itself in different ways at different times in different regions of the Caribbean. This paper looks at the period from 1492 until around 1650, in which Spanish, English, French, and Dutch groups were exploring and settling the Leeward Islands. From their accounts, and from archaeological research in the region, a picture emerges of a widely distributed population which relied on a high degree of mobility to survive in the competitive political environment of the contact period.

*Wilson, Samuel M. (Texas-Austin) [Discussant 18]*

*Winchell, F. (see Hietala, H.) [61]*

**Windes, Tom (National Park Service) and Dabney Ford (Chaco Culture National Historic Park)**  
**[17] THE EARLY BONITO PHASE IN THE CHACO CANYON AREA**

The role of the early Bonito phase to our understanding of the Chaco Phenomenon is an important one. The period is poorly defined and far less distinctive than the soaring multi-story massive stone houses and attendant trappings that follow it during the Classic Period. In our quest for the definition of "what is Chaco", this paper explores this early period, its continuity with earlier and later Anasazi occupations, and its unique components that comprise the beginnings of the Chacoan Bonito phase.

**Wingard, John D. (Penn State)**

**[12] THE ROLE OF SOILS IN THE DEVELOPMENTAL SEQUENCE AT COPAN, HONDURAS**

Soils are one of the most important resources in an agricultural society. At Copan, Honduras there is evidence that the distribution of soils of varying agricultural quality played an important role in shaping the settlement patterns of the Classic and Postclassic Maya. Furthermore, the depletion of this resource may have been a key factor in the dramatic decline in population at the end of the Classic period. Nutrient depletion and the increasing reliance on highly erodible soils, resulting from population growth and the escalating demand for agricultural commodities, led to a marked decline in the availability of arable land.

**Winsborough, B. M. (see Neely, J. A.) [51]**

**Winsborough, B. M. (see Peterson, J. A.) [47]**

**Wise, Karen (Northwestern) and Niki Clark (Washington)**

**[25] THE COTTON PRECERAMIC PERIOD IN THE SOUTH-CENTRAL ANDES**

The Late Preceramic Period (after 5000 B.P.) in the central Andes is known for complex social, political, and religious organization, the presence of monumental architecture, and an elaborate cotton textile industry. Cultural manifestations during this time period in the south-central Andes have long been thought to be less complex. Recent research at Late Preceramic sites in southern Peru reveals the presence of sedentary habitations, aggregated settlements, distinctive cotton textiles, and a complex of paraphernalia apparently associated with the use of hallucinogenic drugs. Research in domestic and midden contexts provides new data from this time period in southern Peru, and demonstrates variation in domestic architecture from sites within close proximity of one another, and across the south-central Andean region.

**Witschey, Walter R.T. (Tulane) and Elia del Carmen Trejo A. (Centro Regional de Quintana Roo, INAH, Mexico)**

**[12] MUJIL SETTLEMENT PATTERNS: A MODEL FOR THE EAST COAST POSTCLASSIC**

Muyil is an ancient Maya site on the Quintana Roo East Coast occupied from AD 1–1500. It served as a port for Cobá during the Classic. Recent field surveys indicate later extensive low-density settlement at moderate distances from the civic and ceremonial center of the site. The Muyil pattern of settlement in the Postclassic serves as a model for the study of other east coast sites which flourished between Tulum and Cancún. It may represent the settlement forms at Spanish contact, when first explorers noted numerous vigorous settlements along the coast.

**Wollin, Jeffrey and Timothy M. Kearns (Division of Conservation Archaeology)**

**[79] VARIABILITY IN NAVAJO SETTLEMENT AND SITE TYPE IN THE MIDDLE SAN JUAN RIVER WATERSHED**

A recent large scale archaeological survey on the Navajo Reservation and adjacent areas of southeast Utah has generated a substantial body of data bearing on the Navajo settlement of the region. Variation in the distribution and type of Navajo sites is identified and examined relative to population and economy.

