

*DeVry*

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**Society for  
American Archaeology**

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52nd ANNUAL MEETING

May 6–10, 1987

Royal York Hotel—Toronto

PROGRAM AND ABSTRACTS

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# ETHNOLOGY MONOGRAPHS

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Anthropology Division



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Editor, ETHNOLOGY  
Department of Anthropology  
University of Pittsburgh

## PROGRAM AND ABSTRACTS of the Fifty-second Annual Meeting Toronto, Ontario May 6-10, 1987

### Contents

General Information .....	4
Program .....	15
Abstracts of Symposia .....	39
Abstracts of Papers .....	45
Abstracts of Posters .....	139
Exhibitors .....	142

The annual meeting of the Society of 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.

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## SOCIETY FOR AMERICAN ARCHAEOLOGY Fifty-second Annual Meeting

*Program Chair:* Timothy Kaiser  
Department of Anthropology  
University of Toronto

*Program Committee:* Elizabeth A Graham  
William M Hurley  
William N Irving  
David M Pendergast

*Local Arrangements Chair:* Mima Kapches

### Acknowledgements

The Program Chair wishes to thank Robin Armstrong, Dean of Arts and Science, University of Toronto, for his financial support of the activities of the 1987 SAA Program Committee, and Susan Julig, for word-processing the Preliminary and Final Programs.

Cover illustration: A popeyed birdstone, ca. 1000 B.C., discovered in Toronto, and now in the collection of the Royal Ontario Museum. Drawing by Emil Hustiu.

### Officers of the Society

*President:* Don D Fowler

*President-elect:* Dena Dincauze

*Secretary:* Bruce D Smith

*Treasurer:* Robert J Sharer

*Editor:* Patty Jo Watson

*Editor-elect:* W. Raymond Wood

*Executive Committee Members:* Keith Kintigh  
J. Jefferson Reid  
Prudence Rice  
David Hurst Thomas

## 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, 1511 K Street NW, Washington, DC 20005.

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

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

**Exhibits** Exhibits will be displayed in the Canadian Room 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 Canadian Room during the exhibit hours.

**Message and Information Center** A self-service message center will be open in the Canadian Room from 4 PM to 8 PM Wednesday, and from 8 AM to 6 PM Thursday through noon Sunday.

**New Member Reception** Officers of the Society will host a reception for all new SAA members and for members attending their first annual meeting on Wednesday at 8 PM in the Algonquin Room.

**Placement Service** A placement service will be conducted in the Tudor 8 and 9 from 5 PM to 8 PM on Wednesday, from 8 AM to 5 PM 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 4 PM to 8 PM on Wednesday, from 7:30 AM to 4 PM on Thursday, Friday and Saturday. Members who preregistered by April 15 should claim their badges and programs at the advance registration desk. Wearing of the badge is required for admission to all sessions and the exhibits.

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

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

**Slide Screening Room** A 35mm slide projector and screen will be available in the Newfoundland Room 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
23th	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

33th	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
43th	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

## 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 R 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		

**AWARDS TO ARCHAEOLOGISTS, 1946–85**  
**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 of 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
- 1947 John Otis Brew
- 1948 Alex Dony Krieger
- 1949 Hallam Leonard Movius, Jr.
- 1950 Emil Walter Haury
- 1951 Frank Harold Hanna Roberts, Jr.
- 1952 Alfonso Caso
- 1953 Gordon Randolph Willey
- 1954 William Duncan Strong
- 1955 John Eric Sidney Thompson
- 1956 Junius Bouton Bird
- 1957 James Bennett Griffin
- 1958 Jesse David Jennings
- 1959 Irving Rouse
- 1960 Samuel Kirkland Lothrop

The *Alfred-Vincent Kiddler 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:

- 1950 Alfred Marston Tozzer
- 1953 Earl Halstead Morris
- 1956 Samuel Kirkland Lothrop
- 1959 Charles Corradino Di Peso
- 1962 Tatiana Proskouriakoff
- 1965 Neil Merton Judd
- 1968 Paul Sidney Martin
- 1971 Richard Stockton MacNeish
- 1974 Gordon Randolph Willey
- 1977 Emil Walter Haury
- 1980 William Timothy Sanders

- 1983 Samuel Watson Smith
- 1986 Ignacio Bernal

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 inscripted citation.

The awardees have been:

- 1975 Carl Haley Chapman  
Charles Robert McGimsey III
- 1980 Gordon Randolph Willey
- 1981 Albert Clanton Spaulding
- 1982 Jesse David Jennings
- 1983 Hannah Marie Wormington
- 1984 James Bennett Griffin
- 1985 Emil Walter Haury
- 1986 Waldo R Wedel

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
- 1979 Peter J Mehringer
- 1980 James B Griffin
- 1981 Karl W Butzer
- 1982 David A Barreis
- 1983 John E Guilday (posthumously)
- 1984 (No Award)
- 1985 Roger T Saucier
- 1986 Donald K Grayson

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 awardees have been:

- 1985 Clarence H Webb, MD

## BUSINESS AND SOCIAL EVENTS

### Wednesday, May 6

All Day	Field Trip—See "Special Events" for details	
8:00 AM	Association of Transportation Archeologists— Annual Meeting	Confederation Room #6
9:00 AM	Society for American Archaeology— Executive Committee Meeting	New Brunswick Room
9:00 AM	Society for American Archaeology— Governmental Affairs Committee Meeting	Prince Edward Island Room
9:00 AM	National Association of State Archeologists— Workshop and Annual Business Meeting	Nova Scotia Room
1:00 PM	Society of Professional Archeologists— Executive Board Meeting	Prince Edward Island Room
3:00 PM	American Society for Conservation Archaeology— Executive Committee Meeting	Confederation Room #4
3:30 PM	Workshop—The Politically Savvy Archaeologist	Manitoba Room
8:00 PM	New Member Reception	Algonquin Room

### Thursday, May 7

Open House	Royal Ontario Museum—See "Special Events" for details	
8:00 AM	Committee on Public Archaeology	Manitoba Room
9:00 AM	Archeology Unit for the American Anthropological Association—Executive Committee Meeting	Nova Scotia Room
12 Noon	Society of Professional Archeologists—Annual Business Meeting	Manitoba Room
12 Noon	Society for Archaeological Sciences—Executive Committee Meeting	Prince Edward Island Room
5:00 PM	Society for Archaeological Sciences—Annual Meeting	Nova Scotia Room
5:30 PM	Reception—Royal Ontario Museum	
9:00 PM	Distinguished Lectures	Ballroom

### Friday, May 8

11:30 AM	Council of Presidents Luncheon (By invitation only)	Saskatchewan Room
1:00 PM	Society of Professional Archeologists— Executive Committee Meeting	Prince Edward Island Room
5:30 PM	Society for American Archaeology— Annual Business Meeting	Ballroom
7:00 PM	American Society for Conservation Archaeology— Annual Meeting	Library
7:00 PM	World War II Archaeology	Prince Edward Island Room
	See "Special Events" for schedule of Open Houses at the University of Toronto.	

### Saturday, May 9

9:00 AM	Society for American Archaeology— Executive Committee Meeting	New Brunswick Room
10:00 AM	American Society for Conservation Archaeology— Executive Committee Meeting	Prince Edward Island Room

### Sunday, May 10

All Day	Field Trip—See "Special Events" for details	
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## Special Events

WEDNESDAY, MAY 6

**Field Trip** A full day field trip for SAA members to the Museum of Indian Archaeology in London, Ontario. Dr William Finlayson will give a tour of the Museum and the reconstructed Lawson Iroquoian Village, located on the Museum grounds. Lunch is included. In the afternoon, on the return to Toronto, there will be a visit to the Crawford Lake Conservation Area, where Dr Finlayson will discuss the Iroquoian village excavation and reconstruction and the multi-year research project on archaeological sites in the vicinity. Dr Jock McAndrews of the Royal Ontario Museum Botany Department will give a special presentation on the merimictic lake which has provided an unusual environmental and chronological sequence for the nearby Iroquoian village.

WEDNESDAY—SUNDAY, MAY 6—10

**Toronto Historical Board Open Houses** The historic properties of the Toronto Historical Board will be open to attendees of the conference (see map). By showing your registration badge you will gain free admission to Colborne Lodge, Spadina, Mackenzie House, and Marine Museum and Historic Fort York during regular hours (Monday to Saturday 10:00 a.m. to 5:00 p.m., and Sunday 12:00 to 5:00 p.m.), May 6th to May 10th.

**George R. Gardiner Museum of Ceramic Art** The George R. Gardiner Museum of Ceramic Art, (Open Tuesday to Sunday 10:00 a.m. to 5:00 p.m.) is also offering free admission to conference attendees. Located across from the ROM on Queen's Park Crescent, south of Bloor. This Museum houses an extensive collection of ceramics.

THURSDAY, MAY 7

**Royal Ontario Museum Open House** On Thursday May 7, behind the scene tours of various Curatorial and Service Departments of the ROM will be offered. Because of ROM security requirements guided tours, for a limited number of participants, have been arranged for 10:00 a.m., 3:00 p.m. and 4:00 p.m. Departments that will be open are New World Archaeology, Egyptian, West Asian, Ethnology, and Conservation. Information for signing up for these tours will be available at the registration desk. Special requests for access to collections can be directed to specific ROM departments or to Dr. Mima Kapches 1-416-586-5727. The galleries of the ROM will be open during the meetings to SAA participants. Museum hours are daily 10:00 a.m. to 6:00 p.m.; Tuesday and Thursday 10:00 a.m. to 8:00 p.m.

The Botany Department of Royal Ontario Museum, located on the 3rd Floor in the Canadiana Building, 14 Queen's Park Crescent, will be open on Thursday May 7th from 10:00 a.m. to 4:00 p.m. for drop-in visitors. This department engages in palynological research, and the analysis of botanical specimens from archaeological deposits.

THURSDAY EVENING, MAY 7

**Reception:** The Royal Ontario Museum At 75  
On the evening of Thursday May 7 there will be a reception in the Royal Ontario Museum on the occasion of its 75th anniversary. For this evening, from 5:30 p.m. to 8:00 p.m., the museum galleries will be open. The ROM has arranged also for free access to those at the reception (from 6:30 to 8:00 p.m.) to the major special exhibition **Eye of the Beholder: Objects For Personal Adornment, Jewellery from the ROM collections and several other international institutions will be on display.**  
This will be a hosted reception, with the support of the Province of Ontario and the Ontario Heritage Foundation of the Ministry of Citizenship and Culture. It will be held in the Southwest Atrium of the ROM, a three storey high open space that exhibits the unique architectural details combining the old and new buildings of the museum.

FRIDAY, MAY 8

**University of Toronto Open Houses** On Friday May 8, 1987 several departments of the University of Toronto will host open houses for SAA delegates.

The *Iso-Trace Laboratory*, directed by Dr. W. Kieser, located in the subbasement of the McLennan Physical Labs (60 St. George) will give tours of their dating facilities from 9:00 a.m. to 4:00 p.m., on the hour and the half hour. After 4:00 p.m. the lab will host a reception for SAA members. Bring your dates!

The *Slowpoke Reactor Facility*, directed by Dr. R. Hancock, is located in the Haultain Building (see map). The laboratories are on the ground floor, enter through the doors shown with the arrow on the map. Tours will be offered between 9:00 a.m. and 4:00 p.m.

In the Mechanical Building, north of the Haultain building, Mr. L. Pavlish and Dr. A. V. Jopling will be presenting a *laboratory simulation of fluvial environments* to illustrate the movement of stone and bone particles. The flume demonstration will take place between 12:00 and 4:00 p.m. in the Hydraulics Laboratory on the 2nd Floor North Wing.

The *Argon mass-spectrometer facilities* are in the laboratories of Dr. Derek York. Dr. York will host a tour of these facilities. Those wishing to take the tour are requested to meet at 11:00 a.m. in the lobby of the McLennan building, 12 participants will be escorted to the facilities for the tour. Please note that because of the small size of the laboratory only one tour has been arranged.

The *Department of Anthropology* at the University of Toronto will host an open house in their laboratories at Sidney Smith Hall, room 561A, in the basement, from 12:00 to 4:00 p.m. Displays in the laboratory will highlight the work and the collections of the department. Refreshments will be served. Those wishing special tours are requested to contact the department technician, Mr. John Reid, 416-978-6293 to make arrangements.

In the South Borden Building, 487 Spadina Crescent (see map), two sections of the Department of Anthropology will also have open facilities from 1:00 p.m. to 4:00 p.m. on Friday May 8. Both are located on the 2nd floor. The *Northern Yukon Research Programme* under the direction of Dr. William Irving, and the *Fanual Archaeo-osteology Laboratory* directed by Dr. H. Savage will be open to SAA visitors.

SATURDAY, MAY 9

The Archaeological Resource Centre of the Toronto Board of Education will offer S.A.A. registrants the unique opportunity to tour Toronto on a historic streetcar. Departing from York and Wellington during the morning the historic Peter Witt Streetcar tour will include a stop at the groundbreaking ceremonies for the Ashbridge Estate Archaeological Project. This estate is the longest single family occupation of an original crown grant in the City of Toronto dating from 1793-1987.

Return trips to the Royal York will be provided. Additional details will be available at the registration desk.

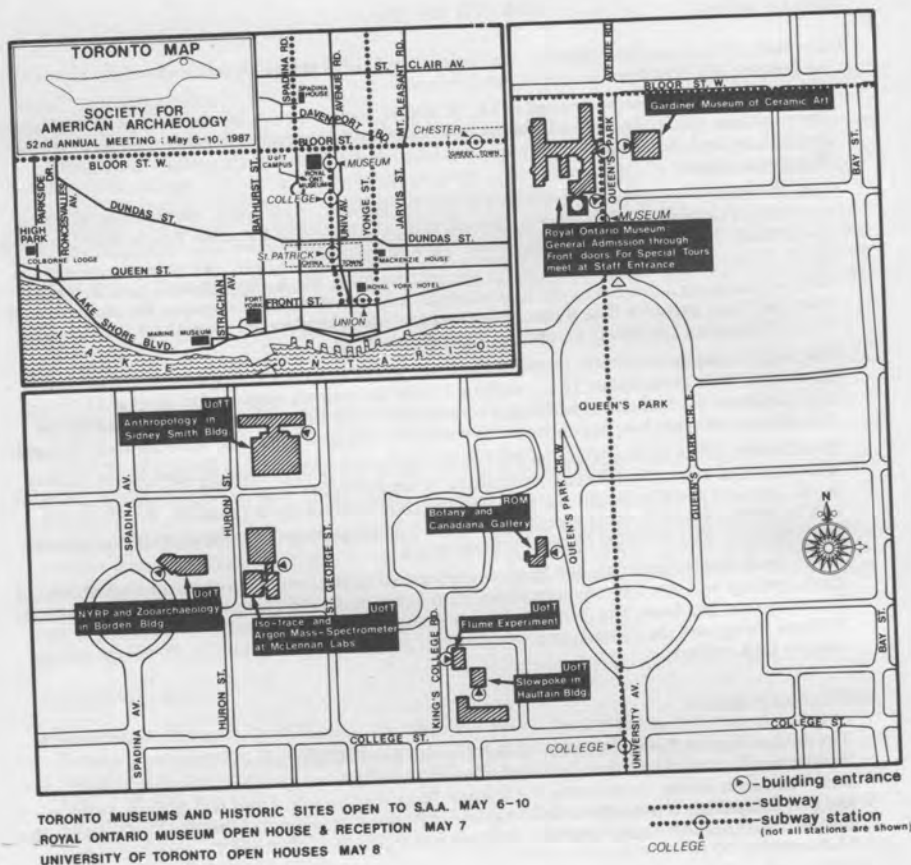
SATURDAY—SUNDAY, MAY 9—10

**Fort York** Special tours have been arranged of the ongoing archaeological projects at Fort York for Saturday May 9 from 1:00 to 3:00 p.m. and Sunday May 10 from 10:00 a.m. to 12:00 p.m. Fort York has the largest collection of original War of 1812 buildings in Canada. It played an important role in the war especially during the battle for the Town of York in April of 1813. The American explorer Brigadier-General Zebulon Pike lost his life in this battle. The archaeologists will be on-site for the tours.

SUNDAY, MAY 10

**Field Trip** A full day trip to the Peterborough Petroglyphs, located just north of Peterborough, Ontario in the Petroglyph Provincial Park. The Peterborough Petroglyphs are unusually well-preserved and undecayed; this Algonkian rock art site is one of the most artistically-complex sites in North America. Tour by Dr Ron Vastokas of Trent University.





## PROGRAM

THURSDAY MORNING MAY 7, 1987

### Poster Session: RECENT ADVANCES IN ARCHAEOLOGICAL RESEARCH

Canadian

#### Participants

Stephen R. Durrand and Jonathan O. Davis, Direct Video Input of Archaeological Data  
 James J. Hester, Robert M. Thorne and David L. Ford, Archaeological Site Preservation In Situ: Mitigation Without Excavation  
 Sheryl G. Oliver and Robert E. Warren, Predictive Modeling of Archaeological Site Location: A Comparison of Two Contrasting Upland Environments in the Midwest  
 Kevin P. McGowan, Late Woodland Settlement Patterns Around Lake Shelbyville in East Central Illinois  
 Charles B. Stout, Intrasite Relationships at a Mississippian Town Site in Illinois  
 Mona L. Colburn, Subsistence Remains from a Mississippian Period Site in Illinois  
 Anne Frazer Rogers, Upland Sites and Topography in the Southern Appalachians  
 John C. Ravesloot and Jon Czaplicki, The Tucson Aqueduct Phase B Project: New Data on the Tucson Basin Hohokam  
 William J. Parry and F.E. Smiley, Early Agriculture in the Northern Southwest: A Progress Report on Three Fir Shelter, Arizona  
 Richard Ahlstrom, "Casual" Repeat Photography and Hopi Architecture  
 Dena Doroszenko, Urban Archaeology on the University of Toronto Campus  
 Duncan Scherberger, The Archaeological Resource Centre  
 (Session continues until Saturday 12:00 noon, May 9, 1987)

### (1) General Session: BONE CHEMISTRY

Library

Chairperson: R.G.V. Hancock

#### Participants

- 8:00 Katherine Spielmann, Margaret J. Schoeninger and Katherine Moore, Human Diet at Pecos Pueblo  
 8:20 Donald Pate, Exchangeable Ions in Bone and Soil as Indicators of Postmortem Diagenesis  
 8:40 R.G.V. Hancock, M.D. Grynpas and K.P.H. Pritzker, Bones Lie

### (2) Symposium: PLUNDERERS, PROFITEERS AND PUBLIC ARCHAEOLOGY: PRACTICAL APPROACHES TO PREVENTING THE LOOTING OF ARCHAEOLOGICAL SITES AND THE TRAFFIC OF ANTIQUITIES

British Columbia

Organizer: Brona Simon

Chairpersons: William A. Fox and Brona Simon

#### Participants

- 8:00 Franco Ruffini and Paul Hooge, Public Education: A Positive Approach to the Artifact Trafficking Problem  
 8:40 John R. Halsey and James L. Martindale, The Sack of the Inland Seas: Shipwreck Plundering in the Great Lakes  
 9:00 Ann M. Early, Profiteers, Paymasters and Public Archaeology: Antiquities Trafficking in Arkansas  
 9:20 William A. Fox, Looting and Legislation in Ontario  
 9:40 David A. Walden, The Canadian Cultural Property Export and Import Act  
 10:00 Ellen Herscher, The Role of Museum Acquisition Policies

- 10:20 David M. Pendergast and Elizabeth Graham, Dipping Out the Ocean With a Spoon: Plundering on the International Scene  
 10:40 Discussant: Clemency C. Coggins

**(3) General Session: THE NEAR EAST**

Confederation 3  
 Chairperson: Robert C. Henrickson

**Participants**

- 8:00 Rolfe Mandel, Alan Simmons and William Farrand, Preliminary Observations on the Geomorphology of 'Ain Ghazal, Jordan  
 8:20 Alan H. Simmons, The 'Ain Ghazal Community Study: Preliminary Results of an Archaeological and Geomorphic Survey Near Amman, Jordan  
 8:40 E.B. Banning and Brian F. Byrd, Renovation in Domestic Architecture: The Changing Residential Unit at PPNB 'Ain Ghazal, Jordan  
 9:00 Gillian R. Rentley, The Corporate Structure of Early Bronze Age Urban Society at Bab Edh-Dhra', Jordan  
 9:20 Bruce T. Verhaaren, The Domestic Use of Space at Third Millennium Kurban Höyük  
 9:40 Guillermo Algaze, Mesopotamian Expansion and Its Consequences: Social Change in the Northern Periphery of Alluvial Mesopotamia in the Late Fourth Millennium B.C.

**(4) Symposium: THE EARLY UPPER PALEOLITHIC: EVIDENCE FROM EUROPE, THE NEAR EAST AND NORTH AFRICA**

Quebec  
 Organizers and Chairpersons: John F. Hoffecker and Cornelia A. Wolf

**Participants**

- 8:40 Pierre M. Vermeersch, The Early Upper Paleolithic in Egypt  
 9:00 Anna Belfer-Cohen and Ofer Bar-Yosef, Levantine Upper Palaeolithic Cave Sites—A Reappraisal  
 9:20 Anthony E. Marks and C. Reid Ferring, The Early Upper Palaeolithic of the Levant  
 9:40 Cornelia A. Wolf, Analysis of Faunal Remains from Upper Paleolithic Sites in the Levant  
 10:00 Craig Heller and Lawrence G. Straus, Explorations in the Twilight Zone: The Early Upper Palaeolithic of Cantabria and Gascony  
 10:20 João Zilhão, The Early Upper Paleolithic of Portugal  
 10:40 Francis B. Harrold, The Chatelperronian and the Early Aurignacian in France  
 11:00 Randall White, Production Complexity in Early Aurignacian Body Ormentation: The Case of Abri Blanchard and La Souquette  
 11:20 John F. Hoffecker, Early Upper Paleolithic Settlement on the Russian Plain  
 11:40 Discussant: Michael Jochim

**(5) Symposium: RECENT ARCHAEOLOGICAL AND ETHNOHISTORIC RESEARCH IN THE STATE OF OAXACA: A STUDY OF AN ANCIENT CORE AND ITS PERIPHERIES**

Territories  
 Organizers and Chairpersons: Bruce E. Byland and Gary M. Feinman

**Participants**

- 9:00 Stephen A. Kowalewski, The Production of Cultural Diversity  
 9:20 Arthur G. Miller, Mural Evidence from Interregional Interaction During MA IIIB/IV  
 9:40 Gary M. Feinman, From Frontier to Semi-Periphery: Prehispanic Settlement Patterns in the Ejutla Region, Oaxaca, Mexico  
 10:00 Linda M. Nicholas and Gary M. Feinman, Economic Specialization and Exchange in Oaxaca: The Production and Transport of Shell, Cloth, and Obsidian in the Ejutla Region  
 10:20 Robert N. Zeitlin, The Isthmus and the Valley of Oaxaca: Questions About Monte Alban Imperialism in the Pacific Lowlands  
 10:40 Judith Francis Zeitlin, Beyond the Shadow of Monte Alban: Classic Period Affiliations in the Coastal Lowlands  
 11:00 John M.D. Pohl and Bruce E. Byland, The Nature of Place Signs in the Mixtec Codices

- 11:20 Bruce E. Byland and John M.D. Pohl, The Reorganization of Political Control in the Tilantongo Valley from Formative to Postclassic Times  
 11:40 Discussant: Michael E. Whalen

**(6) Symposium: GEOARCHAEOLOGY OF THE ANDEAN COAST: RECENT ADVANCES**

Alberta  
 Organizers and Chairpersons: Daniel H. Sandweiss and James B. Richardson III

**Participants**

- 9:00 Alan K. Craig, Andean Land Snails as Palaeo- environmental Indicators  
 9:20 Jeffrey T. Hsu, Uplift of the Peruvian Coast Between 13.5 and 16S. Latitude  
 9:40 Michael E. Moseley, Christopher Ohm Clement and Jorge Elias Tapia, Geoarchaeology of the South Coast of Peru  
 10:00 Daniel H. Sandweiss, Harold B. Rollins and James B. Richardson III, Geoarchaeology of the Santa/Chao Region, Northern Peru: Alterations in Landscape, Climate, and Human Occupations  
 10:20 Lisa E. Wells and Jay S. Noller, Holocene Record of El Niño Events and Early Agriculture in the Rio Casma Valley, Peru  
 10:40 Harold B. Rollins, Daniel H. Sandweiss, Judith C. Rollins and Uwe Brand, Recognition of Large Magnitude El Niño Events Using Andean Coastal Shell Middens  
 11:00 Mark McConaughy and James B. Richardson III, The Holocene Beach Ridges of the Piura and Chira Rivers: The Impact of Sea Level and Climate Change on Cultural Development in Northwest Peru  
 11:20 Discussants: Jack Donahue and Thomas Lynch

**(7) Symposium: THE ARCHAEOLOGY OF SOUTH ALASKA: SUBSTANTIVE AND THEORETICAL CONTRIBUTIONS**

Confederation 456  
 Organizer and Chairperson: Richard H. Jordan

**Participants**

- 9:20 Robert E. Ackerman, The Early Cultural Horizons of Interior Southwestern Alaska  
 9:40 R.K. Harritt, A Model for Analysis of Late Prehistoric Occupation of the Naknek Region, Southwest Alaska  
 10:00 Don E. Dumond, The Northern Alaska Peninsula in Southwestern Alaskan Prehistory  
 10:20 Allen P. McCartney, Jean S. Aigner, Douglas W. Veltre, Nancy G. McCartney and Lydia T. Black, Settlement Patterns of Unalaska Island, Eastern Aleutians, Alaska  
 10:40 Jean S. Aigner, Lydia T. Black, Dominique Desson, Allen P. McCartney and Douglas W. Veltre, Historic Documents and an 18th Century Aleut Village on Unalaska  
 11:00 Lucy Lewis Johnson, Shumagin Island Research: Results from the Fringe  
 11:20 Robert E. Nelson, Quaternary Geology and Paleoecology of the Karluk Area, Kodiak Island, Alaska  
 11:40 Thomas Amorosi, The Karluk River and Uyak Bay Archaeofaunas

**(8) Symposium: INTERREGIONAL INTERACTION IN PREHISTORY**

Library  
 Organizers and Chairpersons: Patricia A. Urban and Edward M. Schortman

**Participants**

- 9:20 Edward M. Schortman, Diffusion Vs. Evolution: An Old Debate and a Current Problem  
 9:40 Winifred Creamer, The Role of Ethnic Affiliation in Interregional Interaction in Northern Honduras  
 10:00 Jane Schneider, Warp, Weft, Pattern and Hue: Aesthetic Issues in the Interaction of Luxury Cloth Traditions  
 10:20 David Webster, The Study of Maya Warfare: Its Implications for Our Understanding of the Maya and for Maya Archaeology  
 10:40 Steadman Upham, Interaction and Isolation: The Empty Spaces in Pan-Regional Political and Economic Systems  
 11:00 Peter S. Wells, Tradition, Identity, and Change Beyond the Roman Frontier

- 11:20 Mary W. Helms, Travel Motives, Elite Aspirations, and the Cosmological Context of Geographical Distance  
 11:40 Richard A. Pailles and Joseph Whitecotton, Culture and Exchange in Mesoamerica and the Southwest

**(9) Symposium: DIXIE CUPS AND CROWN JEWELS: ANALYTICAL APPROACHES TO THE ORGANIZATIONAL PROPERTIES OF STONE TOOL TECHNOLOGIES**

Ballroom  
 Organizers and Chairpersons: Steven Kuhn and Signa Larralde

**Participants**

- 9:40 Larry R. Kimball and Lawrence H. Keeley, The Detection of Planning in Paleolithic Assemblages  
 10:00 Randolph E. Donahue, Microwear Analysis in the Study of Curated and Expedient Technologies in the Italian Upper Palcolithic  
 10:20 Steven Kuhn, Resharpener, Re-use and Site Re-occupation in the Central Italian Mousterian  
 10:40 Phillip W. Volkman, Preliminary Evidence for Diachronic Changes in Curation Habits at Boker Tachtit, Israel  
 11:00 Nicholas Toth, Organizational Skills and Early Stone Age Sites  
 11:20 Douglas B. Bamforth, Settlement, Raw Material, and Lithic Procurement in the Central Mojave Desert  
 11:40 Robert L. Kelley, The Three Sides of a Biface

**(10) General Session: MIDWESTERN PREHISTORY: MIDDLE WOODLAND TO MISSISSIPPIAN**

Confederation 3  
 Chairperson: William I. Woods

**Participants**

- 10:10 William S. Dancy, The Murphy Site (33-Li-212): A Middle Woodland Settlement in Central Ohio  
 10:20 R.M. Farquhar, J.A. Walthall, and S.H. Stow, Lead Isotope Evidence for Mineral Deposit Sources of Galena from Some Middle Woodland and Mississippian Archaeological Sites in the Southeastern U.S.  
 10:40 William Green, A Prehistoric Frontier in the Prairie Peninsula: Late Woodland Upland Settlement and Subsistence Patterns  
 11:00 Tom Sussenbach and R. Barry Lewis, "Emergent Mississippian" and Its Paradigm: The Perspective from the Cairo Lowland  
 11:20 Duncan C. Wilkie, Research Update from Excavations at Towosahy State Historic Site  
 11:40 James M. Collins, George R. Holley and William I. Woods, New Data on an Old Enigma: The Second Terrace of Monks Mound

**THURSDAY AFTERNOON MAY 7, 1987**

**(9) Symposium: DIXIE CUPS AND CROWN JEWELS: ANALYTICAL APPROACHES TO THE ORGANIZATIONAL PROPERTIES OF STONE TOOL TECHNOLOGIES (CONT'D)**

Ballroom  
 Organizers and Chairpersons: Steven Kuhn and Signa Larralde

**Participants**

- 1:00 Signa Larralde, Planning Stone Tool Manufacture and Use in the Green River Basin: The Effect of Discrete Raw Material Attributes on Artifact Distributions  
 1:20 Julie E. Francis, Waste Not—Want Not? Organizational Aspects of Lithic Technological Systems in the Bighorn Mountains of Wyoming  
 1:40 M.L. Larson, Chipped Stone Debitage and the Organization of Technology  
 2:00 Robin Torrence, Stone Technology as Risk Management

- 2:20 Michael D. Wiant, Organizational Variability in Chipped Stone Assemblages, Part I: A Middle Woodland Case Study  
 2:40 Harold Hassen, Organizational Variability in Chipped Stone Assemblages, Part II: A Late Woodland Case Study  
 3:00 Patricia A. McAnany, From Family Heirloom to Metate Pecker: The Context of Biface Recycling Within an Entrenched Exchange System  
 3:20 Discussant: Lewis R. Binford

**(7) Symposium: THE ARCHAEOLOGY OF SOUTH ALASKA: SUBSTANTIVE AND THEORETICAL CONTRIBUTIONS (CONT'D)**

Confederation 456  
 Organizer and Chairperson: Richard H. Jordan

**Participants**

- 1:00 Philomena Knecht and Margaret J. Schoeninger, Reconstructing Prehistoric Diet/Subsistence on Kodiak Island Through an Analysis of Stable Isotope Ratios in Bone Collagen  
 1:20 Aron L. Crowell, The Regional Economy and Settlement Pattern of Northwestern Kodiak Island  
 1:40 M.E. Colleen Lazenby, The Ocean Bay Period of Occupation on Kodiak Island, Alaska  
 2:00 Richard H. Jordan, The Kachemak Cultural Tradition on Kodiak Island, Alaska  
 2:20 Richard Knecht, The Koniag: Ethnogenesis and Development of a Ranked Pacific Eskimo Society  
 2:40 Discussant: Frederica de Laguna

**(11) Symposium: THE FOREIGN RELATIONSHIPS OF TEOTIHUACAN**

Territories  
 Organizer and Chairperson: Michael W. Spence

**Participants**

- 1:00 Phil C. Weigand, Central Mexico's Influences in Jalisco and Nayarit During the Classic Period  
 1:20 Louise I. Paradis, Teotihuacan and Guerrero  
 1:40 Frederick J. Bove, Teotihuacan Impact on the Pacific Coast of Guatemala: Myth or Reality?  
 2:00 Clemency C. Coggins, Journey Into the Past: Teotihuacan in Mayaland  
 2:20 Hattula Moholy-Nagy, Teotihuacan Burials at Tikal, Guatemala  
 2:40 Tom W. Freer, Teotihuacan and Western Yucatan Exchange  
 3:00 Robert D. Drennan, Heinz Dehn and Philip T. Fitzgibbons, The Tehuacan Valley and the Teotihuacan Obsidian Industry  
 3:20 Evelyn C. Rattray, Circular Structures on the Gulf Coast and at Teotihuacan  
 3:40 Robert S. Santley, Teotihuacan Influence at Matacapán: Alternative Models and Inadequate Explanatory Frameworks  
 4:00 Discussant: William T. Sanders

**(12) General Session: HUNTER-GATHERER SUBSISTENCE, SETTLEMENT AND EXCHANGE**

Quebec  
 Chairperson: Laurie Cameron Steponaitis

**Participants**

- 1:00 Laurie Cameron Steponaitis, Declining Residential Mobility in the Lower Patuxent Drainage, Maryland  
 1:20 Charles W. Markman, Putney Landing (11 HE3): The Middle to Late Woodland Adaptive Transition in Northwest Illinois  
 1:40 Stephen C. Lensink, Resource Induced Migration in Central North America: The Case of the Soggy Marsh  
 2:00 Mark Q. Sutton, A Review of Optimal Foraging Theory in the Great Basin  
 2:20 Paul D. Bouey, The Evolution of Hunter-Gatherer Exchange Economies: Social Intensification in the North Coast Ranges of California  
 2:40 Richard L. Stromberg, Cache Point (NhTs-2) and MacKenzie Inuit Prehistory

- 3:00 James M. Savelle, Collectors to Foragers: Subsistence-Settlement System Change Amongst Arctic Hunter-Gatherers  
 3:20 Peter H. McCartney, Delayed Return Strategies and Hunter-Gatherer Settlement  
 3:40 Raymond Mauldin, An Ethnographic Overview of Hunter-Gatherer Subsistence

**(13) General Session: ANDEAN ICONOGRAPHY**

Alberta

Chairperson: Helaine Silverman

**Participants**

- 1:00 James A. Zeidler, Feline Mortars in Andean Ritual: New Evidence from Manabi Province, Ecuador  
 1:20 Jeffrey Quilter, Animated Objects in Moche Art  
 1:40 Martha B. Anders, Wamanga Pottery: Stylistic Innovation and Imitation in the Middle Horizon 2 Ceramics from the Planned Wari Site of Azangaro (Ayacucho, Peru)  
 1:50 Patrick H. Carmichael, Nasca Armed Conflict  
 2:10 Patricia J. Knobloch, The Nasca Legacy  
 2:30 Helaine Silverman, Is Nasca 8 Nasca?

**(14) Symposium: DESERT AND OASIS: HOLOCENE ARCHAEOLOGY OF THE WESTERN DESERT OF EGYPT**

Library

Organizers and Chairpersons: Fekri A. Hassan and Mary M.A. McDonald

**Participants**

- 1:00 Angela Close and Fred Wendorf, Holocene Archaeology in the Southern Western Desert  
 1:20 Maxine R. Kleindienst, Pleistocene Archaeology of the Dakhleh Oasis, Egypt: Background to the Holocene Adaptations  
 1:40 Herbert Haas, Holocene and Late Pleistocene Chronology in the Western Desert and the Nile Valley of Egypt  
 2:00 Ian A. Brookes, Holocene Sediments of Dakhleh Oasis, S.C. Egypt  
 2:20 J.C. Ritchie, Holocene Environments of the Eastern Sahara  
 2:40 Charles S. Churcher, Neolithic Faunas from Dakhleh Oasis, Western Desert of Egypt  
 3:00 Mary M.A. McDonald, Adaptations in Dakhleh Oasis in the Early- to Mid-Holocene  
 3:20 William P. McHugh, Holocene Cultural Adaptations in Southwestern Egypt  
 3:40 Anthony J. Mills, Historical Periods in the Dakhleh Oasis  
 4:00 D.L. Holmes, The Archaeology of Post-Palaeolithic Sites from Northern Kharga Oasis, Egypt  
 4:20 G. Timothy Gross and Fekri A. Hassan, Holocene Prehistoric Subsistence and Population in Siwa Oases  
 4:40 Robert J. Wenke, The Epipalaeolithic-Neolithic Transition in Egypt's Fayyum Oasis  
 5:00 Fekri A. Hassan, Interpreting Regional and Interregional Variability in the Holocene Archaeology of the Western Desert, Egypt

**(15) General Session: STUDIES IN TAPHONOMY**

British Columbia

Chairperson: L.A. Pavlish

**Participants**

- 1:00 A.V. Jopling, L.A. Pavlish and Z. Zhang, Selective Fluvial Transport of Stone and Bone: An Experimental Approach from Flume to Field  
 1:20 Jeanne M. Moe, The Effects of Trampling on Subsurface Assemblages: An Alywara Case Study  
 1:40 Thomas R. Whyte, An Experimental Study of Pit Feature Deposit Formation  
 2:00 D.M. Gurfinkle, Difficulties Associated with the Analysis of Organic Archaeological Residues  
 2:20 Victoria D. Horwitz, Experiments on Cooked Bone Breakage  
 2:30 Gary Haynes, Spiral Fractures, Flaked Bones, Cutmark Mimics, and Other Characteristics of Noncultural Elephant-Bone Accumulations in Africa

**(16) General Session: EUROPEAN PREHISTORY**

Confederation 3

Chairperson: Peter Bogucki

**Participants**

- 1:00 Philip G. Chase and Harold L. Dibble, Religion and Symbolism in the Middle Paleolithic: A Look at the Evidence  
 1:20 Todd A. Koetje, Pavement Features from the European Upper Paleolithic  
 1:40 Anta Montet-White, Grubgraben, a Gravettian Settlement in Lower Austria  
 2:00 Zilka Kujundžić and Robert Whallon, Palaeolithic-Mesolithic Investigations in South Bosnia-Herzegovina  
 2:20 Peter Sheppard, L.A. Pavlish and R.G.V. Hancock, Sourcing of Early Neolithic and Mesolithic Cherts and Rhyolites from Southern Portugal  
 2:40 William K. Barnett, The Physical Analyses of Impressed Pottery from Caldeirão and the Portuguese Early Neolithic  
 3:00 Peter Bogucki, Changing Adaptive Strategies and the Earliest Farming Communities of the North European Plain  
 3:20 Ernestine S. Elster, Studying Change at Sitagroi  
 3:40 Janet E. Levy, Danish Metallurgy in the Bronze Age  
 4:00 Robert M. Ehrenreich, The Introduction and Development of Iron Technology in Iron Age Britain

**(17) General Session: NORTHERN AND CENTRAL ANDES**

Alberta

Chairperson: M.A. Zeder

**Participants**

- 3:20 M.A. Zeder, Subsistence and Ideology in Coastal Ecuador  
 3:40 Coreen Chiswell, Network Analysis of Chimu Architecture  
 4:00 Jerry D. Moore, The Chimu Empire and Raised Field Agriculture in the Casma Valley, Peru  
 4:20 Gordon F. McEwan, The Significance of the Choquepukio Site in the Culture History of the Valley of Cuzco, Peru  
 4:40 Anita G. Cook, The Economic Dimensions of Andean Ritual in the Formation of Early Politics

**(18) Symposium: GOVERNMENT PROCESSES AND THE COAL INDUSTRY: CAN ARCHAEOLOGISTS ADAPT?**

British Columbia

Organizers and Chairpersons: Annetta L. Cheek and Mark A. Boster

**Participants**

- 3:00 Richard A. Boisvert, Conflict, Cooperation and Compliance: A Summary of Recent Archaeological Investigations in the Ohio Coal Fields  
 3:20 Cheryl Ann Munson and Charles M. Niquette, Lands Unsuitable for Mining, An Unsuitable Preservation Tool  
 3:40 Ruth A. Brinker, Cultural Resources in the Coal Fields of Indiana  
 4:00 James Wojtala and Shaune M. Skinner, Archaeology in Southeast Ohio: Recent Changes in the Data Base  
 4:20 David R. Bush, Cultural Resource Management Studies on Surface Mining Projects—Examples from Ohio and Kentucky  
 4:40 Annetta L. Cheek and Mark A. Boster, Coal Mining and Archaeology: OSMRE's View

**(19) General Session: EARLY MAN IN THE NEW WORLD**

Confederation 456

Chairperson: William N. Irving

**Participants**

- 3:40 William N. Irving, New Dates from Old Crow  
 4:00 Wilburn A. Cockrell, Warm Mineral Springs: Deep-Water Excavation at an 11,000 Year Old Site in Southwest Florida

- 4:20 William J. Mayer-Oakes and Alice W. Portnoy, A Study of the Early Man Lithic Assemblage from San Jose, Ecuador  
 4:40 Richard S. MacNeish, Early Man Finds from Mizque, Bolivia

### THURSDAY EVENING MAY 7, 1987

#### Reception: THE ROYAL ONTARIO MUSEUM AT 75

- 5:30 A reception for SAA members on the occasion of the ROM's 75th Anniversary. Museum to Galleries will be open to SAA members. Sponsored by the ROM, the Ontario Heritage Foundation, the Ontario Ministry of Citizenship and Culture, and the Society for American Archaeology  
 8:00 PM American Archaeology

#### Distinguished Lectures: HISTORY AND ARCHAEOLOGICAL THEORY

Ballroom  
 Organizers: Program Committee

#### Speakers

- 9:00 T. Cuyler Young, Jr., Since Herodotus, Has Prehistory Been A Valid Concept?  
 9:30 James Deetz, History and Archaeology: Walter Taylor Revisited

### FRIDAY MORNING MAY 8, 1987

#### (20) Symposium: HUNTER-GATHERERS AT THE LAST GLACIAL MAXIMUM: THE GLOBAL RECORD

Ballroom  
 Organizers and Chairpersons: Clive Gamble and Olga Soffer

#### Participants

- 8:00 John Parkington, The End of the Pleistocene in Southern Africa  
 8:20 Alison S. Brooks, Interior Africa: Central and Southern Africa at 18,000 B.P.  
 8:40 Fred Wendorf, Angela E. Close and Romuald Schild, North Africa During the Last Glacial Maximum  
 9:00 Harry R. Allen, Archaeology of the Murray-Darling River Basin, Australia, c. 18,000 B.P.  
 9:20 Rhys Jones, From Kakadu to Kutikina: Varied Responses at 18,000 B.P.  
 9:40 Chun Chen, The Sanshan Site: A Newly Discovered Upper Paleolithic Site on the East Coast of China  
 10:00 V. Jayaswal, Hunter-Gatherers of the Terminal Pleistocene in Uttar Pradesh, India  
 10:20 Robin Dennell, 18,000 B.P. in Pakistan and Central Asia  
 10:40 Richard S. Davis, Central Asian Hunter-Gatherers at the Last Glacial Maximum  
 11:00 Ofer Bar-Yosef, The Mediterranean Levant During the Last Glacial Maximum  
 11:20 G.N. Bailey and C. Gamble, Greece and the Balkans at 18,000 B.P.  
 11:40 Discussants: George Frison and Tjeerd H. van Andel

#### (21) Symposium: ECONOMY AND SOCIETY IN THE MEDIEVAL NORTH ATLANTIC

Alberta  
 Organizer and Chairperson: Thomas H. McGovern

#### Participants

- 8:00 Birgitta Wallace, L'Anse Aux Meadows, The Final Outpost  
 8:20 Karen Marie Christensen, Patterns of Land Use in Norse Greenland  
 8:40 Thomas H. McGovern, Trade and Subsistence in Norse Greenland

- 9:00 E. Paul Durrenburger, Economy and Law in Commonwealth Iceland  
 9:20 Gerald F. Bigelow, Taxation, Nutrition, and Trade: Island Economy in the Middle Ages  
 9:40 Discussant: Susan Kaplan

#### (22) General Session: EASTERN NORTH AMERICA

British Columbia  
 Chairperson: Joseph E. Granger

#### Participants

- 8:00 Lawrence Jackson, Heather McKillop, and Susan Wurtzburg, Folsom and Yuma Artifacts, 1934: A Challenge to Canadian Archaeology  
 8:20 James B. Peterson and Nathan D. Hamilton, The Piscataquis Archaeological Project: 1985 and 1986 Seasons  
 8:40 Jean-Francois Moreau, Maritime and Inland Archaic Adaptations in Mid-Eastern Quebec  
 9:00 David Rhode, Evolution of Sunflower, Sumpweed, and the Eastern Agricultural Complex  
 9:20 Stuart J. Fiedel, Algonquian Origins: A Problem in Linguistic-Archaeological Correlation  
 9:40 Joseph E. Granger, Meadowood Mortuary Activity: An Examination of Terminal Archaic/Early Woodland Death Ritual in the Lower Great Lakes

#### (23) Symposium: RADIOCARBON UPDATE: PROGRESS AND PROBLEMS IN RADIOCARBON DATING

Confederation 3  
 Organizer and Chairperson: Renee Kra

#### Participants

- 8:00 Roelf P. Beukens, Radiocarbon Dating with Accelerator Mass Spectrometry  
 8:20 Austin Long, A.T. Wilson, B.H. Gore, D.J. Donahue, A.J.T. Jull, and T.W. Linick, Bone Dating at the Arizona Tandem Mass Spectrometer Facility  
 8:40 R.E. Taylor, P.J. Slota, Jr., W. Henning, W. Kutschera and M. Paul, Radiocalcium (<sup>41</sup>Ca) Dating: Current Status and Potential Applications in Archaeology and Paleoanthropology  
 9:00 Erle Nelson, Accelerator Mass Spectrometry Radiocarbon Dating and Archaeology: Present and Future Impacts  
 9:20 F.E. Smiley, Old Wood and Early Agriculture in Northeastern Arizona: Approaches to the Interpretation of Radiocarbon Dates  
 9:40 R.G. Cresswell, Iron Comes of Age  
 10:00 Renee Kra, Solving Your Dating Problems with the New Radiocarbon Data Base Project  
 10:20 Minze Stuiver, A Discussion of Radiocarbon Age Calibration  
 10:40 Discussants: Frank Hole and Minze Stuiver

#### (24) Symposium: THE EFFECT OF VISIBILITY ON THE INTERPRETATION OF SETTLEMENT PATTERNS

Territories  
 Organizer and Chairperson: K. Anne Pyburn

#### Participants

- 8:20 Suzanne K. Fish, Paul Fish and John Madsen, Perception and Scale in the Evaluation of Dispersed Phenomena  
 8:40 Paul E. Reed and Steadman Upham, Limited Activity Sites and Low Visibility Remains  
 9:00 Arthur A. Joyce and Sissel Johannessen, The La Concha Ethnoarchaeological Study: A Preliminary Report  
 9:20 Charles Gordon Dean, Northern Honduran Subsistence Household Kitchens and Their Contents  
 9:40 Glen Davis Stone, The Imprint of One Culture On Two Landscapes  
 10:00 Claudia Chang, The Visibility of Pastoral Sites: An Ethnoarchaeological Case from Greece  
 10:20 Steven E. Falconer, Rural Visibility in "Urbanized" Societies: A Study of Growth Through Ruralization

- 10:40 K. Anne Pyburn, The Invisible Universe: Non-Platform Features in the Maya Lowlands  
 11:00 Discussants: Wendy Ashmore and Bennet Bronson

**(25) General Session: ARCHAEOZOOLOGY**

Library Chairperson: David R. Huelsbeck

**Participants**

- 8:20 David J. Rapson and Lawrence C. Todd, Attribute Based Spatial Analysis: An Example from a Hunter-Gatherer Site in Northwestern Wyoming  
 8:40 Diane K. Hanson, Subsistence Patterns During the Developed Coast Salish Phase on the Northwest Coast  
 9:00 Pamela J. Ford, Measuring Change in Shellfish Resources  
 9:20 Esmée Webb, Environmental Implications of Dietary Changes Observed on Holocene Aboriginal Shell Middens in New South Wales  
 9:40 Rachel J. Hamilton, The Archaeological Mollusca of Cerros, Belize  
 9:50 Beverly A. Smith, Dog Burials of Late Prehistoric Algonquian Sites in Northeastern Ontario  
 10:10 Kathryn M. Holland and C.G. Turner II, Prehistoric Aleutian Dogs  
 10:30 Virginia L. Butler, Inferring Site Function, Seasonality, and Butchering Patterns with Salmonid Remains  
 10:50 David R. Huelsbeck, Halibut Live Weight and Prehistoric Fisheries on the Olympic Peninsula  
 11:10 Sara L. Collins, Really Dead Birds: Human Prehistory and Avian Palaeontology in the Hawaiian Islands  
 11:30 Francisco Mena, Faunal Remains and Subsistence in Alero Entrada Baker, Central Patagonia  
 11:40 R. Lee Lyman, Applied Zooarchaeology

**(26) Symposium: AGRICULTURAL LAND-USE VARIABILITY IN THE PREHISTORIC AND HISTORIC SOUTHWEST**

Confederation 456

Organizers and Chairpersons: Robert W. Preucel and Sandra L. Marshall

**Participants**

- 9:00 Robert W. Preucel, The Pajarito Field House Project: Preliminary Results  
 9:20 Michael L. Elliott, Small Site ("Field House") Variability on the Southern Jemez Plateau, New Mexico  
 9:40 Anne I. Woosley, Agricultural Competition and Cooperation on the Taos Plateau  
 10:00 Sandra L. Marshall, Prehistoric Agriculture and Historic Pastoralism in the Middle Rio Grande Valley: A View from the Cooney Site  
 10:20 John D. Hays, Catchment Walls: Environmental Enhancement of a Volcanic Mesa Escarpment  
 10:40 Kurt F. Anschuetz and Timothy D. Maxwell, Agricultural Intensification and Diversification in the Northern Rio Grande  
 11:00 Rosalind Hunter-Anderson, The Changing Role of Small Structural Anasazi Sites in the Northern Rio Grande  
 11:20 Discussants: Shirley Powell and David R. Wilcox

**(27) Symposium: SITE STRUCTURE AND SPATIAL ORGANIZATION OF SEDENTARY COMMUNITIES**

Quebec

Organizers and Chairpersons: Philip J. Arnold III and Michael P. Smyth

**Participants**

- 9:00 Garth Bawden, Domestic Space and Social Organization in the Osmore Drainage of Southern Peru  
 9:20 Walter A. Dodd, Factors Conditioning the Placement of Fire-Related Facilities and Refuse  
 9:40 Michael P. Smyth, Site Structure and Spatial Organization: The Archaeology of Storage Behavior

- 10:00 Lee Home, Reading Village Plans  
 10:20 Michael Deal, Household Pottery Storage and Site Structure: A View from the Maya Highlands  
 10:40 Linda Mick-O'Hara, Distributional Analysis: An Attempt to Unravel Complexity in Puebloan Prehistory  
 11:00 Peter G. Roe and Peter E. Siegel, Village Spatial Organization in the South Amerindian Lowlands: Evidence from Ethnoarchaeology  
 11:20 Philip J. Arnold III, A Site Structural Approach to Modeling Ceramic Production  
 11:40 Discussants: Susan Kent and Michael B. Schiffer

**(28) Symposium: CURRENT ISSUES IN THE ARCHAEOLOGY OF THE NORTHERN ANDES**

Alberta Organizers and Chairpersons: Patricia J. Netherly and Karen E. Stothert

**Participants**

- 10:20 James B. Richardson III, The Archaeological Sequence and the Radiocarbon Chronology of the Chira Region of Northwest Peru  
 10:40 Thomas F. Aletto, Ecuadorian Chronology from the Gulf of Guayaquil  
 11:00 Patricia J. Netherly, Behind the Mangrove: Cultural Chronology and Settlement Pattern in the Arenillas Valley, Southeastern Coastal Ecuador  
 11:20 Alfred H. Siemens, Manipulation of Soil and Water in the Xeric Environments of Lowland El Oro, Ecuador  
 11:40 K.O. Bruhns, Long Distance Exchange in the Late Formative Ecuadorian Highlands

**(29) Symposium: THE MEANINGS OF CONSUMPTION: ONGOING RESEARCH IN HISTORICAL ARCHAEOLOGY**

British Columbia

Organizers and Chairpersons: Paul A. Shackel, Barbara J. Little and Margaret Purser

**Participants**

- 10:20 James Deetz, Afro-American Ceramic Production and Consumption in the Virginia Tidewater  
 10:40 Parker B. Potter, Jr., The Consumption of Ideas and the Production of Behavior: Past and Present in Annapolis, Maryland  
 11:00 Lynn Clark, Randall H. McGuire and LouAnn Wurst, Domination, Resistance and Meaning in the Cemetery  
 11:20 Stephen T. Driscoll, The Emergence of a Pictish Kingdom: Material Culture and Power  
 11:40 Steven Pendery, Pattern in Material Life in Colonial Charleston, Massachusetts

**FRIDAY AFTERNOON MAY 8, 1987**

**(20) Symposium: HUNTER-GATHERERS AT THE LAST GLACIAL MAXIMUM: THE GLOBAL RECORD (CONT'D)**

Ballroom

Organizers and Chairpersons: Clive Gamble and Olga Soffer

**Participants**

- 1:10 Andrei A. Velichko, Paleoenvironments on the Russian Plain at the Valdai Glacial Maximum  
 1:30 Olga Soffer, Hunter-Gatherers on the Russian Plain at 18,000 B.P.  
 1:50 Janusz K. Kozłowski, Northern Central Europe at ca. 18,000 B.P.  
 2:10 Jiří Svoboda, Czechoslovakia at the Second Würmian Pleniglacial: From the Middle Upper to the Late Upper Paleolithic  
 2:30 Gerd-C. Weniger, Germany at 18,000 B.P.  
 2:50 Marcel Otte, The Northwest European Plain at 18,000 B.P.  
 3:10 Françoise Audouze and Beatrice Schmider, Northern and Central France at 18,000 B.P.  
 3:30 Jean-Philippe Rigaud and Jan F. Simek, Prehistory of the Perigord Around the Last Glacial Maximum

- 3:50 Clive Gamble and João Zilhão, The Portuguese Solutrean—A New Appraisal  
 4:10 Lawrence G. Straus, The Last Glacial Maximum in Iberia: An Interregional Comparison  
 4:30 Discussants: H. Martin Wobst and Lewis R. Binford

**(30) General Session: PRECOLUMBIAN MEXICO: RECENT EXCAVATIONS AND ANALYSES**

Confederation 456  
 Chairperson: Michael E. Whalen

**Participants**

- 1:00 Charles D. Trombold, Recent Excavations in the La Quemada Region, Zacatecas, Mexico  
 1:10 R.B. Brown and L.F. Nieto G., San Miguel Viejo, Mpio. Allende, Guanajuato, Mexico  
 1:20 Charles C. Kolb, Classic Teotihuacan "Copoid Wares"—Ceramic Technological and Cultural Interpretations  
 1:40 Veronica M. Kann, Anthropomorphic Figurines as Ideological Practice: Teotihuacan Figurines at Matacapán, Veracruz, Mexico  
 2:00 Barbara A. Hall, Mesoamerican Textile Exchange and Spindle Whorls at Matacapán, Veracruz, Mexico  
 2:20 Michael E. Whalen, Small Community Organization During the Late Formative in Oaxaca, Mexico  
 2:40 Denise C. Hodges, Political Systems and Health Patterns in the Prehispanic Valley of Oaxaca, Mexico  
 3:00 Helen Perlstein Pollard, Tarascan Civilization Within Prehispanic Mesoamerica  
 3:20 Michael E. Smith, Community Organization at Two Late Postclassic Sites in Morelos, Mexico  
 3:40 John R. Triggs, A Quantitative Approach to the Reconstruction of Settlement Patterns in the Tehuacan Valley, Mexico  
 4:00 Marc Thompson, Mesoamerican Icons and Mimbres Mortuary Vessels

**(31) Symposium: LITHIC SOURCING AND PROCUREMENT STRATEGIES**

Territories  
 Organizers and Chairpersons: David J. Ives and Lucianne Lavin

**Participants**

- 1:00 Barbara E. Luedtke, Chert Source Determination: Getting Down to Basics  
 1:20 Peter Pagoulatos and Kathleen Furgerson, Terminal Archaic Lithic Procurement and Utilization: A View from the Connecticut River Valley  
 1:40 Barbara A. Calogero, Local Resource Selection — Connecticut Basalts  
 2:00 Lucianne Lavin, Prehistoric Procurement of Secondary Lithic Sources: The Case for Characterization  
 2:20 George P. Nicholas, Jasper Extraction and Thermal Modification Technologies, and Their Behavioral Implications in Southwestern New England  
 2:40 Kenneth B. Tankersley, In Search of Early Paleoindian Procurement Strategies in the Midwestern United States  
 3:00 David J. Ives, "Exotic" Cherts and the Hopewell Interaction Sphere  
 3:20 A.D. Darlington and Julie Francis, Cache and Carry: Lithic Procurement Strategies and Stone Caches in Northeastern Wyoming  
 3:40 Discussants: Ruthann Knudson and Cheryl Munson

**(32) General Session: ISSUES IN ARCHAEOLOGICAL THEORY**

Quebec  
 Chairperson: Douglas K. Charles

**Participants**

- 1:00 Raffael Cavallaro and Eric C. Gibson, The Scavenging Hypothesis Revisited, Or, Putting "Man" Back in Early Man Studies  
 1:20 Frances R. Pickin, Cultural Evolution and Allometric Growth  
 1:40 Charles Clifford Boyd, Cultural Selectionism and the Prehistory of Upper East Tennessee and Adjacent Regions  
 2:00 Aubrey Cannon, The Temporal Dimension in the Analysis of Style

- 2:20 Douglas K. Charles, A Theory of Archaeology and the Burden of History  
 2:40 Judith Habicht-Mauche, John Hoopes and Michael Geselowitz, Where's the Chief?: The Archaeology of Complex Tribes  
 3:00 Izumi Shimada and John Merkel, Sican Metallurgy: "Holistic" Understanding and the Role of Archaeometry  
 3:20 David J. Killick, A Technology in Its Social Setting: Historic Iron Smelting in Central Malawi, East Africa  
 3:30 Neil A.R. Lang, Mortuary Analysis, Its Uses and Abuses: Some Examples from the Iron Age of North West Europe  
 3:50 D. Arnold, Cultural Process and Changes in Ceramic Technology in Ticul, Yucatan, Mexico

**(28) Symposium: CURRENT ISSUES IN THE ARCHAEOLOGY OF THE NORTHERN ANDES (CONT'D)**

Alberta

Organizers and Chairpersons: Patricia J. Netherly and Karen E. Stothert

**Participants**

- 1:00 Ann M. Mester, Pattern Burnished Ceramics from a Manteno Trading Center  
 1:20 Maria A. Massucci, Inland-Coastal Interaction: Evidence of Guangala Phase Inland Subsistence Patterns from El Azucar, Ecuador  
 1:30 Paul Tolstoy, Investigations in the Basin of the Rivers Santiago and Cayapas, Esmeraldas, Ecuador  
 1:50 Ronald D. Lippi, The Western Pichincha Project: Survey and Excavations in Ecuador's Western Montana 2:10 J. Stephen Athens, Ethnicity and Adaptation: Prehistory in Northern Highland Ecuador  
 2:30 Gregory Knapp, Irrigation and Culture History in the Equatorial Andes  
 2:50 Mathilde Temme, Characteristics and Inter-regional Linkage of Prehistoric Settlement Remains of Putushio (Southern Ecuador)  
 3:10 John E. Staller, A Contextual Analysis of a Valdivia House Structure at OGSE-Ch-150  
 3:20 Discussants: Allison C. Paulsen and J. Scott Raymond

**(33) Symposium: PROBLEMS IN ONTARIO PREHISTORY**

Library

Organizer and Chairperson: Martha B. Latta

**Participants**

- 1:00 Ronald F. Williamson, Early Iroquoians: People in Transition  
 1:20 Peter Reid, Models for Prehistoric Exchange: Southwestern Ontario and Southern Michigan  
 1:40 Robert Pihl, New Perspectives on Point Peninsula Middle Woodland in Eastern Ontario  
 2:00 Rodolphe David Fecteau, Late Woodland Cultivated Plant Record in Southern Ontario  
 2:20 H. Bruce Schroeder, Problems and Prospects for Research into the Later Archaic of Southern Ontario  
 2:40 Martha B. Latta, An Historical Overview of Ontario Prehistory

**(29) Symposium: THE MEANINGS OF CONSUMPTION: ONGOING RESEARCH IN HISTORICAL ARCHAEOLOGY (CONT'D)**

British Columbia

Organizers and Chairpersons: Paul A. Shackel, Barbara J. Little and Margaret Pursler

**Participants**

- 1:00 Paul A. Shackel, The Archaeology of Manners  
 1:20 Margaret Pursler, Material Culture and the Study of Consumption in Nineteenth Century Paradise Valley, Nevada  
 1:40 Barbara J. Little, The Authorities of Media: Print Culture and Material Culture in the Colony and State of Maryland  
 2:00 Discussants: James Deetz and Mark P. Leone

**(34) General Session: SPATIAL ANALYSES**

Confederation 3

Chairperson: Peter W. Stahl

**Participants**

- 1:00 Nina M. Versaggi, Diversity in Hunter-Gatherer Settlements in the Susquehanna Valley of New York
- 1:20 R.W.C. Burgar, The Spatial Organization of the Batten Kill Phase in Southern Ontario
- 1:40 Nathan D. Hamilton, The Nevin Site: Reconstructing Subsistence Patterns and Activity Areas
- 2:00 Nancy R. Coinman and Geoffrey A. Clark, Aspects of Structure in Late Pleistocene (Epipaleolithic) Occupation Sites in West-Central Jordan
- 2:20 Peter W. Stahl and James A. Zeidler, Spatial Analysis and Taphonomy of Vertebrate Fauna from Early Formative Domestic Structures at Real Alto, Ecuador
- 2:40 Jon S. Czaplicki and John C. Ravesloot, Determining Subsurface Site Boundaries at Hohokam Sites by Intensive Transect Recording
- 3:00 P. Nick Kardulias, Geophysical Examination of the Byzantine Fortress at Isthmia, Greece
- 3:10 Richard S. Sleeter, Exploration of Cultural Interaction: A Study of Settlement Patterns in the Gallina Region of Northwestern New Mexico
- 3:30 Robert D. Leonard and Roger Anyon, Comparable Sampling of Varied Landforms in the Regional Survey
- 3:50 Charles F. Merbs and Judy L. Brunson, Burial Orientation and Afterlife: A Comparison of Models from the American Southwest and the Canadian Arctic

**(35) Symposium: APPROACHES TO DATING NORTH AMERICAN ROCK ART**

British Columbia

Organizer and Chairperson: Thor Conway

**Participants**

- 3:00 Ian N.M. Wainwright, Observations of the Structure and Deterioration of Rock Art Sites in Canada
- 3:20 Ronald Dorn and David S. Whitley, Cation Ratio Dating and Rock Art Chronology in the Western Great Basin
- 3:40 Charles Cleland and Thor Conway, Dating Algonkian Rock Art Through Ethnography, Geomorphology and Archaeology
- 4:00 Doris Lundy, The Rock Art of British Columbia: A Chronological Review
- 4:20 Robert J. Salzer, Cultural and Temporal Contexts of the Gottschall Rock Art Site
- 4:40 Discussant: James Swauger

**FRIDAY EVENING MAY 8, 1987****SOCIETY FOR AMERICAN ARCHAEOLOGY**

5:30- Annual Business Meeting

7:30PM Ballroom

**SATURDAY MORNING MAY 9, 1987****(36) General Session: IROQUOIS SETTLEMENT AND DEMOGRAPHY**

Quebec

Chairperson: Dean R. Snow

**Participants**

- 8:00 Dean R. Snow, Variables and Constants in Iroquoian Settlement Patterns
- 8:20 William D. Finlayson and David G. Smith, Iroquoian Culture History, Settlement and Demography in the Crawford Lake Region of Southern Ontario
- 8:40 M.L. Sempowski, L.P. Saunders and G.C. Cervone, The Early Historic Seneca: Settlement Patterns and Demographic Trends

- 9:00 Gary A. Warrick, Estimating Ontario Iroquoian Village Duration
- 9:20 Mary Ann Niemczyk, Demographic Change and the Evolution of Iroquois Culture in West-Central New York
- 9:40 Dean H. Knight, Morphology of a 17th Century Huron Village
- 10:00 Wm. C. Noble, Historic Iroquois Settlements of the Ontario-Niagara Frontier Region

**(37) General Session: CARIBBEAN ARCHAEOLOGY**

Library

Chairperson: William F. Keegan

**Participants**

- 8:00 David J. Bernstein and Peter E. Siegel, Site Structure, Settlement Organization, and Sampling: A Case Study from the North Coast of Puerto Rico
- 8:10 Bruce K. Nodine, The Antillean Ceramic: Preliminary Results from a Survey of Sites on Antigua, West Indies
- 8:30 William F. Keegan, Structural Determinants of Lucayan Arawak Settlement Patterns
- 8:50 Samuel M. Wilson, Recent Research on Nevis, West Indies

**(38) Symposium: BEYOND COUNTS, CATALOGS AND CHRONOLOGIES: NEW DIRECTIONS IN ROCK ART RESEARCH**

British Columbia

Organizers and Chairpersons: David S. Whitley and Christopher Chippindale

**Participants**

- 8:00 Christopher Chippindale, What's It a Picture of? Identifying Prehistoric Pictures in the Southern Alps
- 8:20 Jay F. Custer, Patterns in Petroglyphs and in Ceramics of the Lower Susquehanna Valley, Delaware
- 8:40 Knut Helskog, Changing Rock Art, Changing Society? The Case of the Stone Age Fisher-Hunter-Gatherers of Arctic Norway
- 9:00 David S. Whitley, Ethnography of Communication and Rock Art Study in the Active Voice
- 9:20 Tamara Koteles McAuley, Low Art in High Culture: A Reanalysis of the Tikal "Graffiti"
- 9:40 Larry Loendorf, Topophilia and Rock Art in the Northwest Plains
- 10:00 Megan Biescle, Oral Learning and the Interpretation of Rock Art
- 10:20 David Lewis-Williams, The Signs of All Times: Entopic Phenomena in Rock Art
- 10:40 Royden J. Yates, Anthony M. Manhire and John Parkington, Ethnography, Archaeology and Rock Engraving in the Western Cape, Southern Africa
- 11:00 Janette Deacon, Ethnohistory and Southern San Rock Engravings
- 11:20 Thor Conway, Shamanic Rituals and the Interpretation of Ojibwa Rock Art
- 11:40 James Sackett, Beyond Time-Place Systematics in Rock Art Research: A Synthetic View
- 12:00 Discussant: David Hurst Thomas

**(39) General Session: COMPUTER APPLICATIONS**

Confederation 3

Chairperson: Mitchell T. Mulholland

**Participants**

- 8:00 Mitchell T. Mulholland, Information Flow in Archaeological Data Management
- 8:20 Harold L. Dibble, The La Quina Computer Data System
- 8:30 Paul Reilly, Looking at the Past Using Advanced Graphics Systems
- 8:50 Kathryn M. Cleland, Dwight W. Read and Izumi Shimada, Applications of Digitizing to Analysis of Ceramics from Huaca del Pueblo Batan Grande, Peru

**(40) Symposium: EXCHANGE SYSTEMS IN NORTH AMERICA: CONNECTIONS AND INTERFACES**

Ballroom

Organizers and Chairpersons: Timothy G. Baugh and Jonathon E. Ericson



**Participants**

- 8:45 David J. Meltzer, Were There Exchange Systems Among North American Paleo-Indians?  
 9:00 Roy L. Carlson, Prehistoric Exchange on the Northwest Coast  
 9:15 Jonathon E. Ericson, Chester King and Clay Singer, Exchange and Epidemics Among California Aboriginal Populations  
 9:30 Frank W. Eddy, Some Thoughts on Exchange Relationships During the Glaze Period of the Galisteo Basin, Northern New Mexico  
 9:45 Randall H. McGuire, The Structure and Organization of Hohokam Exchange  
 10:00 Ronna J. Bradley, Marine Shell Ornament Production at Casa Grandes, Chihuahua: The Role of Shell in Exchange Systems in Northwest Mexico and the Southwest  
 10:15 Daniel T. Reff, Contact Shock and the Routes of Contagion During the Early Historic Period in the Greater Southwest  
 10:30 Garman Harbottle and Phil C. Weigand, Turquoise in the Ancient Mesoamerican Trade Structure  
 10:45 Christopher A. Pool and Robert S. Santley, Connections and Interfaces Between Production—Distribution Systems in Highland Mexico and on the Gulf Coast  
 11:00 Harry J. Shafer and Patricia A. McAnany, Patterns of Production and Consumption: A Stone Tool Exchange Network from the Eastern Maya Lowlands  
 11:15 Payson D. Sheets, Economies of Dependency or Self-Sufficiency in El Salvador and Costa Rica  
 11:30 Discussants: Cynthia Irwin-Williams and Jeremy A. Sabloff

**(41) Symposium: PROVINCIAL INKA: PROBLEMS AND MEANS OF IDENTIFICATION**

Alberta

Organizer and Chairperson: Michael A. Malpass

**Participants**

- 8:40 Theresa Lange Topic, The Late Horizon in Huamachuco  
 9:00 Sue Grosboll, "... And He Said in the Time of the Ynga, They Paid Tribute & Served the Ynga."  
 9:20 Susan A. Niles, The Provinces in the Heartland: Stylistic Variation and Architectural Innovation Near Inca Cuzco  
 9:40 Katharina J. Schreiber, The Inka Occupation of the Province of Lucanas, Peru  
 10:00 Geoffrey E. Spurling, Qolla Potters Making Inka Pottery: Ceramic Production at Milliraya  
 10:20 Michael A. Malpass, Inka Occupation of the Colca Valley, Peru  
 10:40 Thomas F. Lynch, Searching for the Inkas at Catarpe Tambo and Related Sites in the Chilean Atacama  
 11:00 Lautaro Núñez Atencio, Ocupación Inka en el territorio atacameño [Norte de Chile]  
 11:20 Mario A. Rivera, Inca Strategies of Occupation in Northern Chile  
 11:40 Discussant: Donald Thompson

**(42) Symposium: THE GARDENS OF PREHISTORY: A LOOK AT CULTIVATION NEAR THE RESIDENCE FROM THE PERSPECTIVE OF THE ARCHAEOLOGIST**

Territories

Organizer and Chairperson: Thomas W. Killion

**Participants**

- 9:00 Timothy D. Maxwell and Kurt F. Anschuetz, Variability in Garden Plot Locations in the Lower Rio Chama Valley, New Mexico  
 9:20 William E. Doolittle, Survey Evidence of Dooryard Gardens in the Southwest  
 9:40 Ponciano Ortiz Ceballos, The Archaeological Record as an Indicator of Household Gardening Strategies in Prehistoric Mesoamerica  
 10:00 Thomas W. Killion, The Use of Space Around the Residence by the Ancient Farmers of the Gulf Coast: Recent Research from the Site of Matacapán, Veracruz, Mexico  
 10:20 Donna M. McAnany, Garbage and Gardens: The Dynamics of Stone Tool Discard Near Residences  
 10:40 Peter H. Herlihy and Frederick M. Wiseman, The Maya Dooryard Orchard-Garden

- 11:00 Christian J. Zier, Residential Agriculture in a Post-Eruption Environment, El Salvador  
 11:20 Robert Eidt, A New Method for Identifying Anthrosols with Special Reference to Garden Soils  
 11:40 Discussants: B.L. Turner II and William T. Sanders

**(43) General Session: METHODS OF ARCHAEOLOGICAL RESEARCH AND ANALYSIS**

Confederation 3

Chairperson: James Schoenwetter

**Participants**

- 9:30 James Schoenwetter, The Logic of Archaeological Pollen Analysis  
 9:50 A.C. D'Andrea, Limitations on the Interpretation of Archaeological Wood Charcoal  
 10:10 Rinita A. Dalan, Julie K. Stein, John M. Musser, Jr. and Clyde A. Ringstad, Archaeo-Geophysics and Coring: A Partnership That Works  
 10:30 Frank J. Vento and Phillip T. Fitzgibbons, Holocene Age Paleosol Development and Archaeological Site Location  
 10:50 Robert C. Dunnell, Measurement and Archaeological Use of Sediment pH  
 11:10 K.M. Wilson Yang, J.E. Smeaton, K.M. Matsui, L. Bond and G. Burns, Archaeological Sites as Chemical Systems  
 11:30 Richalene G. Kelsay, Jennifer T. Taschek and Joseph W. Ball, Intrasettlement Space-Utilization and Residual Soil Phosphate Levels in the Upper Belize Valley, Central America  
 11:50 James I. Ebert, Eileen L. Camilli, and LuAnn Wandsnider, Recent Erosion of Sites on the Middle Missouri River

**(44) Symposium: THE INTERPRETATION OF SPATIAL PATTERNS WITHIN STONE AGE ARCHAEOLOGICAL SITES**

Confederation 456

Organizers and Chairpersons: Ellen M. Kroll and T. Douglas Price

**Participants**

- 9:30 Ellen M. Kroll and T. Douglas Price, Introduction  
 9:40 Susan Kent, The Relationship Between Anticipated Mobility Strategies and Site Structure  
 10:00 J.F. O'Connell, K. Hawkes and N.B. Jones, Hadza Site Structures: An Ethnographic Overview  
 10:20 Laurence E. Bartram, Ellen M. Kroll and Henry T. Bunn, Variability in Camp Structure and Food Refuse Patterning at Kua San Hunter-Gatherer Camps  
 10:40 Brian Hayden and Rob Gargett, Spatial Structure in Australian Hunter/Gatherer Campsites  
 11:00 John E. Yellen, The Effect of Non-Human Predators on Intra-Site Spatial Organization  
 11:20 Keith W. Kintigh, Susan Gregg, and Robert Whallon, Linking Ethnoarchaeological Interpretation and Archaeological Data: The Sensitivity of Spatial Analysis Methods to Post-Depositional Disturbance  
 11:40 Discussant: Michael B. Schiffer

**(45) General Session: THE MAYA REGION: STRATEGIES AND SYNTHESSES**

Library

Chairperson: Grant D. Jones

**Participants**

- 9:50 Michael Blake and John E. Clark, Barra, Oco's, and Early Olmec Societies of Coastal Chiapas, Mexico  
 10:00 Olivier de Montmollin, Shifting Spatial Scales in Studies of Maya Settlement and Politics  
 10:20 Eric C. Gibson, The Origin of Maya Ceremonial Lithic Artifacts  
 10:40 Richard M. Leventhal, Southern Belize: The Development of a Maya Region  
 11:00 Peter S. Dunham, Gravity Analysis and Settlement Boundaries: Intercenter Interaction in Southern Belize

- 11:20 James J. Sheehy, Ethnographic Analogy and the Copaneco Royal Household  
 11:40 Grant D. Jones, David M. Pendergast and Elizabeth A. Graham, Locating the Maya Towns of Spanish Colonial Belize: Ethnohistorical and Archaeological Strategies