**Wright, III, Henry T. (Michigan) [Discussant 20]**

**Wright, Henry T. (Michigan) [Discussant 46]**

**Wright, Katherine Irene (Yale)**

**[47] GROUND STONE ASSEMBLAGE VARIATION AND SUBSISTENCE STRATEGIES IN THE NEAR EASTERN LEVANT, 22,000–5,500 B.P.**

Data on 19 ground stone assemblages from Jordan are presented in order to clarify the significance of ground stone technology in the evolution of sedentary agriculture in southwestern Asia. The sites span 22,000 to 5,500 B.P. and include transient camps and villages with architecture in a variety of environments (e.g. Beidha, Ain Ghazal, Azraq). When whole assemblages are analyzed with a technological perspective, ground stone tools shed light on the relationship of resource distribution

to patterns of consumption promoting early sedentism. Portability and caching of grinding tools were basic to their role in late Pleistocene/early Holocene subsistence systems.

**Wurtzburg, Susan (SUNY-Albany)**

**[70] SAYIL (YUCATAN MEXICO) LITHICS: IMPLICATIONS FOR URBAN ECONOMIC ORGANIZATION**

This paper presents the results of the analysis of lithics from Sayil (800–1000 AD), and the implications of said results for understanding the socio-economic organization of a Terminal Classic Maya city. A functional analysis of the lithics permits some delineation of the reduction sequence, and its spatial manifestations. These artifacts are placed in their regional context as a Puuc assemblage. The lithic data, with their spatial attributes, are evaluated in socio-economic terms, and ultimately, are used to test models of urban organization.

**Wylie, Alison (Western Ontario)**

**[46] "AN UNEXAMINED LIFE IS NOT WORTH LIVING": FORTHRIGHT REALISM AND SCIENTIFIC PRACTICE IN ARCHAEOLOGY**

The reflective turn taken by American archaeology in the 1960s and 1970s raised a number of challenging questions about fundamentals: the nature of the subject domain, the aims of the discipline, and the epistemic and methodological ideals that should govern its inquiries. This paper will examine the answers formulated by Pat Watson in connection with the third of these questions, given her commitment to scientific objectives (where the second is concerned). Realist commitments have been central to her vision of the prospects of a scientific archaeology from the outset, and they are only just beginning to find full programmatic and practical articulation.

**Wylie, Jerry (USFS-Intermountain Region) and Stan McDonald (USFS)**

**[52] MEETING THE PUBLIC'S NEED FOR HERITAGE RESOURCE EXPERIENCES**

Providing opportunities for the public to experience and understand the past is an exciting and challenging aspect of managing cultural resources on our National Forests. Modern marketing principles require a customer orientation and emphasis on quality products, as well as effective delivery systems and feedback to measure customer satisfaction. The diversity of sites and public interest call for a wide range of approaches; limited budgets encourage the use of volunteers and partnerships; and serendipity demands quick, opportunistic responses. Several successful projects are examined to illustrate these principles, as well as the limitations of the approaches used.

**Yellen, J. E. (see Brooks, A. S.) [86]**

**Yentsch, Anne (Historic Morven) [Discussant 58]**

**Yerkes, Richard W. (Ohio State)**

**[70] MICRODRILLS AND SHELL BEAD PRODUCTION IN MISSISSIPPIAN SOCIETIES**

Lithic functional analysis is used to investigate shell craft production in Mississippian societies (A.D. 1000–1400) with special emphasis on Cahokia Mississippian populations in the American Bottom region. The technology of the Cahokia "Microlith" industry is examined, and the microwear evidence that indicates that Cahokia microdrills were specialized tools used to drill shell beads, gorgets, etc., is summarized. The distribution of shell drills and shell materials at sites in the Cahokia settlement system is outlined and the implications for craft specialization in Mississippian societies is discussed.