### SATURDAY AFTERNOON MAY 9, 1987

#### (40) Symposium: EXCHANGE SYSTEMS IN NORTH AMERICA: CONNECTIONS AND INTERFACES (CONT'D)

Ballroom  
 Organizers and Chairpersons: Timothy G. Baugh and Jonathon E. Ericson

##### Participants

- 1:00 Cheryl Claassen, Uncovering Trade Routes for Shells  
 1:15 Christopher L. Nagle, Inuit and Paleo-Eskimo Raw Materials Procurement and Exchange in the Eastern Canadian Arctic: System Structure and Implications for Studies of Other Egalitarian Societies  
 1:30 Bruce J. Bourque, Exchange Patterns in Northeastern North America  
 1:45 Neal L. Trubowitz, New Goods on Old Routes: Exchange in the Contact Era in Eastern North America  
 2:00 Jay K. Johnson and Samuel O. Brookes, Benton Points, Turkey Tails and Cache Blades: Middle Archaic Exchange in the Southeast  
 2:15 Jon L. Gibson, Poverty Point Trade and the Archaic-Woodland Transition  
 2:30 Marvin T. Smith, Early Historic Period Trade in the Interior Southeast  
 2:45 Ann F. Ramenofsky, Diffusion of Disease at European Contact  
 3:00 Timothy G. Baugh and Fred W. Nelson, Exchange and Obsidian: Changing Trade Structures in the Southern Plains  
 3:15 S.C. Vehik, Late Prehistoric Exchange on the Southern Plains  
 3:30 J. Daniel Rogers, The Social Role of Commodities: An Archaeology of Arikara Trade  
 3:45 Dennis L. Toom, The Role of Plains Villagers in the Post-Contact Middle Missouri Trade System of the Northern Plains  
 4:00 Discussants: James B. Griffin and Jerald T. Milanich

#### (44) Symposium: THE INTERPRETATION OF SPATIAL PATTERNS WITHIN STONE AGE ARCHAEOLOGICAL SITES (CONT'D)

Confederation 456  
 Organizers and Chairpersons: Ellen M. Kroll and T. Douglas Price

##### Participants

- 1:00 Marc G. Stevenson, What Now! Beyond the Formation of Hearth Associated Lithic Distributions  
 1:20 H.P. Blankholm, Towards a Behavioural Interpretation of Early Post-Glacial Hunter-Gatherer Sites in Southern Scandinavia  
 1:40 Daniel Cahen, Spatial Organization of the LBK Village of Darion (Belgium)  
 2:00 Lawrence Keeley, Lithic Production and Use: Implications for Spatial Analysis  
 2:20 Ian Johnson, Recovery and Classification as a Determinant of Interpretation  
 2:40 Christopher Carr, Interpreting Artifact Clusters Around Hearths at Pincevent Habitation No. 1  
 3:00 Jan F. Simek and Jean-Philippe Rigaud, Site Formation at the Abri Vaufray (Dordogne, France)  
 3:20 H. Hietala, Changes in Social Organization at the Middle Paleolithic Transition Site at Boker Tachtit  
 3:40 Ellen M. Kroll, Help, No Hearths: Interpreting Plio-Pleistocene Intrasite Spatial Patterns  
 4:00 Discussant: Robert Whallon

#### (46) Symposium: EASTERN PALEO-INDIAN LITHIC RESOURCE UTILIZATION

Territories  
 Organizers and Chairpersons: Jonathan C. Lothrop and Chris J. Ellis

##### Participants

- 1:00 Peter L. Storck and Peter von Bitter, Implications of the Geological Age and Occurrence of Fossil Hill Formation Chert for Early Paleo-Indian Settlement Patterns in Southern Ontario  
 1:20 D. Brian Deller, Great Lakes Paleo-Indian: Interpretation of Chert Utilization Patterns in the Parkhill Complex  
 1:40 L.A. Pavlish, To Heat or Not to Heat, That Is the Question!  
 2:00 P.J. Julig, L.A. Pavlish and R.G.V. Hancock, Late Paleoindian Lithic Procurement, Reduction and Transport in the North-Western Lake Superior Region, Canada  
 2:20 Arthur E. Spiess, Deborah Brush and John R. Grimes, Patterning in Paleoindian Behavior: The Michaud Site  
 2:40 Chris J. Ellis, The Explanation of Eastern Paleo-Indian Lithic Procurement Patterns  
 3:00 Kurt W. Carr, The Role of Quarry Utilization in Paleoindian Settlement Patterns  
 3:20 I. Randolph Daniel, Jr., The Organization of a Suwannee Technology: The View from Hamey Flats  
 3:40 Johathan C. Lothrop, Paleo-Indian Lithic Raw Material Management in the Northeast  
 4:00 Michael Shott, Technological Organization in Great Lakes Paleo-Indian Assemblages  
 4:20 Discussants: Albert C. Goodyear and Henry T. Wright III

#### (47) Symposium: COASTAL MAYA TRADE AND EXCHANGE

Quebec  
 Organizer and Chairperson: Heather I. McKillop

##### Participants

- 1:00 Heather I. McKillop, Introduction  
 1:10 Diane Z. Chase and Arlen F. Chase, Routes of Trade and Communication and the Integration of Maya Society: The Vista from Santa Rita Corozal, Belize  
 1:30 Meredith Dreiss, An Obsidian Distribution Model for the Belize Periphery  
 1:50 Rafael Cobos, Shelling In: Marine Mollusca at Chichen Itza  
 2:10 Anthony P. Andrews, A Typology of Maya Trading Ports  
 2:30 J. Jefferson MacKinnon, Coastal Maya Trade Routes in Southern Belize  
 2:50 Heather McKillop and Lawrence Jackson, Defining Coastal Maya Trade Stations and Transportation Routes  
 3:10 Matthew Bost, Sarteneja, Belize and the Maya Postclassic  
 3:30 Elizabeth A. Graham, A Brief Synthesis of Coastal Site Data from Colson Point, Placencia, and Marco Gonzalez, Belize  
 3:50 Thomas H. Guderjan, James F. Garber and Herman A. Smith, Maya Transshipment Points and Facilities on Northern Ambergris Cay, Belize  
 4:10 Discussant: Paul F. Healy

#### (48) Symposium: DEMOGRAPHY, PRODUCTION, AND EXCHANGE IN THE EVOLUTION OF COMPLEX SOCIAL ORGANIZATION IN LATE PREHISTORIC EUROPE

Alberta  
 Organizers and Chairpersons: D. Blair Gibson and Michael N. Geselowitz

##### Participants

- 1:00 Carole L. Crumley, Toward a Definition of Complexity: Some Burgundian Puzzles  
 1:20 Stephen Dyson, The Rise of Complex Societies in Italy: Historical Versus Non-Historical Perspectives  
 1:40 Bettina Arnold, Slavery in Late Prehistoric Europe: Recovering the Evidence for Social Structure in Iron Age Society  
 2:00 Matthew L. Murray and Margaret J. Schoeninger, Diet, Status and the Emergence of Complex Social Structure in Iron Age Central Europe: Some Contributions of Bone Chemistry  
 2:20 Discussant: Bernard Wailes  
 2:40 Janusz Ostojka-Zagorski, Demographic and Economic Changes in the Hallstatt Period of the Lusatian Culture  
 3:00 D. Blair Gibson, Agro-Pastoralism and Regional Social Organization in Late Iron Age Western Ireland  
 3:20 Michael N. Geselowitz, The Development of Ironworking Technology and the Rise of Social Complexity in Iron Age Central Europe

- 3:40 Kathleen Biddick, *People and Things: Territorializing Social Reproduction in Early European Development*  
 4:00 Klavs Randsborg, *The Town, the Power and the Land: Europe and Denmark in the First Millennium A.D.*  
 4:20 Discussant: Peter S. Wells

**(49) General Session: SOUTHERN ANDES**

Library  
 Chairperson: Geoffrey W. Conrad

**Participants**

- 1:00 Calogero M. Santoro, *Transhumance Patterns in the South Central Andes*  
 1:10 Donald L. Brockington, David Pereira, Ramon Sanzenteña, and Ricardo Cespedes, *A Preliminary Report on Formative Ceramic Sequences in Cochabamba, Bolivia*  
 1:30 Katherine M. Moore and Margaret J. Schoeninger, *Quantitative Reconstruction of Prehistoric Diet in Peru*  
 1:40 Lawrence A. Kuznar, *Asana: A Deeply Stratified, Open-Air Archaic Period Site in the South Central Andean Highlands*  
 2:00 Francis A. Riddell, *Archaeological Research on the South Coast of Peru*  
 2:20 R.W. Robinson, *Hacha: A Late Initial Period Site on the South Coast of Peru*  
 2:40 Jonathan D. Kent, *Ground Figures and Roads in Acari, Peru*  
 3:00 Christopher L. Borstel, Keith P. Jacobi and Geoffrey W. Conrad, *San Antonio: Analysis of the Exposed Architecture at an Estuquina Phase Site, Moquegua, Peru*

**(50) General Session: CERAMIC ANALYSIS**

British Columbia  
 Chairperson: Karen D. Vitelli

**Participants**

- 1:00 Melissa B. Hagstrum, *An Ethnoarchaeological Study of Ceramic Use-Life, Breakage, and Discard in the Central Andes, Peru*  
 1:20 W. Longacre, K. Kvamme and M. Kobayashi, *Pottery Standardization: Ethnoarchaeological Studies from the Philippines*  
 1:40 Robert C. Henrickson, *Pottery Production and Consumption in an Iranian Bronze Age Town*  
 2:00 Carole A. Stimmell, *Changes in Prehistoric Ceramic Production Technology in the North American Arctic*  
 2:20 Patricia L. Crown and Ronald L. Bishop, *Convergence in Ceramic Manufacturing Traditions in the Late Prehistoric Southwest*  
 2:40 Robert B. Mason, *Petrographic Analysis of Pottery from R.O.M. Fieldwork in the Near East*  
 3:00 Patrice A. Teltser, *Chronological Implications of Ceramic Paste Variability in Middle Mississippi Ceramics from Southeast Missouri*  
 3:20 Elizabeth F. Henrickson, *Identifying the Function of an Abundant, Enigmatic Vessel Type from an Iranian Chalcolithic Farming Village*  
 3:30 Patricia A. Gilman, *Changing Subsistence and the Role of Ceramics*  
 3:50 Barbara J. Mills, *Vessels vs. Sherds: An Interpretive Dichotomy*  
 4:10 H.W. Jarvis, *INAA Provides Evidence of Efficient Pottery Making Technology at the Keffer Site, Ontario, Canada*  
 4:30 Karen D. Vitelli, Kenneth B. Tankersley, and Nelson R. Shaffer, *More Problems with Archaeometric Sourcing of Archaeological Ceramics*  
 4:50 James M. Skibo and Michael B. Schiffer, *Organic-Tempered Pottery: An Experimental Study*

**(51) General Session: GREAT BASIN AND SOUTHWEST**

Confederation 3  
 Chairperson: John M. Andresen

**Participants**

- 1:00 J.M. Adovasio, R.L. Andrews and Ronald C. Carlisle, *New Evidence for the Diffusion of the Numic Speakers in the Great Basin*

- 1:20 Michael G. Delacorte, *The Role of Marriage Networks in Structuring Great Basin Settlement Patterns*  
 1:40 Lonnie C. Pippin, *Modeling the Formation of Temporary Camps and Other Site Types in the Archaeological Record of the Nevada Test Site, Southern Nye County, Nevada*  
 2:00 Robert P. Power, *The View from the Outside: Archeological Survey on the Peripheries of Chaco Canyon*  
 2:20 Deborah L. Nichols, *Changing Community Patterns and Intensification of Social Networks During the Basketmaker-Pueblo Transition on Northern Black Mesa, Arizona*  
 2:40 Thomas R. Rocek, *Economy, Demography, and Social Change: The Navajos of Northern Black Mesa*  
 3:00 John M. Andresen, *Classic Period Hohokam Group Structure*  
 3:20 Douglas B. Craig, *The Hohokam Colonial Expansion: A Tucson Basin Perspective*  
 3:40 Amy A. Douglass, *Exploring Prehistoric Southwestern Ceramic Exchange: Little Colorado Whiteware Distributions and EDA*  
 4:00 Nancy D. Sharp, *Resource Selection in Developing Agricultural Systems*

**(52) Symposium: TIWANAKU AND ITS HINTERLAND: RECENT RESEARCH IN THE TITICACA BASIN OF BOLIVIA**

Library  
 Organizer: Gray Graffam  
 Chairperson: Alan L. Kolata

**Participants**

- 3:30 Alan L. Kolata, *Proyecto Wila Jawira: An Introduction to Goals, Methods, and Results*  
 3:45 Charles Stanish, *Size and Complexity in Core Area Tiwanaku Settlements*  
 4:00 Marc Bermann, *Domestic Occupation at a Regional Tiwanaku Site*  
 4:15 Oswaldo Rivera Sundt, *Excavations in the Sector of Wilakollu at Lukurmata, Bolivia*  
 4:30 Gray Graffam, *Tiwanaku Intensive Agriculture: Evidence of Raised Field Cultivation from Lukurmata, Bolivia*  
 4:45 Michael W. Binford, Mark Brenner and Barbara Leyden, *Preliminary Studies of Tiwanaku Limnology*  
 5:00 Charles Orloff, *A Thermo-hydrological Analysis of Raised Fields in the Tiwanaku Hinterland*  
 5:15 Discussants: Thomas F. Lynch and Mario Rivera

**SUNDAY MORNING MAY 10, 1987****(53) Workshop: SAS INTERFACES '87: MICROSCOPY FOR THE ARCHAEOLOGIST**

Canadian Organizer and Chairperson: Jonathon E. Ericson

**Participants**

- 8:00 Jonathon E. Ericson, *Introduction*  
 8:10 Fred Wiseman, *Archaeological Pollen Analysis*  
 8:40 George Rapp, Jr. and Susan C. Mulholland, *Phytolith Analysis in Archaeology*  
 9:10 Cheryl Claassen, *Shellfishing Seasonality: Problems of Recognizing Annulae*  
 9:40 Break  
 9:50 Michael L. Wayman, *Optical Metallography: Metal Artifacts Through the Looking Glass*  
 10:20 Break  
 10:30 Suzanne P. DeAtley, *Ceramic Technology Revealed Through Microscopy*  
 11:00 Sarah Berry and D.B. Bamforth, *Microwear Analysis in the 1980's*  
 11:30 Christopher M. Stevenson, *Methods of Obsidian Hydration Rim Enhancement and Measurement*

**(54) Symposium: CULTURAL RESOURCE MANAGEMENT AT THE CROSSROADS: ASSESSING THE PAST AND PLANNING THE FUTURE**

Tudor 789  
 Organizers and Chairpersons: Renata B. Wolyneec and Joseph A. Tainter

**Participants**

- 8:00 Renata B. Wolyneć, Great Expectations: A Critical Evaluation of the Cultural Resource Overview of the Allegheny National Forest  
 8:20 Michael Roberts, An Assessment of the Evolution of One Approach to Large Scale Comprehensive Planning from 1978 to 1986  
 8:40 Christy A. Hohman-Caine, The Translation of Law Into Reality: CRM on a National Forest  
 9:00 Break  
 9:20 Patricia L. Parker, Overviews: Do They Fulfill Their Promise?  
 9:40 Fred Plog, Preservation of and for What?  
 10:00 John Knoerl, Managing Historic Preservation Information  
 10:20 Ray A. Williamson, Archaeology, Technology, and Public Policy  
 10:40 Gary D. Shaffer, Sanitized for Your Protection: On the Road with Federal and State Archaeology  
 11:00 Joseph A. Tainter, A Skeptical View of Historic Preservation Planning  
 11:20 Discussants: Michael J. O'Brien, Jacqueline Nichols and George J. Gumerman

**(55) Symposium: POST-PROCESSUAL STUDIES IN PACIFIC ISLAND ARCHAEOLOGY AND ETHNOHISTORY**

## Territories

Organizer and Chairperson: Jo Anne Van Tilburg

**Participants**

- 8:00 J. Peter White, Islands: Mirrors or Mirages of Continents?  
 8:20 Jo Anne Van Tilburg, Easter Island Monolithic Statues and the Symbolic Depiction of Rank Differential  
 8:40 Jeffrey T. Clark, Stranger Chiefs and Younger Brothers: Paradigms for Polynesian Colonization  
 9:00 Robert J. Hommon, New Perspectives on Hawaiian Archaeology  
 9:20 Douglas B. Sutton, The Origins and Operation of the Northern Maori Chiefdomship  
 9:40 John Terrell, Complementary Approaches to Understanding Human Diversity in the Fiji Islands  
 10:00 Patrick V. Kirch, Some Explorations in Lapita Iconography  
 10:20 William S. Ayres, Nan Madol, Pohnpei, and Island Sociopolitical Change  
 10:40 Frank R. Thomas, Explorations Into the Lapita Decline  
 11:00 Thomas J. Riley, Reflections in a Lagoon: Marshallese Atolls as Mirrors of High Islands  
 11:20 Discussant: William F. Keegan

**(56) General Session: LITHIC STUDIES**

## Quebec

Chairperson: Carl J. Phagan

**Participants**

- 8:00 Patricia A. Hicks, The Use of Attributes of Debitage Assemblages as Temporal Indicators  
 8:20 John P. Nass, Household Archaeology and Functional Analysis as Procedures for Studying Fort Ancient Communities in the Ohio Valley  
 8:40 Cathy J. Lebo, Natural Forces and Human Agency — Partitioning Variation in a Lithic Industry  
 9:00 William C. Prentiss, M. Lee Douthit and Eugene J. Romanski, Lithic Procurement and Hunter-Gatherer Organization in the Central Big Horn Basin, Wyoming  
 9:20 Sally McBrearty, The Sangoan and Middle Stone Age of Western Kenya  
 9:30 John Lindly, An Analysis of Lithic Reduction Sequences and Technology at the Upper Paleolithic Site 623, West-Central Jordan  
 9:50 Kim D. Kornbacher, Lithic Technology and Duration of Occupation of a Southern Northwest Coast Shell Midden  
 10:10 Edward E. Smith, Swan's Landing Site: A Stratified Single Component Kirk Manufacturing Site in Harrison County, Indiana  
 10:20 Carl J. Phagan, A Preliminary Projectile Point Typology for the Northern Sinagua  
 10:30 Elizabeth R. Elstien, Heat Treatment on the Northern Hohokam Periphery

- 10:40 Alice W. Portnoy, A Formula for Estimating Minimum Number of Lithic Tools  
 10:50 LuAnn Wandsnider, Chipped Stone Coding Consistency: Testing, Results and Implications  
 11:00 John Tomenchuk, Determining Prehistoric Loading Rates and Their Significance for Functional and Technological Interpretations

**(57) General Session: SOUTHERN CENTRAL AMERICA**

## Alberta

Chairperson: Anthony J. Ranere

**Participants**

- 8:00 Joseph W. Ball, A Preliminary Review of the Ceramic Situation in the Lower Mopan-Macal Triangle, Belize  
 8:20 Jennifer T. Taschek and Joseph W. Ball, Regal-Ritual Residences and Administrative Hubs: Differential Structure and Function Among the Major Centers of the Upper Belize Valley  
 8:40 William M. Ringle, Craig Hanson, Chris von Nagy, Walter Witschey and George Bey, Continuing Investigations of Ek Balam, Yucatan  
 8:50 James E. Brady, Trace Element Analysis of Naj Tunich Obsidian: Protohistoric Trade Implications  
 9:00 Marilyn P. Beaudry and Eugenia J. Robinson, Operationalizing the Ceramic Sphere Concept  
 9:20 Norman Hammond, Investigations at Cuello, Belize, 1987  
 9:30 Anthony J. Ranere and Richard G. Cook, From Hunting-Gathering to Village Agriculture in the Humid Tropics: A 4000 Year Long Process in Central Panama  
 9:50 Patricia Hansell, Craft Specialization, Regional Exchange and Societal Transformation in the Central Panama Formative

**(58) Symposium: INEQUALITY AMONG HUNTER-GATHERERS**

## Library

Organizer and Chairperson: John H. Pryor

**Participants**

- 8:00 John H. Pryor, Gift Baskets and Sale Baskets: Dynamics of Pomo Power Relations  
 8:20 Elena L. Filios, Thresholds to Group Fissioning Among Hunter-Gatherers  
 8:40 Glenn W. Sheehan, Accentuation of Inequality in Eskimo Whaling Societies During Early Contact  
 9:00 Robert L. Bettinger, Progress, Homeostasis, Contradiction, and Inheritance: Models of Hunter-Gatherers in Historical Perspective  
 9:20 Charles A. Bishop and M. Estellie Smith, Northeastern Algonquian Egalitarianism: Aboriginal or Post-Contact?  
 9:40 Gary Coupland, Logistics and Coercion: The Evolution of Non-Egalitarian Social Formations on the Northwest Coast  
 10:00 Discussant: Margaret Conkey

**(59) Symposium: NEW PERSPECTIVES ON NORTHERN BOREAL FOREST LIFE**

## Confederation 3

Organizer and Chairperson: Wendy H. Arundale

**Participants**

- 8:00 Christopher C. Hanks and David Pokotylo, The MacKenzie Valley: A Reconsideration of the Dene  
 8:20 Robert R. Janes, Some Methodological Considerations in Northern Athapaskan Archaeology  
 8:40 Chris Rabich Campbell, The Nexadi Phratry of the Sanyakwan Tlingit  
 9:00 Wendy H. Arundale and Eliza Jones, Historic Settlement and Subsistence Patterns in the Koyukuk River Area: New Perspectives from Recent Research  
 9:20 David R. Yesner, Moose Hunters of the Boreal Forest? A Reexamination of Boreal Forest Subsistence Patterns

- 9:40 John P. Cook, Ethnology, History, and Archaeology at Healy Lake Village  
 10:00 Discussants: Polly McW. Quick and Donald W. Clark

**(60) Symposium: STRUCTURAL AND SYMBOLIC STUDIES IN TEXT-AIDED ARCHAEOLOGY**

Alberta  
 Organizer and Chairperson: Matthew H. Johnson

**Participants**

- 10:20 Matthew H. Johnson, Theory in Text-Aided Archaeology: A Structural Approach  
 10:40 Robert Blair St. George, Human Houses in Early New England: Connections Between Architecture and Literature  
 11:00 Dienne M.E. Kenyon, Deconstructed Thule Structures  
 11:20 Christopher Hays, Storing Food and Storing Corpses in Prehistoric Tennessee  
 11:40 Randall M. Withrow, Aspects of Meaning in Eastern Dakota Mortuary Practices: An Investigation Using Ethnohistoric and Archaeological Data  
 12:00 Discussant: Mark P. Leone

## ABSTRACTS OF SYMPOSIA

**(2) PLUNDERERS, PROFITEERS AND PUBLIC ARCHAEOLOGY: PRACTICAL APPROACHES TO PREVENTING THE LOOTING OF ARCHAEOLOGICAL SITES AND THE TRAFFIC OF ANTIQUITIES.**

How did Indiana Jones get away with it? This symposium presents a provocative examination of the cultural values in the United States and Canada which affect those who would plunder and profit by the looting of archaeological sites. Practical approaches used by state or provincial archaeology offices and local organizations to deal with this problem are explored and their relative success evaluated. The symposium will focus on programs which deal effectively with looting and the sale of artifacts taken from sites located on private, state, provincial or municipal lands. The programs feature the strong enforcement of antiquities laws, prosecution of violators, public education, and outreach.

**(4) THE EARLY UPPER PALEOLITHIC: EVIDENCE FROM EUROPE, THE NEAR EAST, AND NORTH AFRICA.**

The purpose of this symposium is to focus attention on the early Upper Paleolithic as a distinct entity in the archaeological record, yielding important contrasts with both the Middle and later Upper Paleolithic. The papers range from topical concerns (e.g., fauna or art) to areal syntheses for various parts of Europe and the Mediterranean Basin. Temporal boundaries vary geographically, but throughout these regions transitions in the archaeological record may be identified at 40,000-35,000 B.P. (or somewhat earlier) and 25,000-20,000 B.P. The possible implications for human social, economic, and cultural behavior during the intervening period are explored.

**(5) RECENT ARCHAEOLOGICAL AND ETHNOHISTORIC RESEARCH IN THE STATE OF OAXACA: A STUDY OF AN ANCIENT CORE AND ITS PERIPHERIES.**

This symposium reviews on-going archaeological, art historical, and ethnohistoric research from several environmentally diverse regions in the state of Oaxaca, Mexico. Important historical and organizational differences in prehispanic patterns of change and development are noted between the Valley of Oaxaca core and other areas in the state. Various perspectives (including environmental considerations, macro-regional approaches, and historical analyses) are employed to interpret these distinctive evolutionary trajectories. A broader understanding of ancient Oaxaca and its prehispanic diversity should result.

**(6) GEOARCHAEOLOGY OF THE ANDEAN COAST: RECENT ADVANCES.**

Over the past decade, there has been an increasing awareness among archaeologists working on the Andean Coast of the interrelationships between alterations in the climate and the physical environment on the one hand and prehistoric society and culture on the other. This awareness has been accompanied by a number of important, sometimes controversial, new studies integrating geological and archaeological data. Contributors to this symposium address processes such as coastal uplift, sea level change, beach ridge formation, and the El Niño phenomenon from the perspective of both geological studies and archaeology, in order to understand better the relation of people to environment in the Andean past.

**(7) THE ARCHAEOLOGY OF SOUTH ALASKA: SUBSTANTIVE AND THEORETICAL CONTRIBUTIONS.**

This symposium will be concerned primarily with the presentation of substantive data from a number of current research projects conducted in the southern Bering Sea, Aleutian, and Kodiak regions of south Alaska. Contributions will examine the time span from the earliest known inhabitants to the Russian-American era. Ethnohistorically this region was once solely occupied by distantly related Yupic-speaking Eskimos and Aleuts, who, in combination, far outnumbered related cultures ranging from northwestern Alaska to Greenland. Traditional and recent theoretical concerns will address such issues as the evolution of complex hunting societies or "affluent foragers"; model building; the reconstruction of ecology, demography, and settlement patterns; the evaluation of the roles of migration, diffusion, and in situ development; and the relationship of human biology, language, and culture over time and space.

**(8) INTERREGIONAL INTERACTION IN PREHISTORY.**

The purpose of this symposium is to provide an overview of approaches to the question of what role interregional interaction plays in prehistoric processes of social change. This broad subject has excited considerable interest among archaeologists of late as seen, for example, in the development

of trade, world system, and peer polity interaction models. Participants in the symposium will use their diverse research experiences and theoretical perspectives as a base for considering the strengths and weaknesses of different approaches and the variety of interaction processes attested from different parts of the world.

(9) **DIXIE CUPS AND CROWN JEWELS: ANALYTICAL APPROACHES TO THE ORGANIZATIONAL PROPERTIES OF STONE TOOL TECHNOLOGIES.**

The concepts of curation and expediency have been defined as extremes in a continuum of planned organization of technologies (Binford 1979). While these ideas are widely referenced, most researchers continue to rely on post hoc definitions and expedient analytical criteria in studying them. In this symposium, researchers studying lithic data from a variety of contexts will critically explore common themes: 1) the utility of concepts such as curation and expediency will critically explore common record, 2) methods for investigating the organizational properties of prehistoric technological systems, and 3) the relationship between subsistence system, raw material availability, and planning in the production and use of tools.

(11) **THE FOREIGN RELATIONSHIPS OF TEOTIHUACAN.**

Although its influence was widespread in Middle Horizon Mesoamerica, Teotihuacan should not be viewed as a monolithic force in its interactions with other societies. Its effects took a number of forms, and may have been mediated through a variety of agents: state emissaries, traders, military adventurers, refugees, etc. Symposium participants will explore the evidence for Teotihuacan influence in their areas, and will assess the impact of Teotihuacan on local cultures and on their developmental trajectories. The reflexive effect of these interactions on Teotihuacan itself will also be discussed.

(14) **DESERT AND OASIS: HOLOCENE ARCHAEOLOGY OF THE WESTERN DESERT OF EGYPT.**

Archaeological and palaeoenvironmental investigations in the Western Desert of Egypt highlight the role of desert regions in agricultural origins and human responses to the changing post-glacial climate. The symposium aims to present some of the more recent and dramatic discoveries from the beginning of cattle management during the early Holocene to the Saharan origins of Nilotic food production, interregional diversity and connections, chronology, palaeoclimate and cultural change.

(18) **GOVERNMENT PROCESSES AND THE COAL INDUSTRY: CAN ARCHAEOLOGISTS ADAPT?**

Surface coal mining operations affect hundreds of archaeological sites every year. Most coal mining operations in the United States, especially in the East, are permitted by State mining authorities, not the Federal government, although the Office of Surface Mining reviews and approves those State programs. Federal laws protecting historic resources from Federal actions do not apply directly. If archaeologists are to have a positive effect on the treatment of resources affected by coal mining, they must learn to use the review processes that do apply to the permitting of coal mining. The papers in this symposium discuss these processes from the Federal, State and private points of view, and present two cases of archaeological work done under State mining programs.

(20) **HUNTER-GATHERERS AT THE LAST GLACIAL MAXIMUM: THE GLOBAL RECORD.**

Contemporary questions about past human adaptations and cultural practices call for the control of data on large spatial scales. This symposium will offer comparative data on paleoenvironments and the distribution and adaptation of hunter-gatherers in the world at a particular climatic moment - the last glacial maximum around 18,000 B.P. Papers will present a synthesis of available data on the different regions of the Old World and note and consider the significance of discontinuities in the record. The discussants will comment on 1) the problems faced in attempting a global survey including questions about how data are collected and the comparability of different data sets 2) the status of groups in the New World, and 3) offer suggestions on the directions for future research to take.

(21) **ECONOMY & SOCIETY IN THE MEDIEVAL NORTH ATLANTIC.**

The session centers upon the archaeology of the Scandinavian North Atlantic, with an emphasis on environmental/economic approaches adopted recently by North American and Scandinavian workers. The session includes papers on the brief Vinland settlement, the now extinct Norse colony of Greenland, Iceland, and the commercially successful Shetlandic community. Several papers will discuss the complex interplay of Little Ice Age climatic change with regional politics and changing trade networks, combining social and environmental explanations. All papers present new data from a region and period attracting increasing attention from anthropological archaeologists.

[23] **RADIOCARBON UPDATE: PROGRESS AND PROBLEMS IN RADIOCARBON DATING.**

Recent advances in radiocarbon dating techniques such as accelerator mass spectrometry and high-precision calibration have virtually revolutionized the field. Undersized samples such as seeds or cuttings, blood residues, and bone fragments, formerly unsuitable for dating, can now be dated with precision and speed. Dendrochronological calendars have been extended back in time to about 13,000 years B.P. and across continents, from the west coast of the United States to continental Europe. New calibration curves are now available for the highest precision in dating. Progress in radiocarbon dating techniques have also led to new problems, for daters and users, in managing and utilizing the mounting archaeological data.

[24] **THE EFFECT OF VISIBILITY ON THE INTERPRETATION OF SETTLEMENT PATTERNS.**

One of the first questions students always ask archaeologists is "How do you know where to dig?" Invariably, the answer involves something about pertinent previous research. But how pertinent is previous research? New detection techniques and ethnoarchaeological guidelines from many parts of the world suggest that preconceived ideas about where to dig may cause serious biases in data collection. This symposium presents a set of case studies offering new insights on the interpretation of archaeological settlement data. Ethnoarchaeological studies from Nigeria, Greece and Honduras offer a broadened perspective on interpretation, while innovative techniques reported from China, Africa, Jordan, Central America, and the southwestern U.S. suggest some new answers to the old question of how archaeologists decide where to dig.

[26] **AGRICULTURAL LAND-USE VARIABILITY IN THE PREHISTORIC SOUTHWEST.**

Fast studies of prehistoric agriculture have tended to examine the evolution of agricultural strategies by emphasizing a single type of land-use, such as water management systems. This symposium will stress the interaction of labor availability, resource concentration, and economic considerations that may have been responsible for the diversity of land-use strategies in the northern and middle Rio Grande Valley in New Mexico. In order to highlight this diversity papers focus on the role of limited activity sites within these agricultural land-use strategies.

[27] **SITE STRUCTURE AND SPATIAL ORGANIZATION OF SEDENTARY COMMUNITIES**

Site structure and the organization of space are important analytical concepts that have been employed primarily in hunter-gatherer studies. Analyses of activity arrangements, however, can also produce significant insight into the material record of non-mobile societies. This symposium explores the factors that condition the location and execution of activities in sedentary communities. Papers focus on the unique scheduling requirements and spatial constraints affecting task performance. An emphasis is placed on linking activity structure and spatial arrangement in sedentary settings to their material consequences in the archaeological record.

[28] **CURRENT ISSUES IN THE ARCHAEOLOGY OF THE NORTHERN ANDES.**

This symposium will showcase new investigations in the Northern Andes (Southern Colombia, Ecuador and Northern Peru) by both established and younger scholars. The work reported contributes to our understanding of basic regional chronology and culture history in this poorly-known but essentially important region, and illuminates prehistoric subsistence strategies including water management, and patterns of exchange and inter-regional contacts in an environmentally complex geographical area lying between Mesoamerica and the Peruvian culture area.

[29] **THE MEANINGS OF CONSUMPTION: ONGOING RESEARCH IN HISTORICAL ARCHAEOLOGY.**

Historical archaeologists have traditionally studied production and consumption as separate phenomena. The contributors to this symposium are attempting to study these entities as they effect each other and are exploring the relationship of these with ideology and the meaning of material culture. The contributors will explore these issues using historical documentation, archaeological data and theoretical background from anthropology and social history. Case studies are drawn from various regions in the United States ranging through the eighteenth and nineteenth centuries and from medieval Scotland.

[30] **LITHIC SOURCING AND PROCUREMENT STRATEGIES.**

Prehistoric cultures utilized a wide variety of local and non-local lithic materials. The interpretation of the nature, mechanics and distribution of this use has often been based on a widespread and erroneous archaeological folklore — a folklore based in part on misunderstandings of the materials and their sources. Any interaction/procurement models based, in part, on lithic source identification or differentiation must be substantiated by accurate and replicative data on lithic variability and

characterization. This symposium addresses these problems for the eastern two-thirds of the United States and offers examples of solutions to this dilemma.

### (33) PROBLEMS IN ONTARIO PREHISTORY

This session illustrates a range of theoretical and methodological approaches current in Ontario prehistoric archaeology. There is an emphasis on the time depth and cultural diversity present in this geographically diverse region which stretches from New York to Minnesota and from the Great Lakes to Hudson Bay. There will be consideration of problems of research and of cultural resource management in regions of difficult access, and a consideration of the effects of accessibility on the perception of prehistoric resources.

### (35) APPROACHES TO DATING NORTH AMERICAN ROCK ART.

The chronological position of rock art in various North American culture areas remains an unresolved problem. Within the past decade, a number of divergent approaches to dating rock art have begun to appear. This symposium will present research results from a range of archaeological studies, including the chemical analysis of pigments and patination, the composition and physical deterioration of rock art, dating rock art by associated archaeological materials, the distribution of historic period artistic motifs, and the use of oral history, ethnography and ethno-archaeological sources for dating. The speakers conduct their work in California, British Columbia, the Great lakes area, Wisconsin and Ontario.

### (38) BEYOND COUNTS, CATALOGS AND CHRONOLOGIES: NEW DIRECTIONS IN ROCK ART RESEARCH.

Traditional analyses of prehistoric rock art have provided little archaeological or anthropological inference and interpretation. New work from three continents, presented here, takes three complementary directions to go beyond this traditional impasse. Ethnohistorical/ethnographic approaches provide a fuller picture of what the art represents and its role in society. Formal methods of studying the geometry and internal systematics of engravings, not dependant on an ethnographic context, give information of a different character. Ethnography of communication-based studies analyze the art as an archaeological artifact of prehistoric ritual, attempting to place the nature of the ritual, and thereby the meaning of the art, in a socio-religious context.

### (40) EXCHANGE SYSTEMS IN NORTH AMERICA: CONNECTIONS AND INTERFACES.

Native North American peoples were constantly moving commodities across regional boundaries. Such interactions had social, economic, and epidemiological impacts on the various exchange groups. The emphasis of this symposium is on the types of commodities traded, the intensity of interaction, and the structure of these exchange systems. To better understand these systems' dynamics prior to and after the time of contact, the participants of this symposium will examine exchange systems both temporally (from Paleoindian through protohistoric periods) and spatially from Canada to Costa Rica. Such coverage represents our current knowledge concerning the connections and interfaces between aboriginal peoples throughout North America.

### (41) PROVINCIAL INKA: PROBLEMS AND MEANS OF IDENTIFICATION.

Within the short span of 100 years, the Inka conquered and incorporated large numbers of ethnically diverse groups into a single empire, Tawantinsuyo. The historical development of Tawantinsuyo has been reconstructed from various Inka and Spanish sources, but documenting this development archaeologically has been problematical. In particular, identifying Inka-induced changes in provincial areas is difficult, because the distinctions between Inka and pre-Inka material culture are not well-defined. The papers in this symposium provide data concerning the Inka presence in provincial areas and their ramifications for interpreting the cultural interactions between the conquerors and the conquered.

### (42) THE GARDENS OF PREHISTORY: A LOOK AT CULTIVATION NEAR THE RESIDENCE FROM THE PERSPECTIVE OF THE ARCHAEOLOGIST.

The symposium examines recent research by archaeologists and geographers concerning near residential gardening (including kitchen and door yard gardens) and prehistoric agriculture. The papers concentrate on: the definition of different systems of infield cultivation based on their form and content, the identification of garden areas in prehistoric contexts using chemical and conventional archaeological methods, and ethnoarchaeological research targeted at understanding the gardens as an important component of ancient settlement and site structure. The papers range areally from the American Southwest, through Mexico and Central America, to northern South America. The discussants offer critiques from the perspectives of archaeology and geography.

### (44) THE INTERPRETATION OF SPATIAL PATTERNS WITHIN STONE AGE ARCHAEOLOGICAL SITES.

Intra-site spatial analysis has been dominated by a variety of quantitative methods for the recognition of spatial patterning. Of equal importance is the development of a body of theory for interpreting spatial patterns. This symposium will examine a selection of both stone age archaeological and modern hunter-gatherer sites, focusing on behavioral, depositional, and other aspects of site formation. The program will be organized to trace through the paleolithic record, the size of sites, the number, density, size, shape, and composition of scatters of material remains, and possible interpretations of the events that formed the spatial patterns. Ethnographic data will be used to examine the relationship between spatial patterns and the processes that formed them.

### (46) EASTERN PALEO-INDIAN LITHIC RESOURCE UTILIZATION.

The theme of this session is eastern Paleo-Indian treatment of lithic resources as a key for inferring other aspects of their cultural systems and to understanding their adaptations. Besides making substantive contributions to our knowledge of Paleo-Indians from Florida to Ontario (such as the sourcing of lithics and its implications for settlement mobility and exchange), the papers examine important theoretical questions of interest to a wider range of archaeologists. These include: the causes of lithic procurement patterns; the effects of technological organizational factors like mobility and lithic source access on inter-assemblage variability; and the explanation of change in lithic industries.

### (47) COASTAL MAYA TRADE AND EXCHANGE.

This symposium presents the results of recent research on both the coasts of Belize and Mexico that provide new insights into the nature and development of coastal Maya trade and its integration in ancient Maya society. The thematic focus allows a unique opportunity to address: (1) the development and importance of coastal trade; (2) the extent of long-distance versus more localized coastal trade; (3) the relation between coastal and inland trade; and (4) various trade models for the coastal Maya. Obsidian source identifications, qualitative and quantitative studies of local exotic materials and finished goods, architectural, locational, geological, and distributional data are marshalled.

### (48) DEMOGRAPHY, PRODUCTION, AND EXCHANGE IN THE EVOLUTION OF COMPLEX SOCIAL ORGANIZATION IN LATE PREHISTORIC EUROPE.

The cultures of Europe since the end of the Bronze Age, that is in the last millennium B.C. and the first millennium A.D., were marked by the evolution of increasingly complex social systems. At various times and places such manifestations as towns and social stratification appeared and disappeared, but the overall trend was toward the establishment of these forms on a widespread basis and the emergence of the pattern that was to characterize historical Europe. This symposium will evaluate the importance of varying factors which may have promoted or limited this development. The theoretical difficulties of approaching this problem will be analyzed, and then the different forms which complex societies can assume will be examined in relationship to causal factors.

### (50) TIWANAKU AND ITS HINTERLAND: RECENT RESEARCH IN THE TITICACA BASIN OF BOLIVIA.

This symposium presents the results of the first season of the Proyecto Wila Jawira, a binational, multidisciplinary research program currently investigating the organizational and environmental factors that governed agrarian reclamation, expansion, and collapse in the state of Tiwanaku. Organized under the auspices of the Instituto Nacional de Arqueología de Bolivia and the University of Illinois at Chicago, the project represents a major, five year research initiative in the Titicaca basin of Bolivia. Symposium participants will discuss archaeological, paleolimnological, and paleohydrological work undertaken in a 70 km<sup>2</sup> zone in Bolivia that constituted the principal rural sustaining area for the city of Tiwanaku.

### (53) SAS INTERFACES '87: MICROSCOPY FOR THE ARCHAEOLOGIST.

Interfaces is a workshop program, organized by the Society for Archaeological Sciences for the purpose of introducing archaeologists to the range of analytical techniques that will enhance data recovery and interpretation. This year seven recognized specialists in microscopy will demonstrate structural differences among prepared samples of pollen, phytoliths, shell annulae, metals, ceramics, use-wear, and hydration rims viewed by the audience via video camera and console. Potentials and limitations of each technique will be discussed.

### (54) CULTURAL RESOURCE MANAGEMENT AT THE CROSSROADS: ASSESSING THE PAST AND PLANNING THE FUTURE.

Cultural resource management today faces two contrasting trends: increased recognition and congressional interest on the one hand, and considerations of cost and questions about past accom-

plishments on the other. Archaeologists must respond by critically evaluating past accomplishments and planning the future accordingly. Topics discussed in this symposium are pertinent to refining cultural resource management. They include evaluating past efforts at overviews, data bases, modeling and planning; pursuing research on nationally important topics; and addressing the limitations of planning-based approaches.

#### (55) POST-PROCESSUAL STUDIES IN PACIFIC ISLAND ARCHAEOLOGY AND ETHNOHISTORY.

Recent research on several different islands and archipelagoes in the Pacific is presented in this symposium. Extending naturally from the idea of islands as "laboratories" for the study of cultural processes, the central organizing theme pursued is the exploration of alternative strategies for modeling the documented diversity of social, political and ideological conventions framing these island societies. General symbolic and structural principles are assembled and examined within the contextual framework of restraints and consequences of the natural and social environment. Reference to the historical inheritance of particular cultural traits is seen as a fundamental element of "contextual" archaeology.

#### (56) INEQUALITY AMONG HUNTER-GATHERERS.

The symposium and following discussion among archaeologists and ethnographers will focus on the usefulness of the concept of inequality and power relations in the study of hunters and gatherers. The myth of the egalitarian hunter-gatherer has permeated work on these groups to the exclusion of the study of their power relations and inequality. While there is some danger that such studies will lead to the view that inequality is universal, the monolithic view of egalitarian hunter-gatherers misses the diversity and the dynamics present in the power relations of hunter-gatherers, whether prehistoric or more recent.

#### (59) NEW PERSPECTIVES ON NORTHERN BOREAL FOREST LIFE.

Recent years have seen steady progress in research on the archaeology of boreal forest areas. New approaches, such as ethnoarchaeology and related studies in linguistics and oral history, new data from the ethnohistoric record, and funding from land claims investigations and cultural resource management requirements have all contributed to this effort. In this session, researchers will present and discuss some of the current methods and resulting new perspectives for studying late prehistoric, contact, and historic period dwellers of the northern boreal forest in western Canada and Alaska.

#### (60) STRUCTURAL AND SYMBOLIC STUDIES IN TEXT-AIDED ARCHAEOLOGY.

The recent growth of interest in symbolic and structural archaeology has had mixed results. Prehistoric studies have found the identification of meaning in the archaeological record to be problematic and have been open to charges of abstraction and unverifiability.

This session therefore attempts to explore the potential of such approaches in a range of areas where archaeological information may be combined with texts of various forms. A structural approach is seen as useful in integrating these data, while conversely such studies demonstrate the true potential of such forms of analysis.

## ABSTRACTS OF PAPERS

*Ackerman, Robert E. (Washington State)*

#### THE EARLY CULTURAL HORIZONS OF INTERIOR SOUTHWESTERN ALASKA.

The earliest cultural horizon (c. 11,000-8,000 BP) is represented by sites containing artifact assemblages of the *Paleo-Arctic/Beringian Tradition* and an as yet poorly defined projectile point tradition. These sites are found on the foothills of the Kilbuck and Kuskokwim Mountains beyond the extent of Pleistocene glaciation and probably represent a periglacial occupation during the early warming phases of the Late Wisconsin. This cultural horizon was followed by a shift in the hunting patterns from the foothill zone to the previously glaciated mountain uplands. Assemblages of this period are grouped under the *Late Tundra Tradition* (c. 8,000-6,000 BP). These two cultural horizons will be explored in terms of site and assemblage relationships against a background of changing paleoenvironmental conditions.(7)

*Adovasio, J.M., R.L. Andrews and Ronald C. Carlisle (Pittsburgh)*

#### NEW EVIDENCE FOR THE DIFFUSION OF THE NUMIC SPEAKERS IN THE GREAT BASIN.

Analysis of the extensive perishables assemblage from Dirty Shame Rockshelter in that part of the northern Great Basin in southeast Oregon has revealed several major shifts in artifact occurrence and frequency that are most parsimoniously explained by a population replacement model. Changes in two major cordage types, the disappearance of all three major sandal types, and, perhaps most important, the appearance of coiled basketry at the site appear to signal the arrival of Numic-speaking populations, probably the Northern Paiute. This interpretation of the perishables is supported by the lithics and other data from this site as well as by data from other Great Basin sites, notably the Monitor Valley caves in Nevada and information from the August, 1986 excavations at Danger Cave, Utah. Collectively, these data appear to offer convincing artifactual evidence for the advent of the Numic speakers in the Great Basin and the chronology of that event.(51)

*Aigner, Jean S., Lydia T. Black, Dominique Desson (Alaska, Fairbanks), Allen P. McCartney*

*(Arkansas, Fayetteville), and Douglas W. Veltre (Anchorage Community)*

#### HISTORIC DOCUMENTS AND AN 18TH CENTURY ALEUT VILLAGE ON UNALASKA.

Unpublished and untranslated documents (ship logs and administrative reports) are valuable aids in reconstructing early Russian period settlement patterns in the Aleutian Islands. Archaeologists can use such source information, specifically in documents of 1759-62 and 1764-66, to describe an 18th century settlement at Reese Bay. Excavations of communal longhouses at this site archaeologically establish the kinds and quantities of trade goods used. Reese Bay is being examined on the basis of internal social ranking of households within the longhouses, reported Russian-Aleut conflict at this site, and possible multiple social policies operating on Unalaska at the time of contact.(7)

*Aigner, J.S. (see McCartney, A.P.)(7)*

*Aletto, Thomas F. (Illinois, Urbana-Champaign)*

#### ECUADORIAN CHRONOLOGY FROM THE GULF OF GUAYAQUIL.

Recent excavations on La Puna Island reveal that the current culture chronology of Ecuador is grossly inaccurate. Pottery of the Bellavista site represents an early period of the Guayaquil phase defined at the San Pedro de Guayaquil site. The Guayaquil phase is revealed as a regional variant of the Late Formative Chorreroid tradition. Because white-on-red and negative painting are the dominant decorative techniques of the complex, they can no longer serve as diagnostic markers for the Regional Development Period. The Jambeli phase is shown to post-date Guayaquil and does not begin before 200 B.C. These data, in conjunction with the revised Valdivia, Machalilla and Guangala sequences, provide the basis for building an accurate period chronology to replace the old stage system.(28)

*Algeze, Guillermo (Chicago)*

#### MESOPOTAMIAN EXPANSION AND ITS CONSEQUENCES: SOCIAL CHANGE IN THE NORTHERN PERIPHERY OF ALLUVIAL MESOPOTAMIA IN THE LATE FOURTH MILLENNIUM B.C.

One of the most startling discoveries of recent research in the Syro-Mesopotamian plains has been a clearer realization of the magnitude, intensity, and variety of contacts between the civilization of alluvial Mesopotamia in the Uruk period and communities in its northern periphery. A small number of Uruk sites were established in the Syro-Mesopotamian plains at locations of considerable strategic importance commanding the overland and water-borne routes of communication. This settlement pattern suggests a strategic rationale designed to ensure control of long distance trade. The intrusive



Uyak sites had a significant impact on the social and economic structures of indigenous polities. That impact can be detected archaeologically at a number of contemporary Late Chalcolithic sites.(3)

*Allen, Harry R. (Auckland)*

**ARCHAEOLOGY OF THE MURRAY-DARLING RIVER BASIN, AUSTRALIA, c. 18,000 B.P.**

The rivers and lakes of the Murray-Darling system provide a sensitive link between highland catchments to the east and the more arid playa and aeolian environments of the interior. Cold, dry conditions during the late Pleistocene (30,000-18,000 BP) associated with high river discharges and high lake levels produced favourable conditions for hunter-gatherers in localities on the margins of the arid interior, such as the Willandra Lakes. By 15,000 BP, river discharges and lake levels were substantially reduced accompanied by changes in the location but not necessarily the intensity of settlement. Intensive occupation of the semi-arid plains of western New South Wales did not take place until the mid Holocene (c. 5,000 B.P.)(20)

*Amorosi, Thomas (Graduate Center, CUNY)*

**THE KARLUK RIVER AND UYAK BAY ARCHAEOFAUNAS.**

This paper summarizes preliminary research for a number of archaeofaunas recovered from the Karluk River and Uyak Bay areas of Kodiak Island, Alaska. The analysis of the faunal remains indicates a pattern of localized specialization of resources within a context of long term climatic stability for the Pacific Eskimo within the confines of Kodiak Island. Findings emphasize sharp contrasts between Kachemak and Koniag economies, and other Inuit populations of the Bering Sea and High Arctic regions.(7)

*Anders, Martha B.*

**WAMANGA POTTERY: STYLISTIC INNOVATION AND IMITATION IN THE MIDDLE HORIZON 2 CERAMICS FROM THE PLANNED WARI SITE OF AZANGARO (AYACUCHO, PERU).**

Wamanga style pottery is assessed in terms of possible indicators of ethnic differentiation and of state-local and regional interaction. The varying degrees and contexts of stylistic imitation and innovation, the patterns of inclusion and exclusion, reflect contradictory yet complementary processes of homogenization and diversification. The apparent manipulation of symbolic information in both form and decoration of Wamanga pottery suggests sentiments of restiveness and dissension within the core of the Wari state and challenges to centralized Wari authority.(13)

*Andresen, John M. (National Park Service, Coolidge)*

**CLASSIC PERIOD HOHOKAM GROUP STRUCTURE.**

Hohokam settlements vary greatly in area covered by structures and in the size distribution of structures within a community. Analysis of Hohokam compound sizes reveals Classic Period Group, or community, structure. Size distribution analysis further allows useful comparison of incomplete or poorly preserved compound groups in the Hohokam core area of southern Arizona. A tri-modal rank-size distribution of compounds suggests a three-level socio-political hierarchy. This hierarchy can also be inferred from non-settlement pattern data, which supports inferences made from settlement pattern data.(51)

*Andrews, Anthony (New College of USE Sarasota)*

**A TYPOLOGY OF MAYA TRADING PORTS.**

Archaeologists have identified four major types of specialized trading ports on the coasts of the Maya lowlands. These include: (1) ports of embarkation for off-shore islands, (2) "ports of trade", (3) coastal trans-shipment ports, and (4) sea ports of inland polities. The evidence for the identification of these major types is evaluated, and the additional roles of Maya ports as coastal ceremonial centers and necropoleis are also considered.(47)

*Andrews, R.L. (see Adovasio, J.M.)(51)*

*Anschuetz, Kurt E. and Timothy D. Maxwell (Museum of New Mexico, Laboratory of Anthropology, Santa Fe)*

**AGRICULTURAL INTENSIFICATION AND DIVERSIFICATION IN THE NORTHERN RIO GRANDE.**

Study of Anasazi rock-bordered and cobble-mulched agricultural complexes on terraces overlooking permanent streams in the northern Rio Grande reveals labor-intensive farming technologies. Rock fields were used between A.D. 1350 and 1450 in the upper limit of the region. These plots represent: 1) a short-term response to population pressure; 2) a buffering strategy against unpredictable frosts in the valley bottoms; and 3) an approach to avoid reduced crop yields due to catastrophic or prolonged

floodplain runoff. The development and ultimate failure of these technologies are discussed in terms of population growth, social interaction, and climatic flux.(26)

*Anschuetz, K.E. (see Maxwell, T.D.)(42)*

*Anyon, R. (see Leonard, R.D.)(34)*

*Arnold, Bettina (Harvard)*

**SLAVERY IN LATE PREHISTORIC EUROPE: RECOVERING THE EVIDENCE FOR SOCIAL STRUCTURE IN IRON AGE SOCIETY.**

Most of our information regarding social structure in the early Iron Age is based on cemetery evidence which represents only a fraction of the total population and scant regional settlement data. There are three important issues to be investigated: (1) Can some continuity be assumed from the early to the late Iron Age, and if so how can it be archaeologically corroborated? (2) How can new questions be asked of the existing archaeological data to clarify this aspect of early Iron Age society? (3) What research directives do the findings generated by these questions suggest?(48)

*Arnold, D. (Wheaton)*

**CULTURAL PROCESS AND CHANGES IN CERAMIC TECHNOLOGY IN TICUL, YUCATAN, MEXICO.**

It is widely believed by archaeologists that changes in ceramic technology are reflective of broader cultural changes in the society. How are changes in ceramic technology related to cultural processes? Using a model of feedback processes described elsewhere (in *Ceramic Theory and Cultural Process*, Arnold, 1985), this paper will explore the relationship of various cultural processes and the changes in ceramic technology that occurred in Ticul, Yucatan, Mexico, between 1965 and 1984.(32)

*Arnold, Philip J. (New Mexico)*

**A SITE STRUCTURAL APPROACH TO MODELING CERAMIC PRODUCTION.**

The spatial and temporal distribution of activities within a household provides important clues into the behavioral constraints affecting domestic task performance. Ceramic production, a common activity among sedentary communities, is also subject to these limitations. Ethnoarchaeological research among Mexican potters is used to develop a model of production behavior as reflected in the utilization of space and activity scheduling. Emphasis is placed on the material consequences of activity organization, and the transition in the archaeological record as production becomes more intensive.(27)

*Arundale, Wendy H. and Eliza Jones (Alaska, Fairbanks)*

**HISTORIC SETTLEMENT AND SUBSISTENCE PATTERNS IN THE KOYUKUK RIVER AREA: NEW PERSPECTIVES FROM RECENT RESEARCH.**

New data from subsistence studies, oral history, linguistic research especially on placenames, and site surveys related to land claims have become available on the Koyukuk River regions of interior Alaska. Previous work by A. McFadyen Clark and others provides a useful framework for understanding historic subsistence and settlement patterns in the area. This paper shows how these newer data drawn from diverse sources may be brought together to clarify and enhance earlier findings concerning these patterns and how they have changed over time.(59)

*Ashmore, W. (24)*

*Athens, J. Stephen*

**ETHNICITY AND ADAPTATION: PREHISTORY IN NORTHERN HIGHLAND ECUADOR.**

Autochthonous development is the single most pervasive characteristic of prehistoric societies of northern highland Ecuador. This is in stark contrast to the customary view of social development for this area, which emphasizes inter-regional ties and diffusion. Recent research in northern highland Ecuador is reviewed from the period of the earliest known agriculturalists until the advent of the Incas. The insular character of the prehistoric societies of this area is argued to be a predictable result of adaptation to inter-group and intra-group competition, which is expressed in terms of well-defined social boundaries and ethnic markers.(28)

*Audouze, Françoise and Beatrice Schmider (CNRS, Paris, France)*

**NORTHERN AND CENTRAL FRANCE AT 18,000 B.P.**

Archaeological records from Northern and Central France are disparate for the last glacial maximum. The absence of cultural remains from northern France suggests that this region was abandoned during the coldest period. Evidence from Central France, on the other hand, most notably from the Loire valley, indicates that different microenvironments were occupied by hunter-gatherer groups using Solutrean and Badegoulian industries.(20)

*Ayres, William S. (Oregon)*

**NAN MADOL, POHNPEI, AND ISLAND SOCIOPOLITICAL CHANGE.**

Archaeological and ethnohistoric evidence is reviewed to assess Pohnpei as an island laboratory useful for examining prehistoric cultural processes spanning a 2000 year period of changing sociopolitical complexity. Critical to this assessment is the formulation of a model that specifically relates archaeological remains to hierarchical systems of administrative centers and burial complexes. Interrelationships between archaeological data and the ethnographic models commonly employed in Pacific island studies are discussed.(55)

*Bailey, G.N. (Cambridge) and C. Gamble (Southampton)*

**GREECE AND THE BALKANS AT 18,000 B.P.**

This region exhibits 1) sharp ecological gradients over short distances from high mountains to sea-coasts; 2) an ecological transition between periglacial steppe-tundra to the north and Mediterranean environments to the south, and is 3) a principal geographic corridor for north-south population dispersal and contact; 4) a region of recent field investigations with new opportunities for methodological and conceptual innovations in an area of relatively little previous archaeological investigation or destruction. The problem of human settlement during maximum glacial conditions and its archaeological investigation will be reviewed in the light of these points.(20)

*Ball, Joseph W. (San Diego State)*

**A PRELIMINARY REVIEW OF THE CERAMIC SITUATION IN THE LOWER MOPAN-MACAL TRIANGLE, BELIZE.**

Adjoining the prehistoric archaeological community of Baking Pot on its upriver southwest is that of Buenavista del Cayo. Encompassing some 175 km<sup>2</sup> of the pentagonal valley bottom defined by the lower Mopan and Macal Rivers, this realm includes the regal-ritual palace-centers of Xunantunich and Cahal Pech as well as many smaller sites and the major urban administrative center, Buenavista. Based on recent excavations and earlier work, this paper outlines a preliminary ceramic sequence for the Buenavista community and discusses its relationships to those of neighboring polities in Belize and Guatemala. The sequence stretches from the seventh century B.C. into the tenth or eleventh century A.D.(57)

*Ball, J.W. (see Kelsay, R.G.)(43)*

*Ball, J.W. (see Taschek, J.T.)(57)*

*Bamforth, Douglas B. (California, Santa Barbara)*

**SETTLEMENT, RAW MATERIAL, AND LITHIC PROCUREMENT IN THE CENTRAL MOJAVE DESERT.**

This paper explores human exploitation of two quarries in the central Mojave Desert. Technological analysis and cation-ratio dating of refitted core/flake sequences indicate that despite major changes in technology and human mobility, raw material selection, and reduction strategies, the range of objects removed from these sites remained constant throughout prehistory. Changes occurred in the rates at which the sites were exploited and in the kinds of objects emphasized in production during different periods. These results indicate that human use of these sites was conditioned by several factors in addition to settlement pattern, including raw material quality and abundance and quarry location.(9)

*Bamforth, D.B. (see Berry, S.)(53)*

*Banning, E.B. and Brian F. Byrd (Arizona)*

**RENOVATION IN DOMESTIC ARCHITECTURE: THE CHANGING RESIDENTIAL UNIT AT PPNB 'AIN GHAZAL, JORDAN.**

One of the most intriguing aspects of Pre-Pottery Neolithic B (PPNB) architecture at 'Ain Ghazal was the frequency of room alteration during structures' use-lives. This paper explores the possibility that renovations are due to changes in the composition of the household groups during the family 'developmental cycle,' and compares this with some alternative hypotheses.(3)

*Barnett, William K. (Boston)*

**THE PHYSICAL ANALYSES OF IMPRESSED POTTERY FROM CALDEIRAO AND THE PORTUGUESE EARLY NEOLITHIC.**

Recent excavation at the Gruta do Caldeirao has produced the first example of a stratified Early Neolithic site in Portugal. Technological and thin-section analyses of this small ceramic assemblage and comparison to local clays can be used to propose that *Cardium* impressed pottery appeared earlier than other impressed styles and had a more extensive distribution pattern. This information is

integrated with models of settlement, economy and pottery use during the Early Neolithic in Portugal and the western Mediterranean.(16)

*Bartram, Laurence E., Ellen M. Kroll, and Henry T. Bunn (Wisconsin, Madison)*

**VARIABILITY IN CAMP STRUCTURE AND FOOD REFUSE PATTERNING AT KUA SAN HUNTER-GATHERER CAMPS.**

Observations and maps of Kua San residential and hunting camps in the east central Kalahari, Botswana, provide insight into the formation and disintegration of behaviorally meaningful spatial relationships among facilities, artifacts, and refuse. Variability in household structure and camp layout is strongly seasonal. Linear rather than circular camps at Kua San dry season camps contrast with 'Kung San camps of the same season, as dictated by the distribution of rare shade trees. Activity locations vary both daily and seasonally relative to shade and weather conditions. The effects of scavengers on bone refuse distributions are also discussed.(44)

*Bar-Yosef, Ofer (Hebrew, Jerusalem)*

**THE MEDITERRANEAN LEVANT DURING THE LAST GLACIAL MAXIMUM.**

Cold and dry conditions prevailed over most of the Levantine Region. The three vegetational belts recognized today as Mediterranean, Trans-Turanian and Sahara-Arabian had different spatial distributions. Palynological and geomorphological evidence points to the expansion of deserts, and the retreat of shrubland and woodland associations to the coastal ridges and plain. The small number of known Epi-palaeolithic sites exhibit considerable local typological diversity which may express a degree of sedentism which originated under stress conditions. Exchange of Mediterranean marine shells for personal ornaments and similarities in lithic reduction techniques testify to regional networks. However, when compared with preceding and succeeding periods, this time span indicates a diminution in the overall occupied territory, reduction in interregional contacts and possibly a decrease in population size.(20)

*Bar-Yosef, O. (see Belfer-Cohen, A.)(4)*

*Baugh, Timothy G. (Colorado, Boulder) and Fred W. Nelson (A@G Analyses)*

**EXCHANGE AND OBSIDIAN: CHANGING TRADE STRUCTURES IN THE SOUTHERN PLAINS.**

The study of archaeological obsidian from a series of southern Plains sites has revealed some rather interesting results. Prior to A.D. 1400 (from Late Archaic through Early Plains Village periods), obsidian artifacts have been traced to northwestern Plains and/or Plateau sources. After A.D. 1450 (during the Middle Plains Village period), this material is derived almost exclusively from southwestern sources (especially sources within the Jemez Mountains of New Mexico). This paper will examine the changing dynamics of southern Plains exchange using climatic, ecological, and social variables.(40)

*Bawden, Garth (New Mexico)*

**DOMESTIC SPACE AND SOCIAL ORGANIZATION IN THE OSMORE DRAINAGE OF SOUTHERN PERU.**

This paper investigates the relationship between the design of domestic architectural space and human social organization. Basic to the thesis of this study is the belief that the specific use of domestic space is determined by prevailing modes of social behavior in a particular community, which in turn are shaped by wider dominant organizational patterns. On the diachronic level, it follows that modification in domestic space through time as seen in the archaeological record is due either to evolutionary change within a society or to its replacement by a society with different organizational norms. Archaeological data derived from recent work in the Osmore drainage of southern Peru are used to explore these questions and to study the nature of social evolution and human interaction in the Southern Andes.(27)

*Beaudry, Marilyn P. (UCLA) and Eugenia J. Robinson (Tulane)*

**OPERATIONALIZING THE CERAMIC SPHERE CONCEPT.**

The 1965 Maya Ceramic Conference defined a ceramic sphere as "... existing when two or more complexes share a majority of their most common types ... implying high content similarity at the typological level." Recent work in Mesoamerica—the South Coast of Guatemala and the Sula Valley of Honduras—has applied this concept to investigate cultural interaction. This paper describes the methods used, the problems encountered, and the assumptions made in using the concept. Conclusions about interaction in these two areas are discussed in terms of what the ceramic sphere concept contributes to this type of analysis.(57)

*Belfer-Cohen, Anna and Ofer Bar-Yosef (Hebrew, Jerusalem)*

**LEVANTINE UPPER PALAEO-LITHIC CAVE SITES - A REAPPRAISAL.**

The paper discusses the features of Upper Palaeolithic occupations in Levantine cave sites prior to 20,000 B.P. Aspects of site size, relative density of artifacts, the main traits of lithic assemblages, bone and antler industries, as well as ochre finds, grinding stones, and human remains are briefly reviewed. It is demonstrated that cave occupations present a subsystem within a much larger adaptive system. Changes in the nature of cave utilisation are interpreted as resulting from changes in overall spatial organization of Levantine Upper Palaeolithic entities.(4)

*Bentley, Gillian R. (Chicago)*

**THE CORPORATE STRUCTURE OF EARLY BRONZE AGE URBAN SOCIETY AT BAB EDH-DHRA', JORDAN.**

The archaeological and skeletal data excavated from the Early Bronze Age shaft tombs at Bab Edh-Dhra', Jordan, together with a comparison of other contemporary, regional, mortuary sites, suggest that a highly corporate, unstratified group structure characterizes the social organization of this period. These data imply that kin and polity were not incompatible features during the Early Bronze phase of urban development, nor were the acquisition of social status and the growth of hierarchism inevitable concomitants to increased social complexity.(3)

*Bermann, Marc (Michigan)*

**DOMESTIC OCCUPATION AT A REGIONAL TIWANAKU SITE.**

Although Tiwanaku monumental architecture has been well described, the domestic component of this altiplano culture is relatively poorly known. Recent excavations at the regional Tiwanaku site of Lukurmata have provided further insight into rural Tiwanaku settlement during the Tiwanaku IV and V periods (400-1200 A.D.). Complete excavation was made of Tiwanaku habitations associated with a characteristic Tiwanaku civic-ceremonial structure. This has allowed examination of Tiwanaku domestic unit sizes, ceramic preferences, and household artifact assemblages. These data form the basis for an interpretation of Tiwanaku provincial community organization.(52)

*Bernstein, David J. and Peter E. Siegel (Centro de Investigaciones Indígenas de Puerto Rico, Inc. and SUNY-Binghamton)*

**SITE STRUCTURE, SETTLEMENT ORGANIZATION, AND SAMPLING: A CASE STUDY FROM THE NORTH COAST OF PUERTO RICO.**

Traditionally, in Puerto Rico and throughout the Antilles, little attention has been devoted to understanding the structure and organization of prehistoric settlements. The present study addresses these issues by providing information on the size and structure of a multi-component Saladoid/Elenoid site located on the north coast of Puerto Rico. Results of a two stage sampling program are presented. The first stage employs a series of mechanically excavated auger pits and is found to provide a coarse-grained view of the internal organization of the prehistoric settlement. Intensive excavation in selected areas of the site supplies detailed information on residential, cemetery, and refuse disposal locales.(37)

*Berry, Sarah and D.B. Bamforth (California, Santa Barbara)*

**MICROWEAR ANALYSIS IN THE 1980S.**

Microwear polishes in conjunction with other traces of use, including striation and edge damage patterns, can yield reliable information on the specific kinds of materials on which prehistoric stone tools were used. This method, pioneered by L.H. Keeley, rests on observations of tool edges at magnifications from 100x to 400x. A series of slides and experimental tools will illustrate the types of polishes and other microscopic traces on tool surfaces resulting from some common processing procedures. Some of the limits on inferences based on polish appearance will be discussed.(53)

*Bettinger, Robert L. (California, Davis)*

**PROGRESS, HOMEOSTASIS, CONTRADICTION, AND INHERITANCE: MODELS OF HUNTER-GATHERERS IN HISTORIC PERSPECTIVE.**

Because anthropology has always portrayed hunter-gatherers to suit its theories, the changing manner in which certain key concepts have been applied to these societies is particularly instructive regarding the intellectual history of our discipline. In this sense the current debate over the presence and intensity of inequality among hunter-gatherers is best seen not as an argument about fact but about theory and in particular an argument that pits neo-Marxist theory against neo-Darwinian theory. The former emphasizes social relations and internal transformations, the latter technology, environment, and selection.(58)

*Beukens, Roelf P. (Toronto)*

**RADIOCARBON DATING WITH ACCELERATOR MASS SPECTROMETRY.**

The detection of radiocarbon with Accelerator Mass Spectrometers allows smaller and older samples to be dated to the same precision as with conventional radiocarbon dating techniques. The use of small microgram-sized samples of bone, wood, plant remains, seeds, charcoal, steels, and shells or foraminifera solves, in many cases, the problem of which material should be selected in the field for dating. The experience with accelerator mass spectrometric dating over the last two years has provided better answers to questions of optimal number of samples and optimal sample materials.(23)

*Bey, G. (see Ringle, W.M.)*(57)

*Biddick, Kathleen (Notre Dame)*

**PEOPLE AND THINGS: TERRITORIALIZING SOCIAL REPRODUCTION IN EARLY EUROPEAN DEVELOPMENT.**

The archaeological study of state formation in early medieval Europe has overturned models of European development long propounded by historians. This paper considers the crucial intersection of state power and household formation in medieval England. It argues that the state did not succeed in territorializing the household until the turn of the thirteenth century. The paper then considers the implications of territorializing the household for social reproduction. The paper concludes with suggestions for rephrasing models of development in medieval England. The historic processes of personification and objectification at work in the early English economy have comparative relevance for the study of contemporary indigenous economies.(48)

*Bieseke, Megan (Rice)*

**ORAL LEARNING AND THE INTERPRETATION OF ROCK ART.**

Both rock art and folklore may be considered phases in the systematics of non-literate communication. The understanding of each contributes to the understanding of the other: they share the basic processes of signification and transmission, and oral hermeneutics encompasses interpretation in both media. Kung folklore research indicates narrative information processing bears marked similarity to information storage and innovation in visual media. In fact, since images of rock art and folklore in southern Africa are often cross-referring, important correlations may be made among these images. Past quantitative studies in both fields suggest computer tools for interpretation. Reference is made to an experimental project in the Lower Pecos River area, Texas, on computer storage and manipulation of computer graphics and related documentation. The implications of this approach for southern African research are explored. The paper is organized around a general discussion of the evolutionary success of hunter-gatherer communication systems.(38)

*Bigelow, Gerald E. (Rochester Mus.)*

**TAXATION, NUTRITION, AND TRADE: ISLAND ECONOMY IN THE MIDDLE AGES.**

Archaeological data indicate that major changes occurred in the domestic economies and material culture of the inhabitants of the Shetland Islands c. 1000-1500 A.D. Artifactual evidence reveals a growing integration with Continental Europe during this period and documentary sources suggest that trade in dried fish was the primary integrating force. When viewed in light of local ecology, and documented contemporary changes in regional politics and commerce, these developments appear to be adaptive responses to stresses from a) demographic expansion, b) the establishment of taxation, and c) the limited range of local food resources.(21)

*Binford, L.R.*(9)

*Binford, L.R.*(20)

*Binford, Michael W. (Harvard), Mark Brenner (Florida), and Barbara Leyden (South Florida)*

**PRELIMINARY STUDIES OF TIWANAKU LIMNOLOGY.**

This paper presents preliminary results of a limnological study in the Lake Titicaca basin. Samples were taken near the Tiwanaku sites of Pajchiri and Lukurmata, and in a small lake, Chullumpi Kota. These yielded 7 sediment/water interface cores (estimated to represent 250-1000 years of sedimentation) and one 5.07-m core which may contain a record of the past 5000 years. The paper reports on results of <sup>210</sup>Pb and <sup>14</sup>C dating, physical and chemical analyses, and pollen analysis. The data will allow examination of hypotheses concerning nutrient efficiency of various kinds of Tiwanaku agriculture, the effects of different land uses on the terrestrial system, and inference of pre-civilization environmental conditions.(52)

*Bishop, Charles A. and M. Estellie Smith (SUNY, Oswego)*

**NORTHEASTERN ALGONQUIAN EGALITARIANISM: ABORIGINAL OR POST-CONTACT?**

Leacock and Lee (1982) have defined the characteristics of egalitarian societies (e.g., Cree and Montagnais foragers) assuming that historically documented inequality is due to colonialism or observer bias. Such attempts counterproductively ignore, explain away and/or gloss over significant autochthonous disparities of sociocultural 'egalitarianism' that, in point of fact, became elaborated in early contact times. Indeed, in fostering a new variant of individualism, colonialism simultaneously eroded and introduced/enhanced various types of inequality that may have been far more common than those that fit the egalitarian ideal. This can be tested archaeologically.(58)

*Bishop, R.L. (see Crown, P.L.)(50)*

*Black, L.T. (see Aigner, J.S.)(7)*

*Black, L.T. (see McCartney, A.P.)(7)*

*Blake, Michael (UBC, Vancouver) and John E. Clark (New World Archaeological Foundation - BYU)*

**BARRA, OCÓS, AND EARLY OLMEC SOCIETIES OF COASTAL CHIAPAS, MEXICO.**

Survey and excavation of Early Formative sites along the Pacific Coast of Chiapas, Mexico, during 1985, provide evidence of a continuous socio-political development from Barra through Ocós to early Olmec times (ca. 1600 B.C. to 800 B.C.). Forty new Barra, Ocós, and Cuadros phase sites were discovered. Excavations at several of these sites allowed us to refine the characteristics and chronological placement of the three phases. An entire Ocós-phase house floor and associated features were excavated, providing details of Early Formative house styles and construction techniques. Excavation of house floors and middens resulted in the recovery of subsistence remains—including 75,000 animal bones and many carbonized fragments of maize, beans, and other seeds. These are the earliest cultivated plant remains recovered from sedentary communities in southeastern Mesoamerica.(45)

*Blankholm, H.P. (Aarhus, Denmark)*

**TOWARDS A BEHAVIORAL INTERPRETATION OF EARLY POSTGLACIAL HUNTER-GATHERER SITES IN SOUTHERN SCANDINAVIA.**

The archaeological record of early postglacial hunter-gatherers (10,500-6,500 B.C.) in Southern Scandinavia is extremely rich. Yet, lacking graves and cemeteries, most information on the organization of the society has to be extracted from the settlements. Recent research has revealed a series of analytically delineated hut floors and established the size of the minimal social unit. Further, analysis has been carried out in search of intrasite behavioral patterns related to site use and social dimensions. These are considered important short-term objectives for the ultimate resolution of settlement systems and social patterns. Results will be outlined and future prospects discussed.(44)

*Bogucki, Peter (Princeton)*

**CHANGING ADAPTIVE STRATEGIES AND THE EARLIEST FARMING COMMUNITIES OF THE NORTH EUROPEAN PLAIN.**

The abandonment of Neolithic sites in temperate Europe is often attributed to relatively sudden processes, such as famine, disease, or attack. Recently, archaeologists working in several parts of the world have approached site abandonment in terms of two alternating adaptive strategies, which Upham has termed "power" and "efficiency" strategies. Focusing on the Neolithic settlement at Brzesc Kujawski (Poland) and its environs, this paper argues that its inhabitants had embarked on a "power strategy" that eventually necessitated a shift in their approach to resource exploitation to an "efficiency strategy" and discusses the implications of this shift for the development of the earliest agrarian societies on the North European Plain.(16)