**Yohe, Robert Michael (UC-Riverside)**

**[61] A REASSESSMENT OF CULTURE HISTORY IN THE WESTERN GREAT BASIN: DATA FROM A NEW SUITE OF RADIOCARBON DATES FROM THE ROSE SPRING SITE (CA-INY-372)**

New archaeological investigations at the Rose Spring site in southeastern California have forced a reevaluation of existing cultural chronologies for the western Great Basin. The currently accepted chronologies for this region have been in large part based upon the earlier investigations conducted at this site in the 1950s. Rose Spring (the type site for Rose Spring projectile points) has been pivotal to such discussions because of its artifact-rich, deep, culturally and physically stratified deposit. A suite of more than twenty new radiocarbon determinations has provided data for a revised view of regional prehistory.

**Yoon, David (CUNY-Graduate Center)**

**[40] AN ARCHAEOLOGICAL APPROACH TO REGIONAL POLITICAL STRUCTURES**

Archaeological attempts to define the boundaries of polities are often less than convincing. Perhaps the problem is a concept of polity base on an ethnographic or historical point of view. Other concepts may be equally valid but more appropriate to archaeological data. Looking at the spatial distribution

of evidence produced by or affected by different sorts of political processes may allow insights into political structures other than those recognized by ethnographers or historians.

*York, Robert, Gary Matlock, Allen Kane and E. Polly Hammer (USFS)*

[52] THE VIEW FROM THE ROCKY MOUNTAINS

The National Forests of the Rocky Mountain Region are actively involving the public in their CRM programs. The efforts of the San Juan National Forests are diverse and many, including: placement of protection-oriented historic markers, development of museum exhibits, construction of handicapped access trails at the Chimney Rock Archeological Area, formation of a citizens group to support the Forest's CRM programs, the interpretation of a historical Ute campground in cooperation with the Ute Mountain Tribe, and the execution of a cost-share agreement with the Four Corners School of Outdoor Education to conduct research at the Miller Camp site. During 1988 and 1989 the Gunnison and San Isabel National Forests, in cooperation with the Colorado State University, began a research and interpretation project of the Monarch Pass Game Drive.

*Young, D. C. (see Hattori, E. M.) [07]*

*Young, Lisa C. (Arizona)*

[14] PITHOUSES AND FIELDHOUSES: A COMPARISON

This paper will compare two different types of sites: Pithouse villages and fieldhouses. Although these sites are argued to be used seasonally by farming populations, the residential mobility patterns of the groups using these two types of sites is expected to be quite different. Data from recent excavations in the Homol'ovi area of northeastern Arizona will be used to examine how the artifact assemblage of these sites differs. It is expected that differences in mobility will be reflected in the assemblages of these seasonally used sites.

*Young, M. Jane (New Mexico) [Discussant 44]*

*Young, Peter A. (Archaeology Magazine) [45]*

*Zalucha, L. Anthony (Paleoethnobotanical Consulting)*

[53] EARLY HOLOCENE VEGETATION OF THE CENTRAL GREAT PLAINS BASED ON CHARCOAL FROM THE ALLEN SITE

Although other models have been proposed, most authorities agree that in the early Holocene Great Plains boreal forests were rapidly replaced by grasslands. Identified charcoal deposited c.9500 B.P. at the Allen site in western Nebraska suggests that immediate post-glacial vegetation history was more complex. Along with other identified taxa, the presence of red mulberry (*Morus rubra*) 250 miles west of its modern distribution suggests that a brief (c. 500–1000 years) interval of deciduous forest may have existed between boreal and grassland stages. The mulberry also strengthens previous portrayals of this period as relatively cool and/or moist.

*Zapata, D. O. (see Ringle, W. M.) [12]*

*Zeanah, David William (Utah)*

[42] PRE-VILLAGE ALPINE LAND-USE IN THE WHITE MOUNTAINS, CALIFORNIA

Systematic survey in alpine areas of the White Mountains of California identified 385 prehistoric sites, thirteen of which were partially excavated. Site distribution, site structure, and lithic assemblage composition data allow an analysis of high altitude subsistence and settlement prior to Rosegate times. The analysis indicates that Elko and Little Lake period hunter-gatherers logically exploited alpine resources from low altitude base camps. These logistic task groups specifically targeted mammal rather than plant resources. The relevance of these results are discussed in light of current evolutionary models of resource use and transport costs in the Great Basin.