*Boisvert, Richard A. (Ohio Historic Preservation Office)*

**CONFLICT, COOPERATION AND COMPLIANCE: A SUMMARY OF RECENT ARCHAEOLOGICAL INVESTIGATIONS IN THE OHIO COAL FIELDS.**

Prior to September 1985, archaeological surveys conducted in anticipation of surface mining were not being conducted on non-federal lands in Ohio. Since that time there has been an explosion of investigations with an associated increase in archaeological information. Events associated with this change reveal a complex history of confrontations and negotiations among archaeologists, regulatory officials and surface miners. This experience in Ohio is summarized and a prognosis for future developments is offered.(18)

*Bond, L. (see Wilson Yang, K.M.)(43)*

*Borstel, Christopher L., Keith P. Jacobi, and Geoffrey W. Conrad (Indiana)*  
**SAN ANTONIO: ANALYSIS OF THE EXPOSED ARCHITECTURE AT AN ESTUQUINA PHASE SITE, MOQUEGUA, PERU.**

San Antonio, an Estuquina phase site (AD 1300-1500), is an agglutinated complex of over 200 walled spaces. Analysis of surficial architecture shows that these spaces can be divided into rooms, terraces, plazas, and corridors. Patterned variations in these features suggest that the site consists of three functionally distinct sectors. Details of wall construction indicate that the site grew from several original nodes and that occupants first delineated large spaces and later subdivided them. This paper discusses the cultural implications of the site plan and the methodological problems encountered in the analysis of exposed architectural features.(49)

*Boster, M.A. (see Cheek, A.L.)(18)*

*Bouey, Paul D. (Los Angeles Museum of Natural History)*  
**THE EVOLUTION OF HUNTER-GATHERER EXCHANGE ECONOMIES: SOCIAL INTENSIFICATION IN THE NORTH COAST RANGES OF CALIFORNIA.**

Throughout the 5000 year prehistory described for this portion of the North Coast Ranges, archaeological evidence indicates that as population numbers increased and production processes intensified, the exchange transactions became more inclusive and began to reflect varied types of social interaction. The patterns depicted are consistent with the expectations of a process of political-economic intensification and reflect changes resulting from indigenous developments and historical events. Until recently, such a pattern of institutional growth was considered exceptional for food foragers, but it is becoming more apparent now that prehistoric hunter-gatherers exhibited a broad range of organizational forms. This implies that archaeologists must consider the non-egalitarian social and political contexts, not only to evaluate the evolution of food foragers, but also to understand the general development of political-economic structures.(12)

*Bourque, Bruce J. (Maine State Museum, Augusta)*

**EXCHANGE PATTERNS IN NORTHEASTERN NORTH AMERICA.**

Some evidence for exchange systems is found throughout prehistoric times in the Maine area. However, such systems are much more apparent in the archaeological record during certain specific periods. These include the Paleoindian, late Archaic, early ceramic and late ceramic periods. A final native exchange network dating to the early years of the 17th century has recently been recognized. This paper summarizes our current understanding of the prehistoric networks and evaluates ethnohistoric data as a model for their elucidation.(40)

*Bove, Frederick J. (California, Santa Barbara)*

**TEOTIHUACAN IMPACT ON THE PACIFIC COAST OF GUATEMALA: MYTH OR REALITY?**

Widespread cultural disruption occurs on the South Coast of Guatemala in the transitional stage between the Terminal Formative and Early Classic. Regional settlement patterns and related socio-political organizations undergo a traumatic transformation. These changes may be related to the emergence of Teotihuacan as a center of pan-Mesoamerican significance. A summary of possible Teotihuacan contacts on the Pacific Coast during this period and the variability in the types of interaction is presented along with the results of an active regional research project centered at the major Early Classic coastal site of Balberta. The significance of these data for different models of Teotihuacan's foreign relations and local evolutionary change are discussed.(11)

*Boxt, Matthew (UCLA)*

**SARTENEJA, BELIZE AND THE MAYA POSTCLASSIC.**

1986 excavations at Sarteneja, Belize revealed a small Late Preclassic and Classic Period settlement that grew substantially in size and importance during the Postclassic. Postclassic Sartenejenos exploited the far northeastern Belizean littoral and adjacent barrier reef as their subsistence economy diversified; exotic artifacts established trade links between the Sarteneja Maya and other Mesoamerican peoples. It is argued that Sarteneja's strategic location on Chetumal Bay contributed to its cultural development. The role of Sarteneja in the Maya Postclassic is discussed.(47)

*Boyd, Charles Clifford (Radford)*

**CULTURAL SELECTIONISM AND THE PREHISTORY OF UPPER EAST TENNESSEE AND ADJACENT REGIONS.**

Collections of lithic and ceramic artifacts from sites in upper East Tennessee, Southwest Virginia and western North Carolina are examined in light of current theories of cultural selectionism. This

research is a case study of these theories, applying them to the analysis of temporal changes in material culture. Nearly 50 radiocarbon dates are used to temporally order selected artifact collections. Change over time in the functional and stylistic attributes of the artifacts from these collections is then documented by frequency distributions, bivariate plots and multivariate statistical analyses. This study concludes that cultural selectionism provides the best explanations for the observed changes.(32)

*Bradley, Ronna J. (Arizona State, Tempe)*

**MARINE SHELL ORNAMENT PRODUCTION AT CASAS GRANDES, CHIHUAHUA: THE ROLE OF SHELL IN EXCHANGE SYSTEMS IN NORTHWEST MEXICO AND THE SOUTHWEST.**

The site of Casas Grandes is very large and complex in relation to others along the northwestern frontier of Mesoamerica, and has been described as a trading center where trade items were accumulated for redistribution. Shell constitutes the majority of exotic goods stockpiled at the site, and has the potential to address directly questions concerning ornament production and shell exchange systems along the northern frontier. An examination of shell procurement techniques is conducted, and the distribution of shell ornaments is assessed inter-regionally in order to gain a better understanding of the actual role of Casas Grandes shell in the related areas. Models which address the nature of exchange systems will be evaluated for their applicability in describing interactive relationships on the northwestern Mesoamerican frontier.(40)

*Brady, James E. (UCLA)*

**TRACE ELEMENT ANALYSIS OF NAJ TUNICH OBSIDIAN: PROTOCLASSIC TRADE IMPLICATIONS.**

Naj Tunich, a large ceremonial cave in southeastern Peten, Guatemala, has produced the largest and best preserved collection of Protohistoric ceramics. Trace element analysis performed on obsidian from the site found both El Chayal and Ixtepeque sources represented. Relative dating obtained through obsidian hydration reveals that about half of the obsidian which is contemporaneous with the Protohistoric ceramics is from Ixtepeque. This suggests that trade was being carried on with the southeastern periphery at the time when traits from that area were being introduced into the Maya lowlands.(57)

*Brand, U. (see Rollins, H.B.)(6)*

*Brenner, M. (see Binford, M.W.)(52)*

*Brinker, Ruth A. (Indiana, Bloomington)*

**CULTURAL RESOURCES IN THE COAL FIELDS OF INDIANA.**

Public interest and the active participation of avocational and professional archaeologists are the key factors in the progress which has occurred relative to cultural resources in the coal producing area of Indiana. Without regulatory authority, this progress has taken several rather indirect pathways. Methods include a lands unsuitable for mining petition process, informal conferences between coal producers and archaeologists, and agreements between the regulatory authority (Division of Reclamation) and coal producers.(18)

*Brockington, Donald L. (North Carolina, Chapel Hill), David Pereira, Ramon Sanzentea, and Ricardo Cespedes (Universidad Mayor de San Simon, Cochabamba, Bolivia)*

**A PRELIMINARY REPORT ON FORMATIVE CERAMIC SEQUENCES IN COCHABAMBA, BOLIVIA.**

Excavations were conducted from 1984-1986 at four sites in the Cochabamba Valley and the Mizque Valley of the eastern Andes. The purpose was to elucidate the ceramic sequence from the poorly-known Formative period of this zone. Two Formative sequences are defined for the Formative of the Cochabamba Valley and are radiocarbon dated to 1,000 B.C. to 600 A.D. In the Mizque Valley one Formative sequence is cross-dated with the Cochabamba Valley. The ceramics from this zone indicate that during the Formative there existed localized traditions which may reflect small sociopolitical groupings.(49)

*Bronson, B.(24)*

*Brookes, Ian A. (Toronto)*

**HOLOCENE SEDIMENTS OF DAKHLEH OASIS REGION, S.C. EGYPT.**

Holocene sediments of the Dakhleh Oasis region (25.5°N, 29°E) are currently grouped into six informal stratigraphic units using sedimentological and age data. Five are aeolian and one lacustrine. Ages come from <sup>14</sup>C dates on ostrich eggshell from occupation sites more or less closely related to sedimentary contexts, and from stylistically dated tools, pottery and structures. Aeolian units accumulated in the intervals <1000, ca. 1850-1550, ca. 4200, ca. 5800-5200, and older than 7100 years BP.

Lacustrine sediments, recorded only from a plateau basin, shortly pre-date 8300 years BP. A current problem is reconciliation of faunal evidence of early/mid-Holocene moisture with sedimentary indications of arid aeolian conditions. Another is the apparent absence of Holocene lakes from a spring-fed lowland, 30 km from the plateau lake.(14)

*Brookes, S.O. (see Johnson, J.K.)(40)*

*Brooks, Alison S. (George Washington)*

**INTERIOR AFRICA: CENTRAL AND SOUTHERN AT 18,000 B.P.**

Knowledge of hunter-gatherer populations of the African interior at 18,000 years B.P. has been extremely limited by lack of exploration. Climatic data suggest that this time represented the onset of generally more arid environments in many areas and resulted in lower population densities and a non-existent or "invisible" record of human occupation. Recent data suggest however that river and lakeshore areas, especially in central Africa, may have been intensively utilized as early as the last glacial maximum.(20)

*Brown, R.B. (I.N.A.H., Central Regionales) and L.F. Nieto G. (I.N.A.H., Guanajuato)*

**SAN MIGUEL VIEJO, MPIO. ALLENDE, GUANAJUATO, MEXICO.**

The "Proyecto Piloto del Atlas Arqueologico" identified San Miguel Viejo as the regional center in the middle rio Laja. The site is clearly Mesoamerican with its truncated pyramids, sunken patios, plazas, altars and terraces. Superficial analysis of the ceramics and architecture indicate that the site was occupied between 600-950 AD; or, the apogee of Teotihuacan and the rise of Tula. As such San Miguel Viejo's decline probably corresponds to the initial Chichimec invasions of Central Mexico. During the winter 1986/7 the "Museo Casa Allende" undertook a salvage operation on part of the site to clarify the local chronology and analyze the habitational patterns.(30)

*Bruhns, K.O. (San Francisco State)*

**LONG DISTANCE EXCHANGE IN THE LATE FORMATIVE ECUADORIAN HIGHLANDS.**

Ongoing excavations at Pirincay, a Late Formative site in the southern Ecuadorian highlands, suggest that long distance exchange was an integral part of Ecuadorian economies by the mid-first millennium B.C. However organized, this trade seems to have involved large scale specialist manufacture of sumptuary items, and movement of both finished products and raw materials between the highlands, the coast and the tropical forest as well as between the intermontane basins. Suggestions concerning the importance of east-west running river valleys as trans-andean corridors would seem to be validated for this time period.(28)

*Brunson, J.L. (see Merbs, C.E.)(34)*

*Brush, D. (see Spiess, A.E.)(46)*

*Bunn, H.T. (see Bartram, L.E.)(44)*

*Burgar, R.W.C. (The Metropolitan Toronto and Region Conservation Authority)*

**THE SPATIAL ORGANIZATION OF THE BATTEN KILL PHASE IN SOUTHERN ONTARIO.**

A rigorous quantitative methodology is defined in order to uncover spatial variation of the diagnostic artifact of the Batten Kill phase, the Genesee projectile point. In a multivariate analysis of 37 design variables on several hundred Genesee points, evidence is presented which supports statistically significant regional variation of shoulder and stem elements of this artifact. This variation is found to cluster in 10 regions in Southern Ontario and is interpreted as representing discrete hunting ranges.(34)

*Burns, G. (see Wilson Yang, K.M.)(43)*

*Bush, David R. (Case Western Reserve)*

**CULTURAL RESOURCE MANAGEMENT STUDIES ON SURFACE MINING PROJECTS—EXAMPLES FROM OHIO AND KENTUCKY.**

Recent policy changes by the State Regulatory Authority in Ohio have resulted in the first cultural resource studies being conducted on proposed surface mining permit areas. Since the fall of 1985, thousands of acres have been surveyed resulting in the identification of many significant archaeological sites. Kentucky's State Regulatory Authority has yet to require CRM studies on proposed surface mining permit areas. This paper compares the findings in Ohio with those from surveys in Kentucky (surveys concerning land exchanges between the Daniel Boone National Forest and coal companies) emphasizing the success that can be gained.(18)

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

**INFERRING SITE FUNCTION, SEASONALITY, AND BUTCHERING PATTERNS WITH SALMONID REMAINS.**

Most previous treatments of archaeological salmonid remains in the Pacific Northwest use faunal data to address subsistence issues. The ubiquity of such remains in northwestern sites, however, suggests they have great potential to inform on site function, seasonality of use, and butchering patterns, much as bison remains have been successfully employed in other areas of the western United States. This paper demonstrates how element survivorship, specimen dispersion, bone fragmentation, size class, and species composition may be used to identify site function, seasonality, and butchering patterns through discussion of the salmonid remains from a Puget Sound shell midden, the Duwamish No. 1 Site.(25)

*Byland, Bruce E. (Lehman, CUNY) and John M.D. Pohl (UCLA)*

**THE REORGANIZATION OF POLITICAL CONTROL IN THE TILANTONGO VALLEY FROM FORMATIVE TO POSTCLASSIC TIMES.**

Changes in the distribution of settlements in the Tilantongo Valley from Formative to Postclassic times suggest two major reorganizations of political control in this part of Oaxaca. Explanation of these transitions can be sought through an examination of changing patterns of conflict and alliance within the Mixteca Alta and of changing interaction with the valley of Oaxaca. Ceramic and settlement pattern analyses are employed to simultaneously examine the local and regional sources of change in the context of tremendous political upheaval depicted in the Mixtec historical codices during these periods.

*Byland, B.E. (see Pohl, J.M.D.)*(5)

*Byrd, B.E. (see Banning, E.B.)*(3)

*Cahen, D. (IRScNB, Belgium)*

**SPATIAL ORGANIZATION OF THE LBK VILLAGE OF DARION (BELGIUM).**

The LBK village of Darion dated at about 6200 B.P. covers some 2 ha. It is surrounded by a ditch and a palisade with 3 main entrances. The interior space is divided in two zones. The largest one has no houses and contains only a few pits. Some of these pits yield specialized material such as flint waste from the preparation of blades, indicating that flint knapping took place in that part of the dwelling. The southern zone comprises 4 houses surrounded by numerous rubbish pits. Palynological analysis demonstrates that the northern zone is devoted to pasture while the southern one is almost devoid of vegetation. Cereal fields extend along the western and southern sides of the village, between the houses and the southern part of the palisade. Pedological studies demonstrate that the neolithic site is located on a pedological margin, a situation which apparently is often selected by LBK peoples in Belgium. The spatial organization of the Darion village presents several similarities with that of the much more extended and more densely constructed LBK village of Köln-Lindenthal, in Germany. Both are fortified sites with an interior opposition between a constructed southern part and a northern part devoid of habitation.(44)

*Calogero, Barbara A. (Connecticut)*

**LOCAL RESOURCE SELECTION - CONNECTICUT BASALTS.**

For 8,000 years, inhabitants of the Connecticut and Farmington River valleys have utilized locally available basalt for making stone tools. The only sources of basalt in Connecticut are a volcanic ridge and its associated dikes and sills in the central part of the state. The ridge is composed of three separate lava flows which can be distinguished morphologically and by trace element analysis. Country rock and metamorphosed sediments are additional resources utilized by local inhabitants. The question of preference and special selection of certain basalts and contact-metamorphosed rock as raw material for stone tools will be discussed.(31)

*Camilli, E.L. (see Ebert, J.I.)*(43)

*Cannon, Aubrey (Cambridge)*

**THE TEMPORAL DIMENSION IN THE ANALYSIS OF STYLE.**

The study of temporal changes in the frequency and variety of material culture styles is a key to understanding the processes of socioeconomic change. The development sequence of temporal change is also the context necessary for establishing the meaning of synchronic stylistic variability. A temporal perspective is especially critical for interpreting the use of material culture as a medium for the expression of individual identity and social status. The significance of time in the study of style is illustrated through the examination of variability in nineteenth century English grave monuments.(32)

*Carlisle, R.C. (see Adovasio, J.M.)*(51)

*Carlson, Roy L. (Simon Fraser)*

**PREHISTORIC EXCHANGE ON THE NORTHWEST COAST.**

Trade in obsidian both along the coast and between the coast and the interior can be documented for the last 8000-9000 years. Exchange of other commodities—quartz crystals, soapstone, nephrite, dentalium and ceremonial objects—is only known from about 3000 B.P. The archaeological record is non-specific concerning the mechanisms of exchange. However, the overall patterning of Northwest Coast society seems to have changed little during the last 3000 years preceding contact, and those historically known mechanisms of exchange based on seasonal mobility and reciprocal obligations between kin groups probably go back at least that far.(40)

*Carmichael, Patrick H. (Calgary)*

**NASCA ARMED CONFLICT.**

Early Intermediate Period iconography from the Peruvian south coast suggests armed conflict was a prominent feature in Nasca society. This paper examines depictions in various craft mediums and compares these with artifactual and skeletal evidence. New data are presented and the nature of armed conflict in terms of its causes, scale, and directions through time is considered. Lessons from ethnography and art history are taken into account and earlier models are reexamined.(13)

*Carr, Christopher (Arizona State)*

**INTERPRETING ARTIFACT CLUSTERS AROUND HEARTHS AT PINCEVENT HABITATION NO. 1.**

Artifact clusters around hearths can indicate numerous past activities and formation processes. Assigning appropriate meaning to them requires that site-specific evidence derived through exploratory data analysis, as well as multiple alternative interpretive models, be used. Spatial patterning among artifacts and features, including asymmetry patterns within polythetic depositional sets, cluster shape, border characteristics, and size, artifact conjoin patterns, and stratigraphy are examined for the French Magdalenian reindeer hunting camp, Pincevent habitation no. 1, to illustrate this. Binford's and Leroy-Gourhan's alternative interpretations of the Pincevent remains are considered.(44)

*Carr, Kurt W. (Pennsylvania Historical and Museum Commission)*

**THE ROLE OF QUARRY UTILIZATION IN PALEOINDIAN SETTLEMENT PATTERNS.**

In eastern North America there are two views concerning the significance of lithic resources in the Paleoindian seasonal round. The traditional model argues that annual movements involved traveling between quarries separated by hundreds of miles. In contrast data from the Flint Run Complex suggests that seasonal movements centered around one quarry and band territories were relatively small. The reduction sequence and other site activities from the Shoop site will be compared to sites from the Flint Run Complex to further investigate the role of quarry sites in the Paleoindian seasonal round.(46)

*Cavallaro, Raffael (Harvard) and Eric C. Gibson (Trinity)*

**THE SCAVENGING HYPOTHESIS REVISITED, OR, PUTTING "MAN" BACK IN EARLY MAN STUDIES.**

Replication of Binford's work as described in *Bones: Ancient Men and Modern Myths* shows that his analyses have problems. Prominent among these are: 1) the small number and inappropriate nature of the comparative actualistic studies used and, 2) less than rigorous statistical treatment of the data. When these flaws are considered, claims concerning the contributions of non-hominid agents to early man sites appear greatly weakened if not wholly unsupported. However, Binford's aims and approaches are still an important step which should be followed up by more rigorous studies and compared to actualistic analyses such as Hill's (1975) work on East African vertebrate taphonomy.(32)

*Cervone, G.C. (see Sempowski, M.L.)*(36)

*Céspedes, R. (see Brockington, D.L.)*(49)

*Chang, Claudia (Sweet Briar)*

**THE VISIBILITY OF PASTORAL SITES: AN ETHNOARCHAEOLOGICAL CASE FROM GREECE.**

Recently archaeologists have noted the difficulty of locating and identifying pastoral sites during regional surveys. This paper argues that the invisibility of pastoral sites stems from inadequacies in conceptual and methodological frameworks used to reconstruct prehistoric pastoralism. It has been assumed that highly mobile pastoral populations left only ephemeral evidence on the cultural landscape. Also, zooarchaeological approaches to pastoralism have been considered the most appropriate methods for analyzing pastoral production. Such assumptions have caused archaeologists to overlook the pastoral site as a useful unit of analysis. Ethnoarchaeological observations of modern pastoral

sites in Greece coupled with a review of recent advances in pastoral site analysis suggests the visibility of such sites in regional settlement systems.(24)

*Charles, Douglas K. (Wesleyan)*

**A THEORY OF ARCHAEOLOGY AND THE BURDEN OF HISTORY.**

A theory of archaeology (and history) must encompass the transition from non-human to human as well as the rise of the agricultural state. The focus of the theory must be on change, not subject matter, analogous to the manner in which Darwinian theory can accommodate any grade of biological complexity. Neither the New Archaeology, grounded in a simplistic application of evolutionary theory to socio-cultural phenomena, nor a recent alternative derived from post-Marxist structuralism have sufficient scope. A broader theory of change appreciating the historical constraints on operational configurations and incorporating the role of ideology is presented.(32)

*Chase, A.F. (see Chase, D.Z.)(47)*

*Chase, Diane Z. and Arlen E. Chase (Central Florida - Orlando)*

**ROUTES OF TRADE AND COMMUNICATION AND THE INTEGRATION OF MAYA SOCIETY: THE VISTA FROM SANTA RITA COROZAL, BELIZE.**

Santa Rita Corozal is juxtaposed between the New and Hondo Rivers and Chetumal Bay. This location in northern Belize allowed access to both sea and riverine trade. Santa Rita Corozal flourished during the Early Classic and late Postclassic, two areas characterized by external influences and/or trade. While river and ocean routes may be used to predict trade, such routes are also indicative of general networks of communication. The use and nonuse of such routes throughout the prehistory of Santa Rita reveals the site's changing role in wider Maya culture.(47)

*Chase, Philip G.(Arizona) and Harold L. Dibble (Pennsylvania)*

**RELIGION AND SYMBOLISM IN THE MIDDLE PALEOLITHIC: A LOOK AT THE EVIDENCE.**

Since the early years of this century, Middle Paleolithic scholars have presented evidence that suggests the existence of various kinds of symbolic and/or ritual behavior at that time: cave bear worship, ritual burials, etc. Obviously the presence or absence of such behavior has major implications for our understanding of Middle Paleolithic adaptations. How convincing is the evidence?(16)

*Cheek, Annetta L. and Mark A. Boster (Office of Surface Mining Reclamation and Enforcement, Department of the Interior)*

**COAL MINING AND ARCHAEOLOGY: OSMRE'S VIEW.**

The Office of Surface Mining recently promulgated regulations on the protection of historic resources during coal mining operations. Archaeologists and the public can influence how archaeological resources are treated during mine permitting. However, permits are generally issued by State regulating authorities, and Section 106 of the National Historic Preservation Act does not apply directly to permit issuance. Archaeologists seem to be having a hard time interacting effectively with State mining authorities and State permitting processes. This paper presents the views of the Office of Surface Mining on the role of archaeologists in the State permitting process.(18)

*Chippindale, Christopher (Cambridge)*

**WHAT'S IT A PICTURE OF? IDENTIFYING PREHISTORIC PICTURES IN THE SOUTHERN ALPS.**

Identifying the subjects depicted in rock art is an intractable problem, even if they sometimes seem 'obvious' at first glance. A two-dimensional picture is a representational depiction insofar as it reproduces the characteristic shape of its subject, so grammatical analysis of the geometry of the picture and its comparison with the three dimensional geometry of the possible subject indicates if the identification is likely to be correct, and what confidence can be placed in it. The method is developed with, and illustrated by, the 'prehistoric maps', supposed plans of prehistoric villages, which have been identified in the rock art of alpine France and Italy.(38)

*Chiswell, Coreen (UCLA)*

**NETWORK ANALYSIS OF CHIMU ARCHITECTURE.**

Many Chimu (AD 1000-1400) sites from the North Coast of Peru include complex adobe compounds. Network analysis, which concentrates on the study of permeability, is one means of examining the plans of these complexes. Such analysis suggests the compounds were laid out specifically to direct the flow of traffic and to limit access to particular parts of the compound. Hypotheses generated from network analysis of the plans of one Chimu site, Pacatnamu, are tested against preliminary results of excavation.(17)

*Christensen, Karen Marie (Aarhus)*

**PATTERNS OF LAND USE IN NORSE GREENLAND.**

Based on survey work carried out in 1981, 1984, and 1986, a model for upland (over 200 m ASL) land use in the extinct Norse Western Settlement is presented. Seasonal caribou hunting and some sheep and goat herding appear to be the extent of Norse exploitation of the upper elevations. This pattern contrasts with data collected in the larger Eastern Settlement to the south, and with current models for medieval shielding activity in continental Scandinavia. Ecological and demographic factors are proposed to account for these differences.(21)

*Churcher, Charles S. (Toronto)*

**NEOLITHIC FAUNAS FROM DAKHLEH OASIS, WESTERN DESERT OF EGYPT.**

Avian, mammalian and molluscan taxa from pottery and pre-pottery Neolithic levels at scattered sites in Dakhleh Oasis show an Ethiopian savannah facies of wild and domestic animals. Wild taxa include molluscan *Pila ovata*, *Melanoides tuberculata*, *Gyraulus costulatus*, *Corbicula fluminalis*, avian *Struthio camelus* and large Anseriformes or Otididae, and mammalian *Equus grevyi*, *Bos primigenius*, *Syncerus caffer*, *Alcelaphus buselaphus*, *Gazella dorcas* and *Loxodonta africana*. Domestic animals include *Bos taurus*, *Capra aegagrus* and *Equus asinus*. Petroglyphs in the oasis represent these and later domestic taxa, e.g., *Camelus dromedarius* and *Equus caballus*, and, also *Giraffa camelopardalis* and possibly *Oryx dammah* and *Capra ibex*.(14)

*Chun, Chen (McGill)*

**THE SANSHAN SITE: A NEWLY DISCOVERED UPPER PALEOLITHIC SITE ON THE EAST COAST OF CHINA.**

The Sanshan site is located on a small island (2 km<sup>2</sup>) in Taihu Lake, the third largest freshwater lake in China, not far from Shanghai. Over 5,000 stone artifacts and some 20 species of mammalian fossils were recovered from the site. The fossils indicate that during the terminal Pleistocene, the Yantze River delta and Taihu Lake area was a wooded grassland dotted with small lakes and streams, frequented by animals and human groups. Artifacts of the Sanshan assemblage exhibit technological and typological attributes that have not been observed among Upper Paleolithic sites in the loess highland of North China. The assemblage may represent one of the co-existing subsistence patterns in different environmental niches of the terminal Pleistocene in China.(20)

*Claassen, Cheryl (Appalachian State)*

**UNCOVERING TRADE ROUTES FOR SHELLS.**

Seventy-three shell beads and non-artifactual shell samples have been chemically assayed using inductively coupled plasma emission spectrometry. The chemical signature created by nine elements measured in parts per million has facilitated the preliminary identification of sources for trade in Busycon columella sections, during Hopewell times.(40)

*Claassen, Cheryl (Appalachian State)*

**SHELLFISHING SEASONALITY: PROBLEMS OF RECOGNIZING ANNULAE.**

In this workshop presentation, thin sections of two genera of Atlantic bivalves (*Mercenaria*; *Rangia*) and four genera of Pacific bivalves (*Nacoma*; *Protothaca*; *Clinocardium*; *Saxidomus*) will be examined for annulae microscopically. The microscopic view will be projected for group viewing. The audience will see both growth structure and growth variation which makes determination of shell seasonality so challenging.(53)

*Clark, D.(59)*

*Clark, J.E. (see Blake, M.)(45)*

*Clark, Jeffrey T. (North Dakota State)*

**STRANGER CHIEFS AND YOUNGER BROTHERS: PARADIGMS FOR POLYNESIAN COLONIZATION.**

In order to better understand Polynesian settlement, we must go beyond variables such as population size and ecological conditions, and also consider culture itself as a motivating factor. This paper explores the implications of a structural/symbolic approach to Polynesian prehistory. Special emphasis is given to the role of fundamental paradigmatic themes of Polynesian culture in the colonization of Polynesia, and in subsequent sociocultural development. The focus of the study is on the paradigmatic themes of "the stranger chief" and "junior usurpation of power," and how these models for behavior stimulated the settlement of the Polynesian Islands.(55)

*Clark, Lynn, Randall H. McGuire and LouAnn Wurst (SUNY-Binghamton)*  
**DOMINATION, RESISTANCE, AND MEANING IN THE CEMETERY.**

Recent discussions of ideology in archaeology have treated ideology as an instrumentalist phenomenon, where ideology is seen as a means by which an elite group dominates subordinates. Studies of the 19th and 20th century cemeteries in Broom County, New York challenge this perspective. It is suggested that ideology is a much more complex phenomenon. A dominant ideology is evident in the cemeteries; however, this ideology is not uniform or unchallenged. The ideology documented in the cemeteries also expresses competition between different elite groups and the resistance of the working class.(29)

*Cleland, Charles (Michigan State, East Lansing) and Thor Conway (Provincial Archaeologist, Sault Ste. Marie)*

**DATING ALGONKIAN ROCK ART THROUGH ETHNOGRAPHY, GEOMORPHOLOGY AND ARCHAEOLOGY.**

The chronology of Great Lakes area rock art relies on a variety of techniques. The pictographs attributed to the historic and prehistoric Ojibwa can be dated by several methods: (1) the geomorphological position of many sites on recent shorelines; (2) panels dated through native oral history and motifs; (3) artifact associations; (4) relative dating by superimposed pictographs; and (5) cross-dating to portable art objects. Examples of each method and appropriate sites will be illustrated. The rock art tradition that is currently dated by these methods spans the Woodland era from 500 B.C. to 1850 A.D.(35)

*Cleland, Kathryn M. (UCLA), Dwight W. Read (UCLA), and Izumi Shimada (Harvard)*  
**APPLICATIONS OF DIGITIZING TO ANALYSIS OF CERAMICS FROM HUACA DEL PUEBLO BATAN GRANDE, PERU.**

Chronologically validated ceramics from Huaca del Pueblo Batán Grande, Peru, provide data for testing a new method of rim sherds analysis through digitizing. The process generates new variables for multivariate analysis. These would be unavailable if only standard metric and non-metric attributes were analyzed. Work in process suggests that ubiquitous utilitarian rim sherds may be amenable to broader chronological and quality control study that was thought previously. Practical, methodological and theoretical implications will be discussed.(39)

*Clement, C.O. (see Moseley, M.E.)*(6)

*Close, Angela and Fred Wendorf (SMU)*

**HOLOCENE ARCHAEOLOGY IN THE SOUTHERN WESTERN DESERT.** Research in the southern part of the Eastern Sahara has revealed a sequence of six distinct, and distinctive, phases of the neolithic, between 9500 and 5500 B.P. All are associated with evidence of food-production and ceramics. Based on the detailed chronology of this sequence, systematic surveys were made in the area where the shuttle imaging radar revealed a complex of buried channel-like features. The surveys indicate that the features are probably pre-pleistocene, that they did not contain rivers during the holocene and that the area was never more than marginal to prehistoric economics.(14)

*Close, A.E. (see Wendorf, E.)*(20)

*Cobos, Rafael (Universidad Autónoma de Yucatán, Mérida, Yucatán, Mexico)*  
**SHELLING IN: MARINE MOLLUSCA AT CHICHÉN ITZÁ.**

The analysis of marine mollusca recovered from the 1985 excavations at Chichén Itzá is presented along with a review of previous reports of archaeological mollusca recovered at the site. Viewed as a whole, the marine shell inventory reflects widespread trade between the Itzá capital and all three coasts of the peninsula; while most of the shell was imported from the north coast, significant quantities were traded from the east coast, and a few specimens were brought from the west coast. The east coast sample is particularly significant, as it reinforces growing evidence of Itzá ties to the Caribbean.(47)

*Cockrell, Wilburn A. (Manatee)*

**WARM MINERAL SPRINGS: DEEP-WATER EXCAVATION AT AN 11,000 YEAR OLD SITE IN SOUTHWEST FLORIDA.**

Warm Mineral Springs (8So19), a 70 m deep spring-fed limestone sinkhole in Sarasota County, Florida, has been worked by the author intermittently since 1972. The site has three components: 1) terrestrial; 2) 13 m below once-dry ledge deposits; and 3) debris cone on the bottom (30 m high x approximately 75 m wide) extending from 38 m below surface to 70 m below surface. The terrestrial component is producing limited Archaic and Paleo-Indian Stage materials; the 13 m ledge, dry 10-12

thousand years BP, is producing paleo-Indian Stage materials and extinct megafauna; the debris cone has always been covered by the anoxic waters and is currently being excavated.(19)

*Coggins, Clemency C. (Harvard)*

**JOURNEY INTO THE PAST: TEOTIHUACAN IN MAYALAND.**

The evidence for Teotihuacan's impact on the Early Classic Maya will be reviewed in terms of its specialized contexts and of recent excavations at Tikal which suggest an earlier presence there than previously thought. An ideological aspect of Teotihuacano travels southward will be discussed as will a cosmogony shared with Tikal and the southern lowlands. These ancient beliefs, ancestral to both cultures, were illustrated at Teotihuacan and at Tikal in different media, and survived in sixteenth century Maya scripture. A Maya name for these foreigners will be proposed and its implications considered.(11)

*Coggins, C.C.*(2)

*Coinman, Nancy R. and Geoffrey A. Clark (Arizona State)*  
**ASPECTS OF STRUCTURE IN LATE PLEISTOCENE (EPIPALEOLITHIC) OCCUPATION SITES IN WEST-CENTRAL JORDAN.**

A 95% sample of lithic debris from Site 1065, a dated Geometric Kebaran base camp with midden deposits and structures in the Wadi Hasa (West-Central Jordan), is analyzed using density distribution maps and cluster analysis to determine (1) what parts of the surface array have integrity, and (2) whether the surface distribution can be interpreted in terms of activity-specific loci. Structural and compositional characteristics of the surface array are compared with excavated samples. Assessments of methods used to detect aspects of structure in surface data from ancient late pleistocene contexts are provided.(34)

*Collins, James M., George R. Holley and William I. Woods (Southern Illinois-Edwardsville)*  
**NEW DATA ON AN OLD ENIGMA: THE SECOND TERRACE OF MONKS MOUND.**

Archaeological investigations were conducted on the west face of Monks Mound at the Cahokia site, Madison County, Illinois. The project, sponsored by the Illinois Historic Preservation Agency, was prompted by a massive slump which occurred in the second terrace during 1985. Data pertinent to the engineering, construction, age and use of this portion of the mound, as well as documentation of the slump, are presented. This work represents the first excavation into the mound's second terrace and serves to refute earlier interpretations that suggest the second terrace is a late (Moorehead phase) construction.(10)

*Collins, Sara L. (U.S. Army Central Identification Laboratory)*  
**REALLY DEAD BIRDS: HUMAN PREHISTORY AND AVIAN PALAEOLOGY IN THE HAWAIIAN ISLANDS.**

Recent research on avian palaeontology and Hawaiian prehistory provides ample data—from both cultural and palaeontological deposits—for the exploration of issues surrounding human/avian relationships. Among these issues are: Methodological Problems (e.g., distinguishing cultural from palaeontological assemblages; the use of extinct, extirpated or introduced species as temporal markers); (2) Cultural Processes (e.g., the roles of domesticated and endemic species in the Hawaiians' diet and changes in those roles); (3) Environmental Changes (e.g., effects of agricultural activities on avian habitats). Data from archaeological excavations on four of the main Hawaiian Islands are used to illustrate these issues.(25)

*Conkey, M.* (58)

*Conrad, G.W. (see Borstel, C.L.)*(49)

*Conway, Thor (Ontario Ministry of Citizenship and Culture)*  
**SHAMANIC RITUALS AND THE INTERPRETATION OF OJIBWA ROCK ART.**

Ojibwa rock art from the Canadian Boreal forest area is interpreted through the study of shamanic activity. Ethnoarchaeological research among shamans and tribal elders reveals their rock art as the residual product of varied rituals, including vision questing, calendric and solstitial functions, sorcery and bear cult ceremonies. Specific sites are examined in detail through informant identification and historic documentation. Ojibwa art is diverse in origin, with both public and private contexts. The relationship of various shamans, including Wabeno, Jessakid and Grand Medicine practitioners is examined in reference to rock art.(38)

*Conway, T. (see Cleland, C.)*(35)

*Cook, Anita G. (SUNY, Binghamton)*  
**THE ECONOMIC DIMENSIONS OF ANDEAN RITUAL IN THE FORMATION OF EARLY POLITIES.**

The political organization of early statehood in the Ayacucho Valley during the 6th and 7th centuries is inferred from settlement pattern studies. A study focused on the ceramics from sites in Ayacucho



that were occupied during the period of transition to statehood include offerings that can be dated and whose contexts and contents reveal the importance and frequency of such occasions. Ancient Andean offerings have exclusively received attention as the end results of ritual behavior and as such are removed from the more political and economic spheres of daily life that contributed to the establishment of highland polities. A discussion illustrating the economic importance of these offerings as forms of ritual tribute is presented.(17)

*Cook, John P. (BLM, Alaska)*

#### **ETHNOLOGY, HISTORY, AND ARCHEOLOGY AT HEALY LAKE VILLAGE.**

Robert McKennan collected, over several years, considerable ethnographic information from Healy Lake and environs which has not been published. There are also some photographic materials. Unpublished historical information from some early prospectors and missionaries is also available. These data are used in conjunction with archaeological material recovered during the Village site excavations to produce a recent history of the Village and a tentative ethnohistoric "artifact pattern". This is, in turn, compared to collections of the same period from other Alaskan areas.(59)

*Cooke, R.G. (see Ranere, A.J.)(57)*

*Coupland, Gary (British Columbia)*

#### **LOGISTICS AND COERCION: THE EVOLUTION OF NON-EGALITARIAN SOCIAL FORMATIONS ON THE NORTHWEST COAST.**

The role of "collector strategies" in the evolution of non-egalitarianism among hunter-gatherers is investigated. Large-scale storage and logistical mobility do not require hierarchical arrangements. Rather, they permit a lifting of the sanctions that reinforce strict egalitarianism. This paper presents archaeological data from the lower Skeena River area of the Northwest Coast which shows that large-scale storage and semi-permanent village life were in place before ranked society emerged. Hierarchies developed as a result of internal processes, including considerable coercion and violence.(58)

*Craig, Alan K. (Florida Atlantic)*

#### **ANDEAN LAND SNAILS AS PALEO-ENVIRONMENTAL INDICATORS.**

The evolutionarily conservative land snails of the Family Bulimulidae have made remarkable adaptations to maritime desert environments of extreme aridity along the coasts of Peru and Chile. Several genera and species are reported from archaeological contexts where their presence often has been mis-interpreted. Research on population dynamics, dispersal mechanisms, estivation rates, and ranges, provides new insights into paleoenvironmental reconstructions of habitats below 2800 m. Extinct species involved in ceremonialism and long-distance trade are identified and discussed.(6)

*Craig, Douglas B. (Arizona)*

#### **THE HOHOKAM COLONIAL EXPANSION: A TUCSON BASIN PERSPECTIVE.**

The late Pioneer/early Colonial periods witnessed the first widespread appearance of the Hohokam in areas outside the Phoenix Basin "core" region. This so-called "Colonial Expansion" has traditionally been explained in terms of a migration model. An alternative model has also been proposed, one that views diffusion and exchange rather than population movement as the chief mechanisms by which Hohokam traits spread. These models are critically evaluated in light of data obtained from recent excavations at AZ AA:16:49 (ASM), a large ballcourt village in the southern Tucson Basin.(51)

*Creamer, Winifred (School of American Research)*

#### **THE ROLE OF ETHNIC AFFILIATION IN INTERREGIONAL INTERACTION IN NORTHERN HONDURAS.**

Researchers in Honduras have suggested that interregional interaction was promoted or facilitated by the activities of diverse ethnic groups, or by the manipulation of ethnic ties by individuals who mediated transactions between different regions. Recent research in the Sula Valley shows that ethnic affiliation may provide a model for interregional contacts although archaeological verification of the model has been fraught with difficulties. Using data from the Sula Valley during the period from A.D. 600-900, an archaeological example of the role of ethnic affiliation in interregional interaction is developed.(8)

*Cresswell, R.G. (Toronto)*

#### **IRON COMES OF AGE.**

Induction melting of iron and cryogenic trapping of CO<sub>2</sub> gas provides a clean and efficient means of generating samples for radiocarbon dating by accelerator mass spectrometry from only a few grams of material. Basque and Roman (!) nails and fragments from a Frobisher bloom have now been scrutinized, where in the past insufficient material has made analysis by conventional methods either

impossible or unviable. The results of over 20 samples clearly outline the feasibility of this technique for dating iron artifacts.(23)

*Crowell, Aron L. (Smithsonian)*

#### **THE REGIONAL ECONOMY AND SETTLEMENT PATTERN OF NORTHWESTERN KODIAK ISLAND.**

Survey and excavation data from over 200 coastal and riverine sites in the Karluk, Spiridon, Uyak, and Uganik drainages are synthesized. Settlement size, location, spacing, and seasonality are correlated with significant intra-regional resource variations, particularly along the dimension of salmon vs. sea mammal-based subsistence systems. Temporal increase in house and village sizes is discussed (through the Ocean Bay, Kachemak, and Koniag phases). Comparisons are drawn between the study area and other parts of the northern Pacific (Aleutians, NW Coast) where complex hunter-gatherer societies developed.(7)

*Crown, Patricia L. (Southern Methodist) and Ronald L. Bishop (Smithsonian Institution)*

#### **CONVERGENCE IN CERAMIC MANUFACTURING TRADITIONS IN THE LATE PREHISTORIC SOUTHWEST.**

The Salado Polychromes are among the most widely distributed ceramic types in the prehistoric Southwestern United States. Manufactured between A.D. 1300 and 1450, the distribution of the ceramics has long been attributed to exchange from a single region in central Arizona. Instrumental Neutron Activation Analysis of 200 samples of Gila Polychrome from 22 sites spread throughout the Southwest suggests local manufacture of the material, making this the only known type to have been manufactured in an area crosscutting most recognized Southwestern cultural boundaries. Ongoing whole vessel analysis reveals considerable uniformity in technology and styles of design despite the widespread area of manufacture.(50)

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

#### **TOWARD A DEFINITION OF COMPLEXITY: SOME BURGUNDIAN PUZZLES.**

The argument that society becomes increasingly complex underlies widespread acceptance of the dominant (cultural evolutionary) paradigm of the emergence of ranked society. Much recent analysis however, has yielded evidence which is difficult to either describe or explain under the umbrella of a model based on a term which remains largely undefined. Three examples from Burgundy of economic, social, and administrative complexity are examined and their relation to the concept of ranking explored. Particular attention will be paid to the ability of cultural evolutionists to effectively model these relations. An alternative, heterarchical model of social complexity is proposed.(48)

*Custer, Jay F. (Delaware)*

#### **PATTERNS IN PETROGLYPHS AND IN CERAMICS OF THE LOWER SUSQUEHANNA VALLEY, DELAWARE.**

The petroglyphs of the lower Susquehanna Valley, Delaware, have been the focus of archaeological interest for more than 100 years; early studies provided a catalogue of the designs before they were flooded by hydroelectric dams. Recent analysis of the petroglyphs shows that they are located on the border of the Minguannon and Shenks Ferry/Susquehannock archaeological complexes. Design rules can be discerned from analysis of the petroglyphs, and similarities between petroglyphs design-rules and local ceramic design-rules are present. These similarities suggest a late prehistoric age for the petroglyphs, which may have functioned as markers of cultural and ethnic boundaries.(38)

*Czaplicki, Jon S. (ASM, Tucson) and John C. Ravesloot (ASM, Tucson)*

#### **DETERMINING SUBSURFACE SITE BOUNDARIES AT HOHOKAM SITES BY INTENSIVE TRANSECT RECORDING.**

Determining subsurface feature distribution is a problem in excavation planning. ITR was developed as a survey/testing tool to aid in excavation planning, and is based on the co-occurrence of major functional classes of artifacts in surface context. It has been selectively used on the Tucson Aqueudct Project, but only recently could ITR be tested by extensive excavation. The utility, application, and future potential of ITR are discussed in light of the results of these excavations.(34)

*Dalan, Rinita A. (Geo-Recon, Seattle), Julie K. Stein (Washington, Seattle), John M. Musser, Jr. (Geo-Recon, Seattle) and Clyde A. Ringstad (Geo-Recon, Seattle)*

#### **ARCHAEO-GEOPHYSICS AND CORING: A PARTNERSHIP THAT WORKS.**

Geophysical and coring data were obtained at English Camp, a Northwest Coast shell midden, to aid in determining site formation processes. As excavations at the site have revealed a complex history of deposition and post-depositional change, the definition of pre-occupational topography and post-depositional alterations is needed to address questions regarding site formation. Geophysical tech-

niques employed include Seismic Refraction, Electrical Resistivity (Vertical Electrical Soundings and Horizontal Electrical Profiling), and Magnetic Gradiometer surveys. The results of these techniques and their potential for providing relevant information for the interpretation of site formation in coastal situations is discussed.(43)

*Dancey, William S. (Ohio State)*

**THE MURPHY SITE (33-Li-212): A MIDDLE WOODLAND SETTLEMENT IN CENTRAL OHIO.**

Systematic surface collection and excavation of the Murphy site in Licking County, Ohio, have produced a sample of core-and-blade debitage, cut mica fragments, and plain, grit tempered ceramics which, along with radiocarbon dates ranging from 90 B.C. to A.D. 210, suggest a Middle Woodland occupation. The 1.5 ha site contains post mold and pit features which appear to be the remains of a hamlet type settlement. Archaeobotanical samples from the features include cultigens of the Eastern Agricultural Complex. One of the most completely investigated Middle Woodland sites in the Middle Ohio Valley, the Murphy site promises to shed light on a variety of questions concerning Hopewellian settlement pattern, subsistence, and inter-regional cultural interaction.(10)

*D'Andrea, A.C. (Toronto)*

**LIMITATIONS ON THE INTERPRETATION OF ARCHAEOLOGICAL WOOD CHARCOAL.**

The interpretive potential of archaeological wood charcoal is limited with respect to both general palaeoecological studies and attempts to assess human impact on local vegetation. Regardless of whether wood charcoal species composition in an archaeological context is quantified by the number of fragments recovered or the absolute weight per taxon, the results do not reflect local forest species composition at the time of deposition. There are many factors involved in the acquisition of wood and its subsequent deposition and preservation as wood charcoal on archaeological sites. The presence of certain taxa is the only sound criterion for the interpretation of wood charcoal samples. Charcoal materials recovered from Northern Algeria will be discussed as an example of this approach.(43)

*Daniel, Jr., I. Randolph (UNC-Chapel Hill)*

**THE ORGANIZATION OF A SUWANNEE TECHNOLOGY: THE VIEW FROM HARNEY FLATS.**

This paper presents the results of a lithic analysis performed on a large (1.35 ha) stratified early man (Suwannee) site located near Tampa, Florida. Excavations conducted in 1981-82 covered 967 sq m and focused on block excavations in three sub-areas of the site. Various tool types from a large Suwannee assemblage (over 1000 tools) are discussed from a technological organization perspective—understanding why certain tool designs were created and how these designs were implemented within the settlement system. In addition a chert source identification study was performed on the stone tool assemblage and the implications of these results are also presented.(46)

*Darlington, A.D. and Julie Francis (Office of the Wyoming State Archaeologist)*

**CACHE AND CARRY: LITHIC PROCUREMENT STRATEGIES AND STONE CACHES IN NORTHEASTERN WYOMING.**

Many studies of lithic procurement strategies have focused on primary source locations of chipped stone raw materials, while the role of storage of stone for future use has rarely been explored. Over the last several years, the occurrence of several lithic caches in northeastern Wyoming has been documented. In this paper, data, including environmental context, source analysis, content, and assemblage variability, from northeastern Wyoming caches are presented. The relationships between caching behavior and previously proposed models of lithic procurement and utilization are also explored.(31)

*Davis, Richard S. (Bryn Mawr)*

**CENTRAL ASIAN HUNTER-GATHERERS AT THE LAST GLACIAL MAXIMUM.**

There is little evidence for human occupation of the Afghan-Tadzhik depression, the Kyzyl Kum, the Kara Kum or the Caspian shore of Central Asia during the last half of the Würm. The leading hypothesis for this hiatus in the archaeological record is that the increasing cold and arid conditions of the glacial maximum rendered the Central Asian middle latitude steppe environment beyond the adaptive limits of the local Upper Paleolithic populations. Available environmental, subsistence-technological, chronological, and settlement history data are not sufficient to reject the climatic hypothesis at present.(20)

*Deacon, Janette (Stellenbosch)*

**ETHNOHISTORY AND SOUTHERN SAN ROCK ENGRAVINGS.**

Recent research in southern Africa has highlighted the importance of ethnographic analogies in the interpretation of rock art. Some unanswered questions generated by this approach focus on whether changes have occurred both through time and space in the style, content and metaphors used. Rock

engravings in the northern Cape Province provide a unique testing ground because, first, there is a greater potential for relative dating of engravings than is the case with paintings. Second, there are ethnographic records for the northern Cape that relate to the belief system of the /Xam San of the late 19th century that have relevance for the interpretation of the themes in the engravings. Third, these records suggest that there were at least two and possibly more dialect groups in the region, which allows for the investigation of inter-group variability in rock art content, style and related stone artifact assemblages. Some characteristics are shown to be site-specific, others are group specific, and others are common to all sites in the region.(38)

*Deal, Michael (Memorial, Newfoundland)*

**HOUSEHOLD POTTERY STORAGE AND SITE STRUCTURE: A VIEW FROM THE MAYA HIGHLANDS.**

Separate and distinct storage strategies are associated with pottery production, consumption, and disposal within the Maya household. This is true of general domestic and ritual vessel use, as well as pottery manufacturing activities and the placement of broken vessels for future reuse (elsewhere termed provisional discard). In this context, storage behavior is viewed as having an influential role in the "evolution" of pottery assemblages within ongoing households. Further, remnants of certain vessel storage configurations are likely to survive in archaeological situations and may be confused with household activity areas.(27)

*Dean, C. Gordon (NMSU)*

**NORTHERN HONDURAN SUBSISTENCE HOUSEHOLD KITCHENS AND THEIR CONTENTS.**

A complete inventory of the objects observed in 132 kitchens indicates the range of culinary artifacts currently used by subsistence farming women in two areas of Northern Honduras. The limited kitchen tool kits and the adobe cooking stoves are compared to 1) the size and form of the kitchen work and movement areas, 2) the house structure and, 3) the populations that they support. "Incidental" and "recycled" objects contribute significantly to the inventory as do a number of specialized objects.(24)

*DeAtley, Suzanne P. (Archaeological Research Laboratory, Las Cruces)*

**CERAMIC TECHNOLOGY REVEALED THROUGH MICROSCOPY.**

Petrographic sections of ceramics from American Southwest and other locales will be examined to illustrate manufacturing techniques, material processing and firing conditions employed in the production of the ceramics.(53)

*Deetz, James (UC Berkeley)*

**AFRO-AMERICAN CERAMIC PRODUCTION AND CONSUMPTION IN THE VIRGINIA TIDEWATER.**

Analysis of pipestem fragments from a series of sites at Flowerdew Hundred, Virginia, using Harrington's histograms, shows three distinct settlement modes between the early 17th and early 19th centuries. The earliest reflects the depression of the tobacco economy; the second, the rise of an incipient elite based on slavery in the late 17th century, and the third represents settlers who had a stronger commitment to the land prior to slavery. Slave-manufactured pottery appears only on sites of the latest group, although there was a black presence at Flowerdew from 1619. This seeming contradiction may be a function of architectural changes reflecting a great break in servant-planter relations, and might also explain differences in slave pottery from Virginia and South Carolina.(29)

*Deetz, J.(29)*

*Dehn, H. (see Drennan, R.D.)(11)*

*Delacorte, Michael G. (U.C. Davis)*

**THE ROLE OF MARRIAGE NETWORKS IN STRUCTURING GREAT BASIN SETTLEMENT PATTERNS.**

Differences between regional settlement patterns across the Great Basin are often taken to reflect variations in local environment, particularly the availability of subsistence resources. Similar environmental settings can, however, support divergent settlement patterns. This suggests a complex relationship between environment, subsistence, and settlement patterns. Comparison of prehistoric settlement patterns between Deep Springs and Owens Valley, California, which share many similarities in environment, indicates that the size of local population and the resulting marriage network plays an important role in linking settlement strategies to local environment.(51)

*de Laguna, F (7)*

*Deller, D. Brian (McGill)*

**GREAT LAKES PALEO-INDIAN: INTERPRETATION OF CHERT UTILIZATION PATTERNS IN THE PARKHILL COMPLEX.**

Recognition and analyses of chert utilization patterns have played a significant role in the discovery and interpretation of Ontario Paleo-Indian sites. Data from several sites and findspots in southwestern

Ontario are used to infer band territories and seasonal population movements for the Parkhill complex. These patterns of chert usage differ substantially from that of preceding and later complexes such as Gainey and Crawford. Implements on Parkhill complex sites manufactured elsewhere from Bayport chert suggest interaction with a closely related population in Michigan.(46)

*de Montmollin, Olivier (Cambridge)*

#### SHIFTING SPATIAL SCALES IN STUDIES OF MAYA SETTLEMENT AND POLITICS.

Interesting methodological and theoretical issues arise when selecting scales of study for understanding Maya settlement and political structure. In particular, selecting a small scale of study (house groups - households) and extrapolating to comment on larger scale problems (involving sites and regions - communities and polities) falls into a reductionist trap. As illustration, implications of shifting scale when studying the locus and determinants of residential decision-making are examined, with primary reference to Classic Maya settlement and politics from the Rosario Valley, Chiapas, Mexico.(45)

*Dennell, Robin (Sheffield)*

#### 18,000 B.P. IN PAKISTAN AND CENTRAL ASIA.

This paper will cover the sparse archaeological and palaeoenvironmental record for the glacial maximum at 18,000 B.P. in Pakistan, northern India, Afghanistan and Central Asia. Reasons for our almost total ignorance of these fields in this region will be discussed, and suggestions made as to the range of data that need to be collected, and the questions that are worth asking. Given the state of the current data base for the glacial maximum in this region, discussion will be extended to cover the latter part of the last glaciation from 30,000 B.P. onwards.(20)

*Desson, D. (see Aigner, J.S.)(7)*

*Dibble, Harold L. (Pennsylvania)*

#### THE LA QUINA COMPUTER DATA SYSTEM.

New excavations at the Middle Paleolithic site of La Quina (Charente, France) began in 1985 as a cooperative project involving the Universities of Bordeaux, Arizona and Pennsylvania. During the past season (1986) a fully computerized data system was developed and implemented. This distributed system is described with a focus on the use of an electronic distance meter/theodolite for artefact point proveniencing and mapping. This system should be of interest for all archaeological field applications.(39)

*Dibble, H.L. (see Chase, P.G.)(16)*

*Dodd, Walter A. (Utah)*

#### FACTORS CONDITIONING THE PLACEMENT OF FIRE-RELATED FACILITIES AND REFUSE.

Ethnographic and archaeological research demonstrates that sedentary societies position fires and dispose of their byproducts in spatially diverse ways. Recent site structural studies make it possible to begin understanding why such variable arrangements occur. Data gathered among the Guarijia of northwestern Mexico, who employ at least eight different kinds of firemaking facilities, suggest that several spatial determinants are involved. These include climatic conditions, type of architecture, activity structure, and other considerations. Insights derived from observation of the Guarijia are used to forge an explanation for some cross-cultural differences and similarities.(27)

*Donahue, D.J. (see Long, A.)(23)*

*Donahue, J.(6)*

*Donahue, Randolph E. (SUNY Stony Brook)*

#### MICROWEAR ANALYSIS IN THE STUDY OF CURATED AND EXPEDIENT TECHNOLOGIES IN THE ITALIAN UPPER PALEOLITHIC.

Operationalizing complex theoretical concepts such as curation and expediency as they pertain to Paleolithic stone tool assemblages is difficult. One problem is that archaeologists often use data such as formal characteristics of stone tools whose relationship to these concepts is ambiguous at best. A method is proposed whereby indications of such human behavior with respect to stone tools are deduced. These deduced properties are recognizable through microwear analysis, especially in association with technomorphological study. Comparison of assemblages can then provide some relative measure of curatorial behavior as exemplified by analysis of Epigravettian assemblages from Paglicci Cave and Petriolo III South, Italy.(9)

*Doolittle, William E. (Texas, Austin)*

#### SURVEY EVIDENCE OF DOORYARD GARDENS IN THE SOUTHWEST.

The prehistoric use of dooryard gardens in arid lands and especially in the Southwest has not been given much consideration even though such gardens are quite common today. Ethnographic data from eastern Sonora, Mexico indicates that dooryard gardens (1) tend to be located downhill of houses, and (2) are marked at their lower ends by low rock walls or terraces. Maps of pre-Hispanic sites in the Valley of Sonora are reviewed for this type of evidence. Suggestions for future research are offered.(42)

*Dorn, Ronald (Texas Tech) and David S. Whitley (UCLA)*

#### CATION RATIO DATING AND ROCK ART CHRONOLOGY IN THE WESTERN GREAT BASIN.

Cation ratio dating of rock varnish has yielded thirty-five absolute dates on petroglyphs from the western Great Basin. Ages range from approximately 13,000 to 200 years B.P. SEM analyses of the micromorphological structure of the dated varnish provides independent support for the Late Pleistocene age assignments of five petroglyphs. Previous stylistic chronologies are not supported by our latest suite of sixteen dates from the Coso Range. The cation dates suggest a very lengthy tradition of ritual activity that extends back into Palaeo-Indian times.(35)

*Douglass, Amy A. (ASU)*

#### EXPLORING PREHISTORIC SOUTHWESTERN CERAMIC EXCHANGE: LITTLE COLORADO WHITEWARE DISTRIBUTIONS AND EDA.

Much recent archaeological research in the Southwest has focused on ceramic exchange and its role in the maintenance of regional political systems during later periods of prehistoric cultural development. However, less research has been directed toward modelling the earlier organization of Southwestern exchange systems. This paper will examine the geographic distributions of Little Colorado Whiteware, one of the earlier known Southwestern tradewares. A literature search of previously recorded sites provides the database. A distance decay study is presented using Exploratory Data Analysis (EDA). Insights into the mode of production and exchange, as well as the locus of production, are offered.(51)

*Douthit, M.L. (see Prentiss, W.C.)(56)*

*Dreiss, Meredith (Texas, San Antonio)*

#### AN OBSIDIAN DISTRIBUTION MODEL FOR THE BELIZE PERIPHERY.

Trace element studies of obsidian from Belize sites suggest several interesting patterns related to diachronic distribution patterns and use of coastal networks for transport of trade items. Obsidian from the El Chayal source, previously believed to be distributed by inland routes during the Classic Period, was in fact distributed as early as the Late Preclassic by coastal networks along with obsidians from the Ixtepeque source. A regionalized obsidian distribution pattern for the relatively autonomous Belize periphery differs somewhat from the trade models previously established by Nelson and Hammond for the Maya lowlands.(47)

*Drennan, Robert D., Heinz Dehn, and Philip T. Fitzgibbons (Pittsburgh)*

#### THE TEHUACAN VALLEY AND THE TEOTIHUACAN OBSIDIAN INDUSTRY.

Commerce, especially involving exportation of obsidian, is often assigned a major position in the economy of classic period Teotihuacan, with Teotihuacan sometimes seen as monopolizing obsidian trade throughout Mesoamerica. Proponents of such models cite evidence that obsidian from sources near Teotihuacan appeared in distant regions. Patterns of obsidian procurement in the Tehuacan Valley during the Formative and Classic, however, are inconsistent with such a view. They suggest that, to the extent that Teotihuacan's obsidian industry produced for export, the major objective was not profit in any meaningful sense, but the acquisition of luxury goods from great distances.(11)

*Driscoll, Stephen T. (Glasgow, Scotland)*

#### THE EMERGENCE OF A PICTISH KINGDOM: MATERIAL CULTURE AND POWER.

In the early Medieval period (c. 600-1000 AD), the kingdom of Fortriu emerged as preeminent among the kingdoms of Southern Pictland and came to form the core of the later Medieval Scottish kingdom. Our best understanding of the establishment of this authority derives from three related bodies of material culture, which may be analyzed as distinct fields of social discourse. These are 1) royal sites which may be studied architecturally and in terms of their relationship to the prehistoric landscape, 2) monumental sculptures, including the symbol stones and the early Christian crosses, and 3) the economics of agricultural production and the circulation of prestige goods.(29)

*Dumond, Don E. (Oregon)*

**THE NORTHERN ALASKA PENINSULA IN SOUTHWESTERN ALASKAN PREHISTORY.**

Astride the ecological boundary between the arctic Bering Sea and the maritime North Pacific, the northern Alaska Peninsula was occupied over three of the last four millennia by two archaeologically distinctive groups, one of the Bering Sea drainage, the other of the Pacific coast, each of which evolved but continued to maintain its distinction from the other. At about AD 1000, these hitherto distinguishable cultures merged into a single complex in an occurrence that archaeologists have interpreted in opposing ways. A resolution is sought through archaeological, biological, and linguistic data.(7)

*Dunham, Peter S. (SUNY, Albany)*

**GRAVITY ANALYSIS AND SETTLEMENT BOUNDARIES: INTERCENTER INTERACTION IN SOUTHERN BELIZE.**

A gravity model from economic geography is adapted to archaeological settlement. Assuming flat terrain, it projects intercenter boundaries based on site sizes and intersite distance. This model is applied to Nimli Pun and Xnaheb, Belize, neighboring cities of the Lowland Maya from the Late Classic (A.D. 700-900). Field mapping of those cities confirms the great potential of such simulations in predicting settlement dropoffs, clarifying intercenter interaction, and highlighting nongravitational influences on settlement patterns. The intersite boundary was accurately located, however, it was strongly affected by topographic variation, and the two cities proved to be poorly integrated, suggesting relative underdevelopment.(45)

*Dunnell, Robert C. (Washington, Seattle)*

**MEASUREMENT AND ARCHAEOLOGICAL USE OF SEDIMENT pH.**

Sediment pH is an easily measured property of demonstrated value to archaeological prospection, stratigraphic interpretation, and formation processes. Even so, pH is not routinely used or reported, at least in part, because its utility seems to vary widely from case to case. Research reported shows how details of sample preparation and measurement may introduce extraneous variation. Examples of the use of pH data are drawn from research in Kentucky, Missouri, and Washington. pH determines many kinds of chemical reactions and reaction rates. Understanding the contemporary content of the archaeological record requires the documentation of archaeological pH.(43)

*Durrenburger, E. Paul (Iowa)*

**ECONOMY AND LAW IN COMMONWEALTH ICELAND.**

During the Commonwealth from its settlement in the 9th century until its incorporation into the Norwegian State system in 1262, Icelandic society was stratified but had no state (Durrenburger 1985). Such societies are unattested in the ethnographic record (Fried 1967). A quantitative analysis of economic and legal transactions is developed as one component of an archaeological-historical systems analysis of medieval North Atlantic societies outlined by McGovern et al. (1985). This is the first quantitative study of the sagas and will help integrate social-historical with archaeological and ecological analyses.(21)

*Dyson, Stephen (Wesleyan)*

**THE RISE OF COMPLEX SOCIETIES IN ITALY: HISTORICAL VERSUS NON-HISTORICAL PERSPECTIVES.**

In Italy during the first millennium B.C. two very complex cultures, Etruria and Rome, evolved. Both became literate. While written Etruscan records have only limited value, those of Rome allow an independent historical reconstruction. With both societies, an abundant archaeological record allows another independent reconstruction. Focusing on one question, the evolution of Roman settlement, this paper will consider the way that abundant but flawed literary records can shape the collection and use of archaeological material, prevent its independent use and distort the reconstruction of social and economic processes active in a complex society's rise and fall. Concluding arguments will be made about the need to use archaeology as a primary source even in literate societies.(48)

*Early, Ann M. (Arkansas Archaeological Survey)*

**PROFITEERS, PAYMASTERS AND PUBLIC ARCHAEOLOGY: ANTIQUITIES TRAFFICKING IN ARKANSAS.**

The destruction of archaeological sites for pleasure and profit in Arkansas is a century old phenomenon characteristic of site destruction elsewhere in the southeastern United States. Rich sites, most on private land, fuel the digging fever and contribute to an interstate antiquities market. The Arkansas Archaeological Survey attempts to deal with this multifaceted problem through strategies directed at landowners, collectors, commercial diggers, dealers, and financiers whose activities are all interre-

lated. Some strategies, based on long-term, personal contact with landowners, citizens and amateur archaeologists seem most effective, but statewide or regional programs are needed to deal with specific problems.(2)

*Ebert, James I., Eileen L. Camilli, and LuAnn Wandsnider (Ebert and Associates)*

**RECENT EROSION OF SITES ON THE MIDDLE MISSOURI RIVER.**

Situated on terraces along the middle Missouri River, numerous large Plains Woodland, Middle Missouri, and Coalescent period sites exist. These sites have been and continue to be impacted by the controlled Missouri River. Using planimetric controlled maps derived from sequential aerial photography dating from 1937 to the present, the nature and rates of recent and historic erosion of these sites is documented. Implications for the continued erosion of these sites are explored.(43)

*Eddy, Frank W. (Colorado, Boulder)*

**SOME THOUGHTS ON EXCHANGE RELATIONSHIPS DURING THE GLAZE PERIOD OF THE GALISTEO BASIN, NORTHERN NEW MEXICO.**

Some patterns of economic exchange are examined within the Galisteo Basin of northern New Mexico during the Glaze Period (AD 1300-1700). Attention is given to pottery manufacture, turquoise, and obsidian. These widely distributed items are considered from the standpoints of sourcing, routes and movement, patterns of consumption, and motivations for trade. Trade during Pueblo IV times is explained by a flow model which interrelates intensive food production, demography, craft specialization, political leadership, and the rise of social complexity.(40)

*Ehrenreich, Robert M. (Smithsonian)*

**THE INTRODUCTION AND DEVELOPMENT OF IRON TECHNOLOGY IN IRON AGE SOUTHERN BRITAIN.**

The introduction and development of iron technology in southern Britain did not appear to have had as profound an impact on British society as has been believed. Iron technology may have been introduced through Cornwall into the landholding prestige system of southern Britain from northern France. Initially, iron appears to have been confined to agricultural implements rather than personal ornamentation or weaponry. The evidence for both the increase in the availability of iron during the Iron Age, and the development of the Iron Age iron production centers in Cornwall and Northamptonshire is examined.(16)

*Eidt, Robert (Wisconsin-Milwaukee)*

**A NEW METHOD FOR IDENTIFYING ANTHROSOLS WITH SPECIAL REFERENCE TO GARDEN SOILS.**

By means of a simple field soil test household garden areas can be rapidly identified and mapped. Mapping is performed either along selected radials or by means of grid squares, following which soil samples are selected for laboratory analysis. Soil phosphate fractionation and other chemical and physical soil traits help identify relative gardening intensity, type, and age. A field example from an archaeological site in Colombia, South America illustrates the procedures outlined above.(42)

*Elliott, Michael L. (Jemez Mountains Research Center)*

**SMALL SITE ("FIELD HOUSE") VARIABILITY ON THE SOUTHERN JEMEZ PLATEAU, NEW MEXICO.**

Very high densities of small sites generally thought to have been associated with prehistoric and protohistoric agricultural practices have been observed on the southern Jemez Plateau in north central New Mexico. Locational and morphological variability of these sites suggests functional specialization and the possibility that all such sites were not related to agriculture. Ethnographic, ethnohistoric, historic, and archaeological data are examined, and a preliminary explanatory model is presented.(26)

*Ellis, Chris J. (Waterloo)*

**THE EXPLANATION OF EASTERN PALEO-INDIAN LITHIC PROCUREMENT PATTERNS.**

As widespread as the Paleo-Indian preference for high-grade cryptocrystalline materials is the tendency for these groups to have focused on certain sources of these materials to the exclusion of others. As a result, lithic assemblages almost totally made on material from a single bedrock formation can be generated at sites up to 300 km or more from the source. In this paper, proposed explanations for this lithic preference are tested ranging from the flakability and portability potential of the material and its relationship to settlement mobility, to the role of lithic materials as "social descriptors" in inter- and intra-group interaction.(46)

*Elster, Ernestine S. (UCLA)*

**STUDYING CHANGE AT SITAGROI.**

Sitagroi excavation in northeast Greece (in an area of contact for the Aegean and the Balkans) yields evidence from middle neolithic to early bronze age. Calibrated radio-carbon dates range from 55/5200-

27/2200 BC and frame five chronological periods identified by specific archaeological materials and some environmental variation. This paper presents results of analyses of multiple classes of data and the problems encountered in attempting to isolate the factors relating to processes of change.(16)

*Elstien, Elizabeth R. (Arizona State)*

**HEAT TREATMENT ON THE NORTHERN HOHOKAM PERIPHERY.**

Analyses concerning heat treatment practices among the Hohokam are either reserved to various cryptocrystalline materials or, worse yet, ignored. Experiments were recently conducted with an intermediate siliceous material (dacite) to determine its characteristics after being subjected to heat. The experiment shows that heat treatment of dacite, as well as jasper, chalcedony and chert, is present at several sites near the New River/Agua Fria River of Arizona. This paper explores the reasons behind the heat treatment of dacite and stresses the need to study heat treatment in future analyses in order to get a more accurate picture of the Hohokam.(56)

*Ericson, Jonathon E. (UCI), Chester King (Topanga, CA), and Clay Singer (Santa Monica, CA)*  
**EXCHANGE AND EPIDEMICS AMONG CALIFORNIA ABORIGINAL POPULATIONS.**

Although California was not isolated from interregional exchange with the American Southwest and other areas, it appears to have been isolated from the earliest episodes of major epidemics until 1783. Thereafter, epidemics appear as a series of diseases: syphilis in 1791, tuberculosis in 1795, measles in 1806, smallpox in 1832 and malaria in 1833. Analysis of archaeological data and mission registers provides records on exchange, social networks, rates/modes of death and demographic changes.(40)

*Falconer, Seven E. (Arizona)*

**RURAL VISIBILITY IN "URBANIZED" SOCIETIES: A STUDY OF GROWTH THROUGH RURALIZATION.**

Early urbanization, exemplified prototypically in southern Mesopotamia, involved population growth and nucleation. However, archaeologically inconspicuous village communities are neglected, and thereby rendered virtually "invisible," when urbanization is assumed to be normal in complex societies. Settlement patterns in Palestine/Transjordan show that the appearance of Bronze Age towns was paralleled by a more significant proliferation of villages. A case study from the Jordan Valley demonstrates that villages performed functions often assumed to be urban: for example, providing access to specialized goods and services. It is argued that secondary developments of complex society may involve growth through "ruralization," rather than "urbanization."(24)

*Farquhar, R.M. (Toronto), J.A. Walthall (Illinois Dept. of Transportation) and S.H. Stow (Oak Ridge)*

**LEAD ISOTOPE EVIDENCE FOR MINERAL DEPOSIT SOURCES OF GALENA FROM SOME MIDDLE WOODLAND AND MISSISSIPPIAN ARCHAEOLOGICAL SITES IN THE SOUTHEASTERN U.S.**

We have undertaken a series of lead isotope ratio measurements on a representative suite of galenas found in middle Woodland and Mississippian grave sites in Alabama and Tennessee to test the applicability of this technique for determining the provenance of the samples. Comparison of the data for the grave site samples with that for galenas from potential mineral source areas in the Upper Mississippi valley, Missouri, and Tennessee suggest that the sources of most of the archaeological galenas lie in the southeast/central Missouri Pb-Zn mineral district. Ten to twenty percent appear to originate in the Upper Mississippi Valley region.(10)

*Farrand, W. (see Mandel, R.)(3)*

*Fecteau, Rodolphe David (Royal Ontario Museum)*

**LATE WOODLAND CULTIVATED PLANT RECORD IN SOUTHERN ONTARIO.**

Five cultivated plants (corn, bean, squash, sunflower and tobacco) are known from ethnographic and archaeological sources to have been grown prehistorically in southern Ontario. The time period during which cultigens were introduced into and spread throughout southern Ontario extends from A.D. 600 to A.D. 1650. On the basis of available evidence the two earliest sites date to around A.D. 600 and have only corn. They are the Princess Point site in the city of Hamilton at the western end of Lake Ontario and the Dawson Creek site near Rice Lake in south central Ontario. Tobacco appears for the first time in the 8th century on a Princess Point site in the Grand River area. Beans, squash and sunflower are all introduced by Young Tradition people in the southwest during the 11th century. The diffusion of cultivated plants appears to be from the south, to the east and later north.(33)

*Feinman, Gary M. (Wisconsin, Madison)*

**FROM FRONTIER TO SEMI-PERIPHERY: PREHISPANIC SETTLEMENT PATTERNS IN THE EJUTLA REGION, OAXACA, MEXICO.**

Preliminary results from the settlement pattern survey of the Ejutla Valley, Oaxaca, Mexico indicate that this marginal area was inhabited later and somewhat more sparsely than the Valley of Oaxaca proper. Coincident with Monte Alban expansion outside of the Valley core, major shifts in the distributions of regional population and civic/ceremonial architecture are noted in Ejutla as the area was transformed from a frontier to a semi-periphery. A second significant restructuring occurred in the Ejutla region following the fall of Monte Alban when there is evidence of decentralization and increased military activities along the region's southern edge.(5)

*Feinman, G.M. (see Nicholas, L.M.)(5)*

*Ferring, C.R. (see Marks, A.E.)(4)*

*Fiedel, Stuart J. (MALFA)*

**ALGONQUIAN ORIGINS: A PROBLEM IN LINGUISTIC-ARCHAEOLOGICAL CORRELATION.**

Most archaeologists currently assume continuous, indigenous development of North-eastern cultures. This model is incompatible with linguists' model of migration of Proto-Algonquians from a homeland near Lake Ontario, ca. 3000-2000 B.P. Attempted identifications of Paleo-Indian or Archaic assemblages as Proto-Algonquian are seriously flawed. Significant discontinuities in the archaeological record of the Early and Middle Woodland periods offer a better context for hypothesized Algonquian expansion.(22)

*Filios, Elena L. (Massachusetts, Amherst)*

**THRESHOLDS TO GROUP FISSIONING AMONG HUNTER-GATHERERS.**

Group composition among hunter-gatherers generally has been seen as resulting from demographic or ecological variables. What these models have failed to consider is the contribution that social processes make to group composition. One of the factors that determines group composition is the facility with which a group can fission. Social processes that actively promote or retard fission do so by decreasing the likelihood of group autonomy or by enhancing group cohesion, thereby contributing to the development of social inequalities. The utility of this approach is investigated by examining archaeological materials from the Early Woodland period in southern New England.(58)