*Zedeno, Maria Nieves (Southern Methodist) and Lawrence Anovitz (Arizona)*

[22] IMAGE PROCESSING: AN ALTERNATIVE TECHNIQUE FOR IDENTIFYING THE PROVENIENCE OF PREHISTORIC CERAMICS FROM CHODISTAAS, EAST-CENTRAL ARIZONA

Current research on production and exchange of prehistoric ceramics demands that archaeologists adopt accurate and efficient techniques for identifying sources of pottery manufacture. The combined application of image processing and scanning electron microscopy to polish thin sections provides simultaneous petrographic characterization, sedimentological information, and extensive areal point counting of mineral inclusions in ceramics. Use of these methods for identifying local vs. nonlocal ceramics from Chodistaas, East-central Arizona, demonstrate that image processing is a powerful alternative to manual point counting using a polarized microscope. Acquisition of detailed mineralogical

cal information from large samples increases the archaeologists' ability to make behavioral inferences of ceramic production and exchange.

*Zeidler, J. (see Oyuela, A.) [09]*

*Zelevnik, S. (see Whittington, S.) [12]*

*Zier, Christian J. and Stephen M. Kalasz (Centennial Archaeology, Inc.)*

[72] RECON JOHN SHELTER AND THE ARCHAIC-WOODLAND TRANSITION IN EASTERN COLORADO

Recon John Shelter (5PE648) is located in the Colorado Piedmont in the high plains—foothills transition zone. Cultural deposits 2.5 m thick represent three radiocarbon-dated components: Middle Archaic period (ca. 4,400–3,700 B.P.), Late Archaic period (2,000–1,800 B.P.), and Early Ceramic (Woodland) period (1,800–1,000 B.P.). A Hunting-gathering subsistence economy, supplemented with maize beginning in the Late Archaic period, is evident. Subsistence pursuits and technologies changes little over the prolonged period of occupation. Analysis of artifactual and nonartifactual remains, combined with geomorphic investigations, indicates that a remarkably stable long-term adaptation is represented by the site.

*Zubrow, Ezra (SUNY-Buffalo)*

[11] ROUTES OF EXTINCTION—POCKETS OF SURVIVAL

This paper reports on the application of spatial data handling, GIS algorithms, and data model structures to large scale epidemics. New World conquest epidemics destroyed approximately 85% of the prehistoric population. Epidemics were simulated on theoretical and actual prehistoric site distributions using Arc-Info. The initial analyses have shown that epidemics a) leave pockets of survival which follow a complicated but statistically significant pattern across the landscape, b) effect small settlements (500) and medium size settlements (1500) very similarly in terms of "time to extinction." These predictions are tested against historical patterns.

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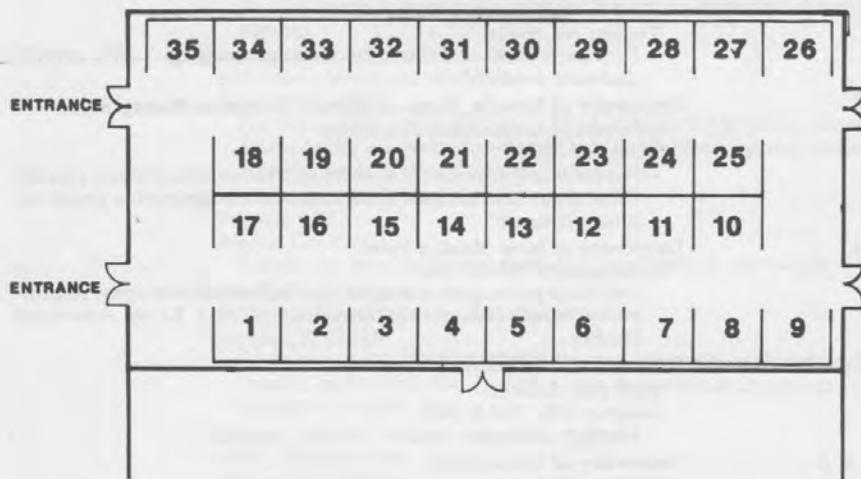
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