*Finlayson, William D. and David G. Smith (Museum of Indian Archaeology)*

**IROQUOIAN CULTURE HISTORY, SETTLEMENT AND DEMOGRAPHY IN THE CRAWFORD LAKE REGION OF SOUTHERN ONTARIO.**

Archaeological study of the Iroquoian occupation of the Oakville and Bronte Creeks over the past two decades has resulted in the discovery and investigation of sixty (60) Iroquoian sites. This paper will examine the Iroquoian culture history of the region. It will include a consideration of the dating of three sites near Crawford Lake for which varve dates of 1365-1390 A.D., 1434-1458 A.D. and 1605-1630 A.D. are available. It will also explore changes in settlement and demographic patterns and will present possible explanations for these.(36)

*Fish, P. (see Fish, S.K.)(24)*

*Fish, Suzanne K., Paul Fish and John Madsen (Arizona, Tucson)*

**PERCEPTION AND SCALE IN THE EVALUATION OF DISPERSED PHENOMENA.**

Perception and scale proved to be critical factors in recognizing constituent units and overall configuration of multi-site communities in dispersed Hohokam settlement patterns of southern Arizona. Settlement systems deriving major subsistence from valley slopes contrast with expectations based on better known riverine irrigation networks. Large scale full coverage survey was necessary to effectively define land-extensive production complexes and to detect community boundaries within non-compact settlement distributions. Results have implications for recovering and evaluating spatially dispersed phenomena in general.(24)

*Fitzgibbons, P.T. (see Drennan, R.D.)(11)*

*Fitzgibbons, P.T. (see Vento, E.J.)(43)*

*Ford, Pamela J. (Washington)*

**MEASURING CHANGE IN SHELLFISH RESOURCES.**

Abundant shellfish remains in coastal middens provide an unparalleled source of data for measuring the impact of human subsistence strategies upon prey populations. Such research is based on the assumption that trends in shell size are directly related to collection strategies. A shell midden on

San Juan Island, WA (research sponsored by U. of WA and hosted by National Park Service) provides large samples of clam shells from separate archaeological deposits. The shells from each deposit vary in mean size, and size-frequency distributions vary in shape (modality). Because different factors (the prey population, the environment, the method of collection and transport) may produce the same size-frequency distribution, the shell measurements do not provide the direct archaeological information expected. If these factors can be distinguished, the size of shells from archaeological deposits can provide information about subsistence strategies.(25)

*Fox, William A. (Ontario Ministry of Citizenship and Culture, Archaeology Unit)*

#### LOOTING AND LEGISLATION IN ONTARIO.

Clandestine excavation of archaeological sites for the purpose of curio collecting has occurred in Ontario since at least the early 19th century. The first recorded digging involved Middle Woodland burial mounds in the Hamilton vicinity; numerous Huron ossuaries were also looted in Simcoe County. It was not until 1953 that Ontario passed the Archaeological Sites Protection Act, but little real protection was afforded until the Ontario Heritage Act came into effect in 1974. The first prosecution for archaeological site looting occurred in 1985 and was upheld in an appeal to the Provincial Court. A concluding review of the present state of archaeological site looting and artifact sale is presented.(2)

*Francis, Julie E. (Office of the Wyoming State Archaeologist)*

#### WASTE NOT - WANT NOT? ORGANIZATIONAL ASPECTS OF LITHIC TECHNOLOGICAL SYSTEMS IN THE BIGHORN MOUNTAINS OF WYOMING.

The terms 'curated' versus 'expedient' have been widely used in discussions of lithic data, and their use has provoked considerable debate in the archaeological literature. Curation and expediency, in and of themselves, have no explanatory power. They are terms used to characterize certain types of behaviors observable in the archaeological record. The potential utility of these terms is evident when the underlying factors contributing to these behaviors are examined. Data from the Bighorn Mountains are used to demonstrate how availability and accessibility of raw materials relate to differential treatment of the material in the technological system.(9)

*Francis, J.E. (see Darlington, A.D.)(31)*

*Freer, Stan W. (Manitoba)*

#### TEOTIHUACAN AND WESTERN YUCATAN EXCHANGE.

Western Yucatan has a major interchange with the Mexican highlands beginning in the early Middle Classic and continues into the Late Classic. Recent research on Teotihuacan's culture indicates it had the greatest exchange with this area. The exchange is reflected in both architecture and art. Influence first appears in the northwestern area of the Yucatan peninsula at such sites as Ake, Izamal, Dzibilchaltun and Acanceh. Evidence is presented from several sites including Uxmal, Kabah and Oxkintok. A chronological realignment of architectural traits of Puuc sites supports such contact from Teotihuacan.(11)

*Frisson, G.(20)*

*Furgerson, K. (see Pagoulatos, P.)(31)*

*Gamble, C. (see Bailey, G.N.)(20)*

*Gamble, Clive (Southampton) and João Zilhão (Lisbon)*

#### THE PORTUGUESE SOLUTREAN—A NEW APPRAISAL.

Although no direct chronometric evidence is yet available, the time period around 18,000 B.P. in Portugal, as elsewhere in Western Europe, witnesses the development of Solutrean technologies. Evidence related to the environment, the settlement pattern, the palaeoeconomy, the industries and the art of this period is reviewed in this paper, focusing on one particular region, Estremadura; comparisons between the patterns obtained and those established for the Early Upper Palaeolithic and the Magdalenian, as well as with contemporaneous adaptations in the other Palaeolithic regions of Iberia, are drawn.(20)

*Garber, J.E. (see Guderjan, T.H.)(47)*

*Gargett, R. (see Hayden, B.)(44)*

*Geselowitz, Michael N. (Harvard)*

#### THE DEVELOPMENT OF IRONWORKING TECHNOLOGY AND THE RISE OF SOCIAL COMPLEXITY IN IRON AGE CENTRAL EUROPE.

The central European Iron Age was marked by many changes in society. It was a time of great development in the technical sphere: The transition from the use of bronze to the use of iron as the

primary material for producing tools and weapons began in the Late Bronze Age and was basically complete by the beginning of the Late Iron Age. Simultaneously, other aspects of central European society were achieving levels of social complexity previously unrealized in temperate Europe, including the development of that region's first towns. This paper examines the correlations and causal connections between the technological development of ironworking and these other social changes.(48)

*Geselowitz, M. (see Habicht-Mauche, J.)(32)*

*Gibson, D. Blair (UCLA)*

#### AGRO-PASTORALISM AND REGIONAL SOCIAL ORGANIZATION IN LATE IRON AGE WESTERN IRELAND: PROBLEMS OF IDENTIFICATION AND INTERPRETATION.

Available ethnohistorical and archaeological evidence suggests that the social landscape of Late Iron Age Ireland was characterized by multi-tiered chiefdoms and spatially segregated multi-family household units. Analysis of the settlement record of the Burren region of County Clare supports and elaborates upon this characterization. The role of a cattle-dominated economy is explored as a causal and/or limiting factor with respect to household constitution, polity structure, and political expansion and change.(48)

*Gibson, Eric C. (Trinity)*

#### THE ORIGIN OF MAYA CEREMONIAL LITHIC ARTIFACTS.

The "eccentrics" of the southern Maya lowlands are problematic. Previously considered to be the result of diffusion from Teotihuacan in the Early Classic, evidence from northern Belize conclusively shows that ceremonial lithics developed locally in the Late Preclassic. Apparently, full-time intensive lithic craft specialization emerged as a response to a change in agricultural technology. Later, as a result of improved skills and technological innovations developed by these specialists, an elaborate system of votive lithic artifacts became an integral part of regional ceremonialism. Such skill in lithic technology was never surpassed in prehistory.(45)

*Gibson, E.C. (see Cavallaro, R.)(32)*

*Gibson, Jon L. (Southwestern Louisiana, Lafayette)*

#### POVERTY POINT TRADE AND THE ARCHAIC-WOODLAND TRANSITION.

Fresh data and powerful analytical models are casting new light on Lower Mississippi Valley trade during the Archaic-Woodland transition between 2500 and 800 B.C. Previous conclusions regarding the importance of foreign and local industrial raw materials and the primacy of the Poverty Point site have been reaffirmed. However, instead of a single long-lasting exchange system, a more complicated picture involving several localized networks centered around large strategically located villages now seems indicated. While fulfilling basic domestic needs, it appears that some materials, especially exotics, were not uniformly accessible and may, at the Poverty Point site, have led to institutionalized inequalities.(40)

*Gilman, Patricia A. (Amerind Foundation)*

#### CHANGING SUBSISTENCE AND THE ROLE OF CERAMICS.

The role of ceramics in an early agricultural complex is examined. Analysis is based on pottery from the Wind Mountain site, a well dated settlement in southwestern New Mexico. This site has a particularly long sequence, beginning in the earliest Mogollon ceramic period. Specifically discussed in terms both of their first appearances and their changes through time are 1) abundance of ceramics, 2) pottery forms, and 3) design elements. Implications of these changes for understanding the transformations in subsistence strategies are considered.(50)

*Goodyear, A.D.(46)*

*Gore, B.H. (see Long, A.)(23)*

*Graffam, Gray (Toronto)*

#### TIWANAKU INTENSIVE AGRICULTURE: EVIDENCE OF RAISED FIELD CULTIVATION FROM LUKURMATA, BOLIVIA.

The recent excavation of Tiwanaku raised fields at Lukurmata, Bolivia is discussed in terms of agricultural production and implications for Tiwanaku economic and political organization. This paper describes the structure and morphology of the Lukurmata raised fields, as well as the methods for dating these agricultural constructions, which indicate a Tiwanaku IV-V association. The significance of Tiwanaku raised fields is discussed within the context of indigenous intensive agriculture in the Titicaca basin as a whole. Finally, the paper examines a model for agricultural intensification and land reclamation during the Tiwanaku IV period.(52)

Graham, Elizabeth A. (Royal Ontario Museum)

**A BRIEF SYNTHESIS OF COASTAL SITE DATA FROM COLSON POINT, PLACENCIA, AND MARCO GONZALEZ, BELIZE.**

A synthesis of the excavation data from several coastal sites in Belize is presented: the sites at Placencia in southern Belize, the Colson Point sites in central Belize, and the Marco Gonzalez site at Ambergris Cay. The coastal communities under discussion have Preclassic to Postclassic components and were utilized as bases for a variety of activities through time. The focus is on delineating those factors of trade, resource procurement, and environment about which useful coastal trade generalizations can be made.(47)

Graham, E.A. (see Jones, G.D.)(45)

Graham, E.A. (see Pendergast, D.M.)(2)

Granger, Joseph E. (Louisville)

**MEADOWOOD MORTUARY ACTIVITY: AN EXAMINATION OF TERMINAL ARCHAIC/EARLY WOODLAND DEATH RITUAL IN THE LOWER GREAT LAKES.**

Burial ritual at Morrow Site and similar expressions in New York, Vermont, Southwestern Ontario and Quebec is examined by feature analysis for the systematic relationships of these limited activity components in Meadowood culture. The material and structural elements of mortuary activity are shown to have derived directly from the activities found on habitation sites. The ritual of burial treatment is portrayed as a principal means for socially and ideologically reinforcing territorial boundary maintenance and resource control. An explanation is offered for the appearance of the transitional florescent ritual/artifact congerly known as Middlesex (Adena) at some of these sites.(22)

Green, William (Wisconsin-Madison)

**A PREHISTORIC FRONTIER IN THE PRAIRIE PENINSULA: LATE WOODLAND UPLAND SETTLEMENT AND SUBSISTENCE PATTERNS.**

The 700 year "hiatus" between Hopewell and Mississippian is interpreted using a pioneer settlement model. Immediately upon the Hopewell demise Late Woodland groups began intensive use of previously unoccupied upland headwater areas in the Prairie Peninsula. Early Late Woodland pioneers retained traditional nucleated villages and dependence on aquatic and riverine resources. Later pioneer stages were characterized by a successful upland-oriented economy based on individual household rather than village level organization. This pattern prevailed for about 400 years. Maintenance of distinct ethnic group boundaries and structured contacts among neighboring groups assisted in pioneer groups' survival until the arrival of Mississippian influences.(10)

Gregg, S. (see Kintigh, K.W.)(44)

Griffin, J.B. (40)

Grimes, J.R. (see Spiess, A.E.)(46)

Grosboll, Sue (Wisconsin, Madison)

**"... AND HE SAID IN THE TIME OF THE YNGA, THEY PAID TRIBUTE AND SERVED THE YNGA".**

Early colonial documents for the Huanuco region provide testimony to the character of provincial Inka governance of the region. But beyond the large administrative center of Huanuco Pampa, archaeological evidence for the Inka conquest is minimal in the villages of the region. The scarcity of observable Inka traits in ceramics, architecture, and settlement pattern suggests a low level of interaction between conqueror and conquered. However, this archaeological reconstruction must be evaluated in light of the colonial evidence. Together they provide an outline of the character of provincial Inka influence and suggest new approaches in searching archaeologically for evidence of the impact of the Inka.(41)

Gross, G. Timothy (California, La Mesa) and Fekri A. Hassan (Washington State)

**HOLOCENE PREHISTORIC SUBSISTENCE AND POPULATION IN SIWA OASES.**

Reconstruction of the amount, kinds, seasonality and spatial patterns of available water and potential food plants and animals was combined with an examination of archaeological remains from a variety of sites around Siwa, Gara, and El-Areg to infer probable subsistence patterns and population size and mobility in the Siwa Oasis region. The results indicate a small regional population composed of several bands. Seasonal availability of resources and water in the desert surrounding the oases apparently led to excursions into the desert during the rainy season and reoccupation of sites around permanent water holes during the dry season.(14)

Grynopas, M.D. (see Hancock, R.G.V.)(1)

Guderjan, Thomas H. (Institute of Texan Cultures), James F. Garber (Southwest Texas State), and Herman A. Smith (Corpus Christi Museum)

**MAYA TRANSHIPMENT POINTS AND FACILITIES ON NORTHERN AMBERGRIS CAY, BELIZE.**

During the Terminal Classic, the Maya established a series of transshipment points along the coast of Ambergris Cay. Artificial canals and port facilities were also constructed. Architectural and ceramic evidence from San Juan, the best known site, indicate that northern Yucatecan influences were strong and that the site was fully participating in the maritime trade network. San Juan is connected to the Caribbean by a 1 km canal which now separates the island from mainland Mexico. Analogous sites have been found on the windward side in equally strategic locations.(47)

Gummerman, G.(54)

Gurfinkle, D.M. (Toronto)

**DIFFICULTIES ASSOCIATED WITH THE ANALYSIS OF ORGANIC ARCHAEOLOGICAL RESIDUES.**

While the potential applications of organic residue analysis are exciting, major problems exist with the use of this type of analysis as part of an archaeological evaluation. These are due to the fact that organic material is generally very poorly preserved, often only being present in trace amounts and often in an altered and/or degraded state. How these factors complicate a residue recovery analysis and identification will be illustrated from the author's experience with blood residue detection.(15)

Haas, Herbert (SMU)

**HOLOCENE AND LATE PLEISTOCENE CHRONOLOGY IN THE WESTERN DESERT AND THE NILE VALLEY OF EGYPT.**

Conventional radiocarbon dating has been used to determine paleoclimatic variations and to study prehistoric activity of man. The earliest dates are from gastropod shells and from inorganically formed carbonates and relate only through typo-stratigraphic correlation to human activity. Between 20-18,000 years BP, numerous charcoal dates prove human presence in the Nile Valley. Subsequently, there are almost no reliable dates until the early Holocene wet interval in the Western Desert between 9500 and 5800 BP. After 5000 BP dates have become more numerous and lead into the Predynastic and Old Kingdom periods. Climatic information is available for the Holocene from dates measured on groundwater or wellwater, on carbonaceous deposits (tufa) and on organic layers found around and in former playa lakes. There is general agreement between evidence of occupation in the area and increased rainfall with presence of dispersed water bodies.(14)

Habicht-Mauche, Judith, John Hoopes, and Michael Geselowitz (Harvard)

**WHERE'S THE CHIEF?: THE ARCHAEOLOGY OF COMPLEX TRIBES.**

This paper examines some of the problems inherent in the identification and interpretation of tribal forms of social organization from archaeological data. In so doing, the concept of the complex tribe is formulated and defined. In complex tribes, rank and status portions exist, but leadership continues to be vested in corporate and familial institutions. The authors believe that, archaeologically, such societies often have been misinterpreted as centralized chiefdoms. Confusion stems from attempts to equate Fried's model of ranked societies with Servis's chiefdom model. The archaeological evidence for complex tribes, then, is presented from three culture areas—the American Southwest, Lower Central America, and Temperate Europe.(32)

Hagstrum, Melissa B. (UCLA)

**AN ETHNOARCHAEOLOGICAL STUDY OF CERAMIC USE-LIFE, BREAKAGE, AND DISCARD IN THE CENTRAL ANDES, PERU.**

This paper examines the domestic use-life, breakage, and discard of contemporary Wanka ceramic vessels in an effort to quantify demand for these ceramic products. Evidence was gathered from 200 households in 18 villages for each vessel in the household ceramic assemblage. Two vessel types were studied: cooking ollas and liquid storage/transport porongos. As indicated in previous studies, cooking vessels have a considerably shorter use-life than storage/transport vessels and so are in greater demand. The demand for cooking vessels by 100 households supports one specialist ollero producing unit; the demand for storage/transport vessels by 1000 households supports one specialist porongero producing unit.(50)

Hall, Barbara A. (Arizona)

**MESOAMERICAN TEXTILE EXCHANGE AND SPINDLE WHORLS AT MATACAPAN, VERACRUZ, MEXICO.**

Cotton cultivation and textile manufacture are known to have been important industries in Mesoamerica, but have been infrequently studied archaeologically. One byproduct of this industry that

preserves well is the spindle whorl. Quantitative and qualitative variation in spindle whorls at Matacapán, Veracruz, Mexico, can be related to other aspects of intrasite household variation. Ethnohistorically the Tuxtla Mountains region was known as an important cotton manufacturing area, and it is suggested that this industry came to prominence with an increase in interregional trade facilitated by contact with Teotihuacan.(30)

*Halsey, John R. (Michigan Department of State) and James L. Martindale (Michigan Department of Natural Resources)*

**THE SACK OF THE INLAND SEAS: SHIPWRECK PLUNDERING IN THE GREAT LAKES.**

Advances in remote sensing technology have exposed shipwreck sites on the bottomlands of the Great Lakes to predation on a major scale. With a ready market for artifacts, rich sites located far from land observation and insufficient law enforcement capability mean that a virgin wreck discovered at the beginning of the dive season might be stripped by the end of that season. Michigan, with 38,504 square miles of Great Lakes bottomlands, has been forced to actively combat the theft of this maritime heritage. The scope of the problem, the market for artifacts and Michigan's response are addressed.(2)

*Hamilton, Nathan D. (R.S. Peabody Foundation)*

**THE NEVIN SITE: RECONSTRUCTING SUBSISTENCE PATTERNS AND ACTIVITY AREAS.**

Nevin is a stratified site in central Maine with Moorehead complex, Susquehanna tradition and ceramic period occupations. Detailed analysis of the faunal sample allows reconstruction of the subsistence pattern and seasonal nature of resource procurement. Spatial analysis of all artifact classes is presented to define site activity areas. The most intensive occupation at the site was during the Late Archaic period and faunal remains for this period are well represented. The maritime nature of the subsistence pattern related activity areas are correlated with Archaic and Ceramic period sites elsewhere in local and regional contexts.(34)

*Hamilton, N.D. (see Petersen, J.B.)(22)*

*Hamilton, Rachel J. (New College of USE, Sarasota)*

**THE ARCHAEOLOGICAL MOLLUSCA OF CERROS, BELIZE.**

More than 14,000 archaeological mollusks from Cerros, Belize, represent the largest Preclassic collection ever obtained from a single site in Mesoamerica. The results of the analysis are presented, comparisons with other Preclassic collections are made, along with observations on the prehispanic diet and ecology of Cerros.(25)

*Hammond, Norman (Rutgers)*

**INVESTIGATIONS AT CUELLO, BELIZE, 1987.**

Extensive excavations at the Early through Late Formative site of Cuello in northern Belize from 1978 through 1980 demonstrated the presence of an early community dated by radiocarbon to the second millennium B.C., with competent pottery, maize agriculture, and plastered-platform architecture marking the inception of the lowland Maya cultural tradition. Major architecture was constructed in the Late Formative period after 400 B.C., and a number of ceremonial features including mass sacrifice and stela erection were documented. The present paper reports on limited further work at the site, including the excavation of Middle and Early Formative buildings and the recovery of very small radiocarbon samples for accelerator dating.(57)

*Hancock, R.G.V. (SLOWPOKE Reactor, Toronto), M.D. Grynps (Mt. Sinai Hospital) and K.P.H.*

*Pritzker (Mt. Sinai Hospital)*

**BONES LIE.**

The concept that one may establish ancient diets by the trace element analysis of recovered bones is an enchanting one. Much research has been directed to the analysis of ancient bones and to diagenetic effects on them. This paper presents analytical information on clean modern bone (human), Egyptian mummy bones, soil buried bones, old bone from a Florida bog, and some modern Rhesus monkey bones. These data show that the link between dietary information and trace elements found in ancient bones is extremely tenuous at best.(7)

*Hancock, R.G.V. (see Julig, P.J.)(46)*

*Hancock, R.G.V. (see Sheppard, P.)(16)*

*Hanks, Christopher C. (Prince of Wales Northern Heritage Centre) and David Pokotylo (UBC)*

**THE MACKENZIE VALLEY: A RECONSIDERATION OF THE DENE.**

An increasingly active involvement in archaeology by the Dene of the Mackenzie, and the shift of researchers from the pursuit of cultural historical to ethnoarchaeological research has begun to change the way the archaeological record is viewed. New hypotheses are being postulated based upon the

integration of oral history, contemporary material culture, land use, and sites. These models are being used to examine culture and land use change via the variability between the prehistoric, historic and contemporary periods.(59)

*Hansell, Patricia (Temple)*

**CRAFT SPECIALIZATION, REGIONAL EXCHANGE AND SOCIETAL TRANSFORMATION IN THE CENTRAL PANAMA FORMATIVE.**

Prior to 1000 B.C. human occupation in Central Panama is represented by small mobile egalitarian groups; by the 1st millennium B.C. some groups have begun to permanently settle at a few large sites, with the largest being the 65 ha site of La Mula-Sarigua. Regional settlement data suggest a tremendous reorganization of human groups rather than a significant population increase. Further, an extensive examination of material assemblages, particularly lithic assemblages, from La Mula-Sarigua suggests the initial appearance of craft specialization and regional exchange. This paper describes the evidence for these two features, their role in societal integration and their implications for the development of a hierarchically-ordered power structure.(57)

*Hanson, C. (see Ringle, W.M.)(57)*

*Hanson, Diane K. (Simon Fraser)*

**SUBSISTENCE PATTERNS DURING THE DEVELOPED COAST SALISH PHASE ON THE NORTHWEST COAST.**

Using faunal reports from sites on the eastern coast of Vancouver Island, the adjacent mainland of Washington and British Columbia, and intermediate islands, the picture of regional subsistence during the Developed Coast Salish Phase (1200 B.P. to Contact) becomes clearer. On the mainland the use of diverse large terrestrial mammals, the increased use of salmon versus rockfish on major rivers and the availability of sturgeon and numerous shellfish associated with sand flats is different from island patterns. Subregional heterogeneity is also discussed. (25)

*Harbottle, Garman (Brookhaven National Laboratory) and Phil C. Weigand (SUNY, Stony Brook)*

**TURQUOISE IN THE ANCIENT MESOAMERICAN TRADE STRUCTURE.**

Turquoise played an important role in the particularistic trade configurations called networks, and in the perdurable trade structure in ancient Mesoamerica. Its popularity grew exponentially, till in the Postclassic periods it had become more prevalent than jade in many areas. It is the purpose of this study to examine turquoise procurement and exchange through time in order to illustrate the basis that the commodity had in an early trade structure. Mining per se will be discussed, along with the recent results of neutron activation analysis in identifying artifact clusters and sources.(40)

*Harritt, R.K. (Oregon)*

**A MODEL FOR ANALYSIS OF LATE PREHISTORIC OCCUPATION OF THE NAKNEK REGION, SOUTHWEST ALASKA.**

A model of the socioterritorial characteristics of historic Eskimo groups of north Alaska, the Bering Sea region and Bristol Bay is presented. The utility of this model is then tested by reviewing ethnographic, linguistic and archaeological data that are currently available from the Naknek Region. The result of this analysis is the conclusion that the late prehistoric occupants of the region comprised a society which possessed its own technological, linguistic and social characteristics. If viewed in this context, the late prehistoric occupants of the region can be viewed as participants in an operative social system rather than as facies of Bering Sea or Kodiak Island cultures.(7)

*Harrold, Francis B. (Texas, Arlington)*

**THE CHATELPERRONIAN AND THE EARLY AURIGNACIAN IN FRANCE.**

The beginning of the Upper Paleolithic in France is characterized by two culture-stratigraphic units, the Chatelperronian (or Lower Perigordian) and the early Aurignacian ("Aurignacian O"). Interstratification and other evidence indicate that these traditions were contemporaneous, but the nature of the relationship between them is not at all clear. Do they represent different cultural traditions, different adaptive patterns, or different structural poses of the same adaptive system? Available artifactual, paleoenvironmental, and contextual evidence is reviewed in order to clarify, if not resolve, the problem, and to suggest directions for further research.(4)

*Hassan, Fekri A. (Washington State)*

**INTERPRETING REGIONAL AND INTERREGIONAL VARIABILITY IN THE HOLOCENE ARCHAEOLOGY OF THE WESTERN DESERT, EGYPT.**

Interpreting the Holocene archaeological record in the Western Desert of Egypt is best approached from a consideration of the spotty distribution of oases and depressions which served as vital and



nodal points from which regional groups expand and contract, responding to seasonal and climatic changes. Although variations in the kinds of encampments and functions performed are responsible for some changes in lithic assemblages, the intensity of association with a home-oasis, spatial distance between water holes, and pervasive demographic flux were causally linked with social interaction.(14)

*Hassan, F.A. (see Gross, G.T.)(14)*

*Hassen, Harold (Illinois State Museum)*

**ORGANIZATIONAL VARIABILITY IN CHIPPED STONE ASSEMBLAGES, PART TWO: A LATE WOODLAND CASE STUDY.**

An analytical framework for understanding technological responses to contextual variations is developed. Expectations for and variables of the organizational character of expedient and curated assemblages are derived from the model and previous research. Two case studies (see Wiant, this symposium) are used to evaluate the validity of these relationships. This paper concerns Late Woodland chipped stone artifact assemblages from functionally different sites with different access to lithic resources. Both debitage and shaped artifacts are analyzed. Difference in the assemblages are attributable to variations in adaptive response. Based on the results of the previous Middle Woodland case study, similarities and differences through time are described and discussed.(9)

*Hawkes, K. (see O'Connell, J.E.)(44)*

*Hayden, Brian and Rob Gargett (Simon Fraser)*

**SPATIAL STRUCTURE IN AUSTRALIAN HUNTER/GATHERER CAMPSITES.**

Little attention has traditionally been devoted to the implications of spatial patterning of individual structures in hunter/gatherer campsites, either archaeologically or ethnographically. Very little data exist to indicate under what conditions hunter/gatherers camp close to each other or far away from specific configurations such as linear or circular arrangements of structures. Data were collected from a large Aboriginal campsite in the Australian Western Desert in order to help elucidate some of the structuring principles involved in the spatial patterning of campsites.(44)

*Haynes, Gary (Nevada, Reno)*

**SPIRAL FRACTURES, FLAKED BONES, CUTMARK MIMICS, AND OTHER CHARACTERISTICS OF NONCULTURAL ELEPHANT-BONE ACCUMULATIONS IN AFRICA.**

Modern noncultural elephant-bone accumulations in Africa contain attributes identical to those interpreted in fossil assemblages as end-effects of human activities. Such attributes include (1) limb-bone fragmentation and flaking due to trauma, carnivore feeding, or trampling; (2) tusk fracturing in life, creating fragments that can be mistaken for tools; (3) cutmark mimics caused by trampling; (4) skeletal postures that might reflect agency or abruptness of death. The massive elephant-bone accumulations under study are also unique sources of data about the extent of information loss which death processes create in bone samples.(15)

*Hays, Christopher (SUNY Binghamton)*

**STORING FOOD AND STORING CORPSES IN PREHISTORIC TENNESSEE.**

The burial of corpses in storage pits was a relatively common phenomenon in Southeastern prehistory. Rejecting the traditional explanation of this practice as expedient behavior, this analysis explores the possibility that actively manipulated symbolic links were drawn between the disparate processes of inhumation and food storage. To this end, formal structural similarities between mortuary treatment and food storage techniques are noted at Terminal Archaic and Middle Woodland sites in Middle Tennessee. Data from both ethnohistoric texts and general analyses on mortuary ideology are then considered in an attempt to link the formal similarities to specific ideologies and social strategies.(60)

*Hays, John D. (New Mexico)*

**CATCHMENT WALLS: ENVIRONMENTAL ENHANCEMENT OF A VOLCANIC MESA ESCARPMENT.**

West of Albuquerque, New Mexico a line of small volcanic cones marks the western edge of the Middle Rio Grande Valley rift. Volcanic flows from this rift have formed the impermeable caprock of Albuquerque's West Mesa. Surveys of the mesa top and escarpment have revealed large numbers of low rock walls along drainages and above and below the escarpment. Many of the walls are only one course high. Originally the walls were thought to mark prehistoric agricultural fields, but subsequent evaluation suggests that they may have served to enhance water and soil retention for naturally-occurring plants.(26)

*Healy, R.E. (47)*

*Heller, Craig and Lawrence G. Straus (New Mexico)*

**EXPLORATIONS OF THE TWILIGHT ZONE: THE EARLY UPPER PALEOLITHIC OF CANTABRIA AND GASCONY.**

Models of Middle Paleolithic and late Upper Paleolithic (Solutrean and Magdalenian) hunter-gatherer adaptations in Cantabrian Spain and adjacent SW France have been put forth recently by Freeman, Butzer, Straus, and others. However, less has been done with the early Upper Paleolithic (Aurignacian and Perigordian) in these regions, perhaps due to the relative scarcity of modern excavations. While there were changes in human anatomy and tool technology at ca. 35,000 B.P., changes in faunal exploitation and settlement pattern are less evident, suggesting that the full shift to "modern" patterns of adaptation was rather more gradual, perhaps taking as long as ca. 15,000 years. These involved organizational changes.(4)

*Helms, Mary W. (North Carolina, Greensboro)*

**TRAVEL MOTIVES, ELITE ASPIRATIONS, AND THE COSMOLOGICAL CONTEXT OF GEOGRAPHICAL DISTANCE.**

Understanding the significance of interregional interaction requires understanding indigenous motives and meanings involved in long-distance contacts. Ethnographic and ethnohistoric data are utilized 1) to illustrate the cosmological significance accorded geographical distance in native perceptions of space; 2) to review the diverse motives underlying long-distance travel, especially those relating to acquisition of political-ideological esoteric knowledge; 3) to summarize the major contexts in which political elites are involved in long-distance travel or with foreigners. It will be generally argued that knowledge of and association with long-distance phenomena actively enhances the legitimacy accorded leaders as exceptional persons with fuller understanding of the "inherent" powers and processes of their society's cosmos.(8)

*Helskog, Knut (Tromso Museum)*

**CHANGING ROCK ART, CHANGING SOCIETY? THE CASE OF THE STONE AGE FISHER-HUNTER-GATHERERS OF ARCTIC NORWAY.**

The analysis of the rock-carvings in Alta indicate that there are five contemporaneous changes between the carvings and other spheres of culture among the area's fisher-hunter-gatherer population. The changes in the carvings are particularly noted in the form of the figures and partly in what is depicted. There are, in addition, some continuities in form as well as in the selection and frequencies of the figures. The paper discusses to what degree the relationship between rock art and the general archaeological record extends beyond chronology and reflects changes in society and beliefs.(38)

*Henning, W. (see Taylor, R.D.)(23)*

*Henrickson, Elizabeth E. (Royal Ontario Museum)*

**IDENTIFYING THE FUNCTION OF AN ABUNDANT, ENIGMATIC VESSEL TYPE FROM AN IRANIAN CHALCOLITHIC FARMING VILLAGE.**

More than a third of all sherds excavated in the Period VII levels at Seh Bagi (ca. 3100-2900 B.C.) are from a distinctive pottery vessel type of uncertain function, perhaps used for bread-making or grain processing. These often smoke-blackened vessels, made of chaff-tempered coarse ware, have slightly concave bases and incurved walls. Below the rim, with its two opposed horizontal handles, a row of small holes pierce the vessel wall. Distribution within excavated houses and trash deposits, and vessel use-wear patterns provide evidence for vessel function. Similar vessels from other archaeological and ethnographic contexts are also discussed.(50)

*Henrickson, Robert C. (Royal Ontario Museum)*

**POTTERY PRODUCTION AND CONSUMPTION IN AN IRANIAN BRONZE AGE TOWN.**

Detailed stylistic analysis of painted pottery vessels found in situ in Level 4 of Period III (ca. 2000 B.C.) at Godin Tepe, Iran, yields definition of a limited number of distinct yet inter-related groups based on choice, arrangement, and rendering of motifs. Examination of morphological and technical attributes indicate each group probably represents the work of an individual potter/painter. Analysis of the overlapping distributions of these groups among the excavated houses and graves delineates ceramic marketing patterns within the settlement, valley and region.(50)

*Herlihy, Peter H. (Southeastern Louisiana) and Frederick M. Wiseman (MIT)*

**THE MAYA DOORYARD ORCHARD-GARDEN.**

In this paper the Maya dooryard orchard-garden is described from field work in northern Belize and elsewhere in the Maya area. Recent archaeological evidence and the ethnohistoric record support the

argument that the dooryard orchard-garden has played an important role in Maya subsistence since pre-Hispanic times. Maya dooryard orchard-gardens are intensively managed agro-ecosystems that place heavy emphasis on the cultivation of semi-domesticated fruit trees. The gardens, in part, help explain the dispersed pattern of pre-Hispanic Maya settlement and are here speculated to be the most prominent component of the ancient Maya landscape away from the large ceremonial centers.(42)

*Herscher, Ellen (American Association of Museums)*

#### THE ROLE OF MUSEUM ACQUISITION POLICIES.

Museums are widely recognized as an important link in the commercial chain of the antiquities market, and the museum profession has formally acknowledged the relationship between that market and the often destructive initial taking of an object. To play an active role in combating the illicit trade, individual institutions and professional organizations have, over the past two decades, developed ethical codes and policies governing acquisitions. Most comprehensive among these is the Code of Ethics of the International Council of Museums (ICOM), adopted in November 1986. While it is impossible to police adherence to such voluntary standards, evidence suggests widespread acceptance by museums of public responsibility in this area.(2)

*Hicks, Patricia A. (Desert Research Institute)*

#### THE USE OF ATTRIBUTES OF DEBITAGE ASSEMBLAGES AS TEMPORAL INDICATORS.

In many areas a large portion of the archaeological record is composed of surface scatters of flaked stone tools and debitage that are undatable by traditional methods. Lacking temporal control, these sites are eliminated from consideration in model building and testing. This can lead to erroneous regional and cultural interpretations because a considerable portion of the data base has been omitted. This paper examines the potential for using debitage attributes as temporal indicators. The results of a temporally oriented analysis of a large samples of debitage from 34 dated and undated contexts in north-central New Mexico are then presented and evaluated.(56)

*Hietala, H. (Southern Methodist)*

#### CHANGES IN SOCIAL ORGANIZATION AT THE MIDDLE PALEOLITHIC TRANSITION SITE AT BOKER TACHTIT.

The Middle to Upper Paleolithic transition site of Boker Tachtit, Israel, possesses three undisturbed occupational floors from which distinct spatial patterns emerge. These patterns are interpreted according to a settlement pattern model positing a local Middle to Upper Paleolithic transition from a radiating pattern to a circulating pattern. The intrasite patterns are then explored relative to changes in social organization.(44)

*Hodges, Denise C. (Connecticut Health Center, Farmington)*

#### POLITICAL SYSTEMS AND HEALTH PATTERNS IN THE PREHISPANIC VALLEY OF OAXACA, MEXICO.

Changes in political systems and concomitant social changes may potentially affect a population's health. Health patterns are examined with the development of a regional political system in the Valley of Oaxaca. Human skeletal remains (n = 232) from the Early Formative through the Postclassic were examined for stress markers. The frequencies of the markers are compared among three groups: before the development of the regional system (1400-500 B.C.), as the system matured (500 B.C. - A.D. 650), and after its decline A.D. 650-1400). No significant differences in marker frequencies are observed among the groups, suggesting that the development of a regional political system had no deleterious health effects.(30)

*Hoffecker, John E. (Argonne National Laboratory)*

#### EARLY UPPER PALEOLITHIC SETTLEMENT ON THE RUSSIAN PLAIN.

Upper Paleolithic industries were probably established on the Russian Plain by the end of the first half of the Middle Pleniglacial (i.e., >40,000 B.P.). Sites occupied prior to the end of the Bryansk Interstadial (ca. 25,000 B.P.) may be considered "early Upper Paleolithic." Most sites are concentrated in the Middle Dnepr Valley and along the Middle Don River, the vast Dnepr-Desna Basin appears to have been largely uninhabited during this period. West and Central European culture-stratigraphic classifications cannot be effectively applied on the Russian Plain, where artifact assemblages manifest a robust native character and considerable diversity. Symbolic items (ornaments and decorated pieces) have been recovered from many localities. There is some evidence of a Middle/Upper Paleolithic transitional industry in the Middle Dnepr Valley.(4)

*Hohman-Caine, Christy A. (USDA Forest Service/Minnesota State Archaeologist's Office)*

#### THE TRANSLATION OF LAW INTO REALITY: CRM ON A NATIONAL FOREST.

NHPA, ARPA, AIRFA, NEPA, and the NFMA — what is the reality of applying these laws to actual management of cultural resources on the ground? This case example of the Chippewa National Forest

in Minnesota looks at the translation of law and regulation into practice. The Chippewa overlaps with the Leech Lake Indian Reservation, shares CRM responsibilities with other bureaucracies, and has an interspersed state, private, and Indian ownership pattern. This paper examines the past track record and looks ahead to future practice including the application of the newly completed Forest Plan, part of the Forest Service's "Integrated Resource Management" approach.(54)

*Hole, E. (23)*

*Holland, Kathryn M. and C.G. Turner II (Arizona State)*

#### PREHISTORIC ALEUTIAN DOGS.

Stratigraphic, associational, and absolute dating demonstrate that dogs were present in the eastern Aleutian Islands in the prehistoric period. Prior to excavations at Chulka on Akun Island it was generally believed that dogs did not exist in the prehistoric Aleutian culture. The discovery of prehistoric dog remains at Chulka requires revision of this viewpoint. Analysis of the dog crania suggest a closer affinity with Kodiak dogs than with other dog populations in Alaska which indicates an interaction between Chulka and Kodiak that extended back at least 1000 years.(25)

*Holley, G.R. (see Collins, J.M.) (10)*

*Holmes, D.L. (Institute of Archaeology, London)*

#### THE ARCHAEOLOGY OF POST-PALAEOLITHIC SITES FROM NORTHERN KHARGA OASIS, EGYPT.

An archaeological survey and analysis of lithic artifacts from sites in Umm El-Dabadib area, Kharga reveal that the sites, called here "post-palaeolithic," date to the middle Holocene and are associated with playa deposits of a moist phase. The majority of the assemblages belong to a single tradition to which the later sites from Kharga Airport "Neolithic" sites are related. The assemblages show close similarities to those from Dakhla, and some similarities with others from Baharia, Lobo, W. Bakht and Dungul. Similarities with the Tarifan of the Nile Valley and between late Post-Palaeolithic assemblages in Kharga and Predynastic sites indicate frequent Saharan-Nilotic cultural exchanges.(14)

*Hommon, Robert J. (U.S. Navy; Pearl Harbor, Hawaii)*

#### NEW PERSPECTIVES ON HAWAIIAN ARCHAEOLOGY.

Concepts developed in recent work of Sahlins, Valeri, and others generate powerful new perspectives from which to view the Hawaiian archaeological record. Aspects of Hawaii's pre-contact history, including the formation of territorial units and polities, the decoupling of the aristocratic and common classes, and the nature of the high status settlements at Kealakekua Bay, Hawaii Island are discussed as they related to notions such as hierarchical solidarity, heroic segmentation, heroic history, the performative nature of Hawaiian society, and the importance of sacrifice in Hawaiian culture.(55)

*Hooge, P. (see Ruffini, E.) (2)*

*Hoopes, J. (see Habicht-Mauche, J.) (32)*

*Horne, Lee (Pennsylvania)*

#### READING VILLAGE PLANS.

The spatial layout of archaeological sites and structures carries information potentially valuable to those trying to make sense of the past. Order in settlement plans takes forms such as common orientation of structures, organization around focal space or structures, repeating house shapes or blocks, and enclosures and enclosures. The absence of order itself carries information. An ethnoarchaeological approach to contemporary Middle Eastern villages helps to expose the ways in which layouts are shaped by climate, terrain, social relations, tenure arrangements, and world view and to discuss them in terms useful to archaeologists.(27)

*Horowitz, Victoria D. (Kentucky, Lexington)*

#### EXPERIMENTS ON COOKED BONE BREAKAGE.

Experiments on cooking bone several different ways and then breaking them with various techniques is aimed at controlling the breakage marks left on cooked bones. The same breaking pattern was performed on fresh bone first and then applied to boiled and barbecued bone as well. Bones were then buried and will be monitored year after year. Also, a second set of bones will be left weathering and will be monitored in order to see weathering patterns under controlled conditions.(15)

*Hsu, Jeffrey T. (Cornell)*

#### UPLIFT OF THE PERUVIAN COAST BETWEEN 13.5 AND 16S LATITUDE.

Raised abrasion platforms between 13.5 and 16S latitude on the Peruvian coast represent the geomorphic expression of paleo-sea levels. These features are firm evidence that this segment of the

Peruvian coast has risen during the late Pleistocene. A maximum possible uplift rate of 1.2 mm/yr is found at 15.3S latitude near San Juan de Marcona. Other parts of this coastal segment have been rising more slowly. Though different from other parts of the Peruvian coast some of the principal results of this study, such as magnitudes of uplift rates and causes for tectonic uplift, can still be applied to better understand the tectonic environment of other study areas. This purely geologic investigation is concerned with events on a much longer time scale than most archaeological studies, but provides some criteria with which to evaluate to what extent uplift may affect the coastal geomorphology of inhabited areas.(6)

*Huelsbeck, David R. (Santa Clara)*

#### HALIBUT LIVE WEIGHT AND PREHISTORIC FISHERIES ON THE OLYMPIC PENINSULA.

Accurate estimates of live weight are important components of many archaeological questions, e.g., MNI, amount of represented food, exploitation strategies, etc. Linear regression equations are derived relating halibut vertebral width and life weight within narrow confidence limits. Application of the equations to archaeological specimens demonstrates that the halibut captured prehistorically off the Olympic Peninsula were smaller than historic averages, does not affect MNI estimates (in these cases), and suggests variation in fish size through time/space and/or variation in resource area control.(25)

*Hunt, T.L. (Washington)*

#### CERAMIC STYLE AND PATTERNS OF PREHISTORIC HUMAN INTERACTION IN THE FIJI ISLANDS.

Analysis of stylistic variation in Fijian ceramics from widespread geographic and temporal contexts is the basis for a model of change in the pattern and scale of human interaction. Such interaction is considered a key element in explaining the evolution of human similarities and differences known for the Fiji Islands. The available evidence points to the importance of isolation as a condition allowing diversification. However, isolation is shown to be not simply geographic, but also results from dynamic social and historical factors.(55)

*Hunter-Anderson, Rosalind L. (Guam)*

#### THE CHANGING ROLE OF SMALL STRUCTURAL ANASAZI SITES IN THE NORTHERN RIO GRANDE.

The role of small structural Anasazi sites in the changing settlement system and pattern of land use in the northern Rio Grande during A.D. 1175 to A.D. 1450 is investigated. Data indicating small site functional differences over time come from three areas: Cochiti Reservoir/Dam, Bandelier National Monument, and the northern Pajarito Plateau. Three hypotheses accounting for these differences and some of their archaeological implications are presented.(26)

*Irving, William N. (Toronto)*

#### NEW DATES FROM OLD CROW.

Flakes of proboscidean bone excavated from strata below a stratum deposited by a pro-glacial lake of late Wisconsin age in the Old Crow Basin, Yukon, have been radiocarbon dated by AMS (Isotracer) to between 22,000 and 43,000 B.P. This paper will discuss these specimens and their significance for early man studies in the New World.(19)

*Irwin-Williams, C. (40)*

*Ives, David J. (Missouri-Columbia)*

#### "EXOTIC" CHERTS AND THE HOPEWELL INTERACTION SPHERE.

The Hopewell Interaction Sphere was a socio-cultural phenomenon based, in part, on the procurement/exchange of non-local raw materials. One of these materials - chert - usually is cited as originating at one of several specific quarrying areas. However, the criteria for such source assignments seldom are explicated and may be based on second-hand data, "looks like" cognition, incomplete knowledge of the raw material's variability, or archaeological folklore. The scope of this problem, and its implications, are examined; models such as the HIS may be strengthened through explicative and quantitative resolutions.(31)

*Jackson, Lawrence (Northeastern Archaeological Associates), Heather McKillop (California, Santa Barbara), and Susan Wurtzburg (SUNY, Albany)*

#### FOLSOM AND YUMA ARTIFACTS, 1934: A CHALLENGE TO CANADIAN ARCHAEOLOGY.

This paper discusses the role of Canadian Palaeo-Indian material in the original conceptualization of Folsom culture by Jesse Figgins, Director of the Colorado Museum of Natural History. It investigates the discovery of fluted points in Ontario in 1933 and attempts by Figgins and Canadian colleague W.J.

Patterson to alert Canadian authorities to its existence. Background events are examined in the light of correspondence between Figgins and Patterson and other documents surviving from the 1930's. Insight is provided into the historic development of Canadian Palaeo-Indian studies.(22)

*Jackson, L. (see McKillop, H.)(47)*

*Jacobi, K.P. (see Borstel, C.L.)(49)*

*Janes, Robert R. (Science Institute of the N.W.T., Canada)*

#### SOME METHODOLOGICAL CONSIDERATIONS IN NORTHERN ATHAPASKAN ARCHAEOLOGY.

The deliberate observation of contemporary northern hunters is one way of enhancing the interpretation of the archaeological record in the western Canadian Subarctic. This paper is based on six months of archaeological ethnography, followed by archaeological excavation at the same residential camp in the Mackenzie Valley, Northwest Territories, Canada. This allowed the investigation of relationships between observed behavior and its material expressions. Suggested guidelines for recognizing tipis in the absence of architectural remains are discussed, as are considerations for discerning activity patterns within this type of dwelling.(59)

*Jarvis, H.W. (Buffalo)*

#### INAA PROVIDES EVIDENCE OF EFFICIENT POTTERY MAKING TECHNOLOGY AT THE KEFFER SITE, ONTARIO, CANADA.

Samples from the Keffer Site (Huron pottery) were compared with clay samples from the immediate area using a suite of trace elements obtained through the SLOWPOKE Reactor Facility, University of Toronto. The results indicate that the Huron potter was using local naturally tempered clay in his manufacturing technology. This factor would have made the potter more efficient, and may contribute to our understanding of the Keffer site's location which is atypical for Huron sites, insofar as it is practically indefensible.(50)

*Jayaswal, V. (Banaras Hindu)*

#### HUNTER-GATHERERS OF THE TERMINAL PLEISTOCENE IN UTTAR PRADESH, INDIA.

The archaeological records of the Upper Palaeolithic phase in Uttar Pradesh suggest occupation of three different geographical settings by the hunter-gatherers. Incidentally, evidence for the geochronology and the habitation of the terminal pleistocene population is best preserved in this region. On technotypical considerations the culture debris of the period seems to form two groups. The earlier (c. 23,000-17,000 B.C.), was confined to the slopes of the adjoining hills where artefact flaking spots are located near the source of raw material. The later group (post c. 17,000 B.C.), with presumably greater population density, was occupying not only a wider area but also varying geographical settings, such as the rockshelters, slope of the hills, banks of the rivers and the lakes.(20)

*Jochim, M. (4)*

*Johannessen, S. (see Joyce, A.A.)(24)*

*Johnson, Ian (Arkansas Archaeological Survey, Fayetteville)*

#### RECOVERY AND CLASSIFICATION AS A DETERMINANT OF INTERPRETATION.

The concepts of randomness, clustering, and association are examined in relation to pre- and post-depositional factors of archaeological patterning. It is argued that randomness is an inappropriate concept in an archaeological context, and merely reflects an inability to discriminate the patterning present. In addition to the effect of different methods, it is argued that artifact recovery procedures and a priori interpretation embodied in artifact classification can have a significant effect on the results and interpretation of spatial analysis. These effects will be illustrated with examples from Pincevent sector 36 and simulated distributions.(44)

*Johnson, Jay K. (Mississippi) and Samuel O. Brookes (Corps of Engineers, Vicksburg)*

#### BENTON POINTS, TURKEY TAILS AND CACHE BLADES: MIDDLE ARCHAIC EXCHANGE IN THE SOUTHEAST.

One of the earliest and most extensive distribution systems in the Southeast centers on the Tennessee River Valley during the Middle Archaic. The high quality tabular chert which is exposed in the shoals and slopes of the Middle Tennessee in northern Alabama was transformed into a distinctive stemmed biface, a preform type that appears to have been made for export and large, extremely well made bifaces which were probably never intended to be utilitarian. This paper begins at the extensive source area quarry sites, traces the distribution of artifacts and raw material south into the Coastal Plain, and discusses coincident evidence for complex ritual. Distributional networks as large as this one do not occur again in this region until the terminal Archaic, 2000 years later.(40)

*Johnson, Lucy Lewis (Vassar)*

**SHUMAGIN ISLAND RESEARCH: RESULTS FROM THE FRINGE.**

The Shumagin Islands, south of the Alaska Peninsula, are the southernmost and easternmost Aleutian Islands. To their east lies Kodiak island, home of the historic Aleuts' fiercest enemies. Prior to 1984, the Shumagins were almost unknown archaeologically. Fieldwork in 1984 and 1986 has uncovered 35 sites on the 5 outermost islands. Analysis of the collections from these localities has revealed patterns of site location through time and has shed light on the maintenance of boundaries between Shumagin Aleuts and their Koniag neighbors.(7)

*Johnson, Matthew H. (Cambridge, England)*

**THEORY IN TEXT-AIDED ARCHAEOLOGY: A STRUCTURAL APPROACH.**

It is argued that research areas where material culture and written texts coincide provide an opportunity to demonstrate the full potential of structural and symbolic approaches in archaeology. Three reasons for this are discussed: the more direct access to the meaning of material symbols provided by textual evidence; the additional gain in context thus provided; and the greater visibility of active manipulation of material culture by interest groups within society. These propositions are discussed in relation to the particular studies to be presented in the symposium, and the common features of those studies stressed as an alternative approach to text-aided archaeology.(60)

*Jones, E. (see Arundale, W.H.)*(59)

*Jones, Grant D. (Davidson), David M. Pendergast (Royal Ontario Museum) and Elizabeth A. Graham (Royal Ontario Museum)*

**LOCATING THE MAYA TOWNS OF SPANISH COLONIAL BELIZE: ETHNOHISTORICAL AND ARCHAEOLOGICAL STRATEGIES.**

Archaeological and ethnohistorical examination of Lamanai and Tipu, two Spanish period Maya towns in Belize, has underscored the value of interdisciplinary strategies for locating and recognizing the ephemeral remains of such sites in this region. Several other historically known Maya towns remain undiscovered. Ethnohistorical evidence for Spanish period Maya locational strategies is examined, and tentative locations for these towns are assigned on the basis of documentary findings. Predicted characteristics of the surface features of these sites are offered, and a tentative survey strategy is presented.(45)

*Jones, N.B. (see O'Connell, J.E.)*(44)

*Jones, Rhys (Australian National)*

**FROM KAKADU TO KUTIKINA: VARIED RESPONSES AT 18,000 B.P.**

Australia, the continent of hunters and gatherers, encompasses a wide diversity of environments and resources. Whereas in other parts of the world the differences in archaeological records have been put forward as a barrier to comparative studies this is not the case in Australian prehistory. This paper will illustrate the current research techniques and frameworks that have established a continental synthesis of prehistoric hunters and gatherers. The Australian model serves as a continental example of how much wider comparisons of world population at particular time spikes can be achieved and what the returns will be as judged by an increased understanding of variation in hunter-gatherer systems.(20)

*Jopling, A.V. (Toronto), L.A. Pavlish (Toronto) and Z. Zhang (Beijing Normal)*

**SELECTIVE FLUVIAL TRANSPORT OF STONE AND BONE: AN EXPERIMENTAL APPROACH FROM FLUME TO FIELD.**

A recirculating laboratory flume was used to study the sorting and relative transport of archaeological stone and modern bone materials. Fifty-one flume runs were conducted. Bone and stone movement was plotted as a function of rate of movement (cm/sec) with respect to individual mobility numbers. Low transition and upper energy flow regimes show a clear separation in the rate of movement. Settling velocity and drag coefficients are calculated for the material. These results have implication for the understanding of distributions of artifactual material on some archaeological sites, and may provide a key to interpreting the potential for movement on others (i.e., disturbance). The results are applied to field problems.(15)

*Jordan, Richard H. (Bryn Mawr)*

**THE KACHEMAK CULTURAL TRADITION ON KODIAK ISLAND, ALASKA.**

Excavations have been conducted at two Kachemak period sites on Kodiak Island during the summers of 1985 and 1986. Results indicate that numerous sod-house villages with deep midden deposits began at least by the first half millennium B.C. and were established by large and rather

sedentary populations. New data on house forms, features, subsistence economy, external relations, and human disposal patterns will be presented. Surveys and excavations both indicate that Kodiak was a major population center in south Alaska throughout the late Kachemak period. The changing tool styles recovered in successive stratigraphic layers suggest that Kachemak evolved directly into Koniag, contrary to earlier views.(7)

*Joyce, Arthur A. (Rutgers) and Sissel Johannessen (Illinois)*

**THE LA CONCHA ETHNOARCHAEOLOGICAL STUDY: A PRELIMINARY REPORT.**

The La Concha ethnoarchaeological study examines the material remains of a recently abandoned residential unit in rural Mexico consisting of four thatch houses including a kitchen and three living/sleeping quarters. By using interviews with informants the material patterns observed at the site are considered relative to the activities performed during site use and abandonment. Results demonstrate that the processes of site abandonment are not invariable even within a single site, and can significantly affect the material patterns preserved in the archaeological record and, therefore, the behavioral reconstructions of archaeologists.(24)

*Julig, P.J., L.A. Pavlish and R.G.V. Hancock (Toronto)*

**LATE PALEOINDIAN LITHIC PROCUREMENT, REDUCTION AND TRANSPORT IN THE NORTH-WESTERN LAKE SUPERIOR REGION, CANADA.**

Late Paleoindian lithic technological organization is examined in regard to: (1) sources of raw materials; (2) production system for tools, biface preforms and flake blanks; and (3) lithic transport and caches. INAA is used to chemically characterize exotic archaeological lithics as well as potential geological sources. Lithic assemblages are dominated by material from local sources, although some southern exotics are represented. Evidence from recent investigations at the very extensive Cummins Plano period quarry/workshop site in Thunder Bay, Ontario is presented.(46)

*Jull, A.J.T. (see Long, A.)*(23)

*Kann, Veronica M. (Illinois-Urbana)*

**ANTHROPOMORPHIC FIGURINES AS IDEOLOGICAL PRACTICE: TEOTIHUACAN FIGURINES AT MATACAPAN, VERACRUZ, MEXICO.**

Teotihuacan's dominance during the Middle Classic Period is in part evidenced by a wide distribution of artifacts which stylistically link contemporaneous polities with the Central Mexican site. A consideration of the ideological messages encoded in Teotihuacan artifacts found throughout Mesoamerica elucidates the economic and political structure of Middle Classic, Teotihuacan-focused society. A functional and stylistic comparison of the locally-produced Teotihuacanoid figurines recovered from Matacapan with figurines from Teotihuacan reveals a set of codes concerning Matacapaño social positioning vis-à-vis Teotihuacan. Figurines are analyzed as material representations of ideological practices which served to shape and reflect the structure of socio-political domination at the site of Matacapan. These figurines are seen as an indigenous reinterpretation of a foreign ideology rather than an imposition of that ideology through conquest, colonization, or economic domination. Implications for the reconstruction of the political and economic nature of Teotihuacan-Gulf Coast interactions are discussed.(30)

*Kaplan, S.* (21)

*Kardulias, P. Nick (Ohio State)*

**GEOPHYSICAL EXAMINATION OF THE BYZANTINE FORTRESS AT ISTHMA, GREECE.**

Geophysical surveying within the Early Byzantine Fortress at Isthmia in the northeastern Peloponnese has yielded substantial data on the interior layout. The techniques employed include magnetometry, electrical resistivity, soil conductivity, and self-potential. A systematic surface collection has been conducted to correlate surface concentrations with subsurface features. Isthmia was the site of the Panhellenic sanctuary of Poseidon (7th century B.C.-4th century A.D.). The Fortress, dating to the early 5th century A.D., represents a major transformation in site function. The site may thus serve as a laboratory to study the transition from Late Antiquity to the Medieval period in the Aegean.(34)

*Keegan, William F. (South Carolina)*

**STRUCTURAL DETERMINANTS OF LUCAYAN ARAWAK SETTLEMENT PATTERNS.**

Settlement pattern studies tend to emphasize the spatial dynamics of economic production. The result has been a reliance on descriptive economic models of resource allocation to explain settlement-subsistence systems, and a corresponding failure to recognize that economic logic is socially constituted. In this paper the structural logic of tropical forest social organization is used to examine the

distribution of prehistoric social units in the Bahamas. Regional, community, and household patterns of social aggregation and dispersion are considered. At each level, matrilineal descent, dual organization, and sacred natural formations are shown to condition the location and arrangement of Lucayan Arawak settlements.(37)

*Keegan, W.F.* (55)

*Keeley, Lawrence (Illinois, Chicago Circle)*

**LITHIC PRODUCTION AND USE: IMPLICATIONS FOR SPATIAL ANALYSIS.**

The use of space on a site cannot be simply "read off" from the distribution of functionally-identified artifacts. The complicating factors include disposal as refuse and the retooling of hafted tools. Examples from the author's work on Meer, Verberie, and other sites illustrate these points. Methods by which these complications are dealt with are discussed.(44)

*Keeley, L.H. (see Kimball, L.R.)*(9)

*Kelly, Robert L. (Louisville)*

**THE THREE SIDES OF A BIFACE.**

The effect of mobility on hunter-gatherer lithic technology is discussed in terms of three different roles of bifacial tools: as by-products of the shaping process, as cores, and as long use-life tools. The relationship between these tool roles and mobility, as well as their archaeological consequences are discussed. Temporal trends in the use of bifacial tools in the Carson Sink and Stillwater Mountains of west Nevada are briefly discussed to show how the proposed perspective on lithic technology can elucidate temporal change in mobility strategies.(9)

*Kelsay, Richalene G. (San Diego State), Jennifer T. Taschek (Oregon, Eugene) and Joseph W. Ball (San Diego State)*

**INTRASETTLEMENT SPACE-UTILIZATION AND RESIDUAL SOIL PHOSPHATE LEVELS IN THE UPPER BELIZE VALLEY, CENTRAL AMERICA.**

Analysis of residual soil phosphates resulting from the deposition and decomposition of human and animal wastes is an effective means of defining the extent and pattern of prehistoric settlements and intersite land-use. This paper reports on a soil phosphate sampling program to define the limits of several residential loci or houselots within two Classic period settlements in the upper Belize Valley: Buenavista del Cayo, a small urban administrative center, and Guerra, a plazuela-focused residential farming suburb. The sampling procedures and analytical techniques used are described and their results are discussed.(43)

*Kent, Jonathan D. (Metropolitan State, Denver)*

**GROUND FIGURES AND ROADS IN ACARI, PERU.**

Survey during the 1986 field season revealed the existence of hitherto unknown geometric ground figures and pre-Inca roads in the lower Acari Valley of southern coastal Peru. The figures are probably associated with Early Intermediate Period (Early Nasca) occupation in the area. Pre-Inca roads were associated with the Late Intermediate Period to judge from structural remains and sherd scatters adjacent to the roads, and they were reused during Inca times. Interestingly, these roads lead to other valleys of the coast, rather than upstream or downstream, suggesting the importance of inter-valley communication. The association of traditional caravan trails with both roads and ground figures is discussed.(49)

*Kent, Susan (Old Dominion)*

**THE RELATIONSHIP BETWEEN ANTICIPATED MOBILITY STRATEGIES AND SITE STRUCTURE.**

Ethnoarchaeological research provides a vehicle in which to test variables influencing Stone Age archaeological site structure and the general organization of space. The frequency of monofunctional to multipurpose activity areas at a site is analyzed as a function of one or more of three potential factors—mobility strategies (nomadic versus sedentary), economics (hunter-gatherers, farmers, or a mixture of each), and/or ethnicity (modern Basarwa or "Bushmen" versus Bantu-speakers). Anticipated mobility, rather than actual, is deemed most influential in determining site complexity in terms of monofunctional loci. The implications of this study for spatial studies of Old to New Stone Age sites are explored.(44)

*Kent, S.* (27)

*Kenyon, Dienje M.E. (SUNY-Binghamton)*

**DECONSTRUCTED THULE STRUCTURES.**

A deconstruction of McGhee's 1977 article "Ivory for the Sea Woman: the symbolic attributes of a prehistoric technology" was done to expose the weaknesses, as well as the contributions, of a struc-

turalist approach in the interpretation of a specific set of Thule artifactual remains and their possible symbolic significance. Ethnographic accounts and archaeological data, additional to those used by McGhee, were examined to provide diachronic and synchronic depth to McGhee's work. From this study it appears that although a carefully constructed structuralist argument provides neat, appealing explanations, these are not necessarily sufficient. By considering the materials contextually, non-structuralist arguments can provide equally plausible explanations.(60)

*Killick, David J. (Yale)*

**A TECHNOLOGY IN ITS SOCIAL SETTING: HISTORIC IRON SMELTING IN CENTRAL MALAWI, EAST AFRICA.**

The technology and social organization of iron production in central Malawi (extinct since 1930) has been studied through interviews with former ironworkers, archival research, excavation of historic smelting sites and extensive metallurgical investigation. A remarkable variety of furnace designs and operating procedures were recorded. The variety reflects the belief that failed smelting operations were caused by deliberate acts of sorcery by rivals. Fear of sorcery inhibited the exchange of information between peers. Information was transmitted primarily from each master to his apprentices, giving rise to a large number of parallel mini-traditions in the region. (32)

*Killion, Thomas W. (School of American Research, Santa Fe, New Mexico)*

**THE USE OF SPACE AROUND THE RESIDENCE BY THE ANCIENT FARMERS OF THE GULF COAST: RECENT RESEARCH FROM THE SITE OF MATACAPAN, VERACRUZ, MEXICO.**

The investigation of prehistoric agriculture has often focused on outfield production, relict agricultural features, and paleobotanical remains. This paper examines the use of space and its material consequences in residential contexts as an aid to understanding the livelihood patterns of tropical cultivators in ancient Mesoamerica. The nature and form of activity areas within the tropical garden-residence are examined and a model of the use of near residential space is presented. The model forms the basis for the analysis of archaeological data from residential contexts at the site of Matacapan on the Gulf Coast of Veracruz, Mexico.(42)

*Kimball, Larry R. (Northwestern) and Lawrence H. Keeley (Illinois, Chicago)*

**THE DETECTION OF PLANNING IN PALEOLITHIC ASSEMBLAGES.**

The detection of planning in the archaeological record of Paleolithic hunter-gatherers is of concern in certain unresolved problems. First, the evaluation of the cognitive abilities of early hominids and sapiens is crucial to the understanding of the emergence of systematic hunting strategies and mobility systems, which presume a viable ability to anticipate future needs and fit these goals with information of the location, abundance, and periodicity of natural resources. Second, the degree to which early hominids and sapiens could predict future foraging opportunities was probably acted on by selection. Third, an important aspect of interassemblage variation is due to the relative importance of planned versus situational activities. The detection of planning in the Paleolithic record must be accomplished by partitioning assemblage composition by the planning context of activities as well as, whether the activity took place on-site or off-site. A framework for detecting planning in Paleolithic assemblages is outlined. Anticipated and situational activities are distinguished by patterned relationships between procurement, manufacture, and use of tools employing raw material sourcing, reduction method, refitting, and microwear analysis. Several Paleolithic cases are evaluated in this regard.(9)

*King, C. (see Ericson, J.E.)*(40)

*Kintigh, Keith W. (California, Santa Barbara), Susan Gregg (Northern Iowa) and Robert Whallon (Michigan)*

**LINKING ETHNOARCHAEOLOGICAL INTERPRETATION AND ARCHAEOLOGICAL DATA: THE SENSITIVITY OF SPATIAL ANALYSIS METHODS TO POST-DEPOSITIONAL DISTURBANCE.**

K-means and unconstrained clustering analyses of artifact distributions from recently-abandoned Bushman camps indicate patterning that is readily interpretable in the context of Yellen's ethnographic observations. However, because the camps were recorded shortly after abandonment, the distributions analyzed were not subject to the disturbance and destruction that would be seen in archaeological deposits. To examine the sensitivity of our methods to post-depositional processes, the same distributions were reanalyzed after simulated locational disturbance and artifact class-specific decay. The results show that most behaviorally interpretable patterning can be detected by these methods in spite of severe dislocation and decomposition.(44)

*Kirch, Patrick V. (Washington)*

**SOME EXPLORATIONS IN LAPITA ICONOGRAPHY.**

The Lapita Cultural Complex, representing initial incursion of Austronesian speakers into the southwest Pacific, spread rapidly between 1600-1200 B.C., over distances up to 5,000 km. This paper

examines the iconography of Lapita ceramic assemblages, and explores the hypothesis that the highly elaborated early Lapita ceramics played a significant role in long-distance, prestige-good exchange. Iconographic change in ceramics is examined in relation to parallel changes in the distribution of other exotic items. It is suggested that Lapita ceramics encoded important information regarding the relative socio-political positions of local nodes in the larger Lapita exchange network.(55)

*Kleindienst, Maxine R. (Toronto)*

**PLEISTOCENE ARCHAEOLOGY OF THE DAKHLEH OASIS, EGYPT: BACKGROUND TO THE HOLOCENE ADAPTATIONS.**

Recent geoarchaeological research by I. Brooks and M. Kleindienst has established the presence of human habitation at the Dakhleh Oasis and Paleo-oasis, dating from Upper Acheulean (late Middle Pleistocene) through Upper Pleistocene times. The distributions of stone artefact aggregates, and industries, can be related to change in landforms and depositional contexts within the oasis. The regional chronology based upon geomorphology and the analyses of large surface aggregates is compared with evidence from elsewhere in the Western Desert.(14)

*Knapp, Gregory (Texas, Austin)*

**IRRIGATION AND CULTURE HISTORY IN THE EQUATORIAL ANDES.**

Canal networks in dry Andean basins are often comparable in size and complexity to networks in coastal Peruvian valleys. Existing maps of these canals are filled with inaccuracies. Recent research has allowed mapping of canal networks in selected valleys of northern highland Ecuador. Many canals still exhibit rustic construction features characteristic of pre-Hispanic technology. Colonial documentation and archaeological context provide clues for establishing canals' age. The importance of canal irrigation helps explain the political geography of late pre-Inca chiefdoms and the subsequent history of ethnic displacement and replacement.(28)

*Knecht, Philomena and Margaret J. Schoeninger (Harvard)*

**RECONSTRUCTING PREHISTORIC DIET/SUBSISTENCE ON KODIAK ISLAND THROUGH AN ANALYSIS OF STABLE ISOTOPE RATIOS IN BONE COLLAGEN.**

Archaeological applications of stable isotope analysis derive from the fact that the isotope ratios present in an animal's bone collagen reflect the isotopic ratios of its diet. This study compares the ratios of stable nitrogen and carbon isotopes in the bone collagen of prehistoric populations on two sites from the western side of Kodiak Island. The Our Point site in Uyak Bay, where the skeletal sample comprises individuals from both the Kachemak and Koniag phase, and the Karluk-One site at the terminus of the Karluk River: a Koniag site. Although these two sites are separated by a distance of not more than twenty coastal miles, they present different resource profiles. The possibility exists that differences in resource distribution were mitigated by seasonal movements, inter-regional feasting, or trade, and this is discussed in terms of the stable isotope evidence.(7)

*Knecht, Richard (Bryn Mawr)*

**THE KONIAG: ETHNOGENESIS AND DEVELOPMENT OF A RANKED PACIFIC ESKIMO SOCIETY.**

Archaeological work on Kodiak Island, Alaska since 1983 has yielded significant new data which clarifies the formerly sketchy information available on prehistoric Koniag culture, and necessitates a re-interpretation of views on Koniag cultural origins. Excavation of Karluk One, a wet site with exceptional conditions of preservation, revealed a sequence of Koniag houses and more than 5,000 artifacts. The known range of Koniag material culture can now be seen to be primarily an in situ development, rather than the result of influxes of immigrants from the Alaska Peninsula or Cook Inlet.(7)

*Knight, Dean H. (Wilfrid Laurier, Waterloo)*

**MORPHOLOGY OF A 17TH CENTURY HURON VILLAGE.**

Twelve seasons of excavation have uncovered approximately three quarters of the 10 acre Ball Site, an early 17th century Huron village near Orillia, Ontario. All or parts of 56 structures as well as large portions of the surrounding palisade have been exposed. This work has revealed a rather systematic arrangement of structures throughout the village suggesting some type of planned organizational principles were used during village construction. It is suggested that the village was organized around sociopolitical precepts that are physically represented by groups of houses surrounding open areas. The recovery of 13 burials from the site indicates some of the demography of the population as well as information about a little understood burial practice of the Huron.(36)

*Knobloch, Patricia J. (Institute of Andean Studies)*

**THE NASCA LEGACY.**

Iconographic similarities between Phase 8 Nasca style and Middle Horizon Epoch 1 Huari style ceramics indicate that Nasca originated many Huari decorative attributes. Recent research suggests

that by Middle Horizon Epoch 1B, Huari manufactured pottery became the stylistic source which developed a highland pottery that combined the art of Chakipampa and Nasca 9 styles. Chronologically Nasca art of Phase 9 is not used to designate the beginning of the Middle Horizon. Instead style changes in Nasca art of Phase 8 document the beginning of the Middle Horizon. The stylistic control of Middle Horizon Epoch 1 iconography is dramatically evident in the numerous creature depictions of Huari's early cosmology.(13)

*Knoel, John (National Park Service, Washington)*

**MANAGING HISTORIC PRESERVATION INFORMATION.**

This paper explores the silent crisis in historic preservation — the management of information. In the past, the Park Service encouraged preservation planners to make use of existing information before acquiring new data. Unfortunately, gaining access to existing information is one of the most difficult tasks in planning. Without a computer environment, planning bogs down to the tedious task of manually manipulating data, placing limits on analysis and shortening the range of planning options. Two DBMS's, spatial and non-spatial, provide planners with a computer environment that turns the crisis of information management into a powerful tool for expanding planning abilities.(54)

*Knudson, R. (31)*

*Kobayashi, M. (see Longacre, W.)50)*

*Koetje, Todd A. (Tennessee, Knoxville)*

**PAVEMENT FEATURES FROM THE EUROPEAN UPPER PALAEOLITHIC.**

Although scanty, published information can be used to obtain a clearer picture of the use of pavements during the Magdalenian and Badegoulian in Europe. Published accounts of excavated pavements suggest geographical confinement to three main areas: Northern Pyrenees, Northern Dordogne, and Southern Germany. Rough contemporaneity cannot be clearly demonstrated either between or among the sites with pavement features in these areas. Examples of pavements exist from cave, rockshelter and open air sites, with a slight correlation between their occurrence and generally warm, moist climatic regimes. Patterns in the orientation of some pavements are also suggested.(16)

*Kolata, Alan L. (Illinois, Chicago)*

**PROYECTO WILA JAWIRA: AN INTRODUCTION TO GOALS, METHODS, AND RESULTS.**

Despite the state of Tiwanaku's fundamental position in the cultural history of the Andes, little is known about its economic history, and virtually nothing concerning its important agrarian heritage. The Proyecto Wila Jawira was organized to redress this imbalance through an integrated multidisciplinary research program centered in the near hinterland of the city of Tiwanaku. The ongoing research is framed around three interrelated components: (1) analysis of preserved fossil field systems, (2) analysis of the paleoenvironmental contexts of agricultural reclamation, and (3) analysis of the Tiwanaku zonal settlement system. The presentation covers the project's antecedents, and an overview of goals, methods, and current results.(52)

*Kolb, Charles C. (Mercyhurst)*

**CLASSIC TEOTIHUACAN "COPOID WARES" - CERAMIC TECHNOLOGICAL AND CULTURAL INTERPRETATIONS.**

"Copoid Wares" ('pilsner-glass' copas and small thin-walled vase forms) dating to the later Classic Teotihuacan phases (ca. 300 - 750 A.D.) have been reported by Seler (1915), Gamio (1922), Linne (1934, 1942), Sejourne (1963), Kolb (1965) and Miller (1966), among others. Considered a unique "elite" ceramic, the ware has never been adequately described in the literature, but was related to Teotihuacan "Polished Wares" and possibly the florero and Tlaloc effigy traditions. Ceramic technological studies and cultural contexts are detailed, and uses in mortuary and ceremonial practices are demonstrated.(30)

*Kornbacher, Kim D. (British Columbia)*

**LITHIC TECHNOLOGY AND DURATION OF OCCUPATION OF A SOUTHERN NORTHWEST COAST SHELL MIDDEN.**

Ethnographic accounts of the southern Northwest Coast's Gulf Islands report seasonal patterns of resource exploitation involving short-term use of island sites for extraction and processing of important, storable resources. Archaeological evidence suggests this pattern may not accurately describe the prehistoric occupation of the Garrison Bay site on San Juan Island, Washington. Lithics from the site have been analyzed to test the hypothesis that Garrison Bay functioned as a residential base used for a wide range of procurement and non-procurement activities. The specific variables chosen for analysis, examining both tool use and stage of manufacture, are discussed. (56)

*Kowalewski, Stephen A. (Georgia)*

**THE PRODUCTION OF CULTURAL DIVERSITY.**

Contrary to a widespread opinion, neither geographic isolation, topographic recalcitrance, nor an autonomous linguistic clock produced cultural diversity in the State of Oaxaca, Mexico. Evidence from linguistics, archaeology, history, and ethnography contradicts these suggested explanations, and points instead to several distinct social processes: 1) formation of initial ranked and territorial societies, 2) Balkanization of oft-contested corridors, and 3) marginalization in primate systems. These processes are cross-culturally common, potentially generalizable, and significant for theories of diversification.(5)

*Kozłowski, Janusz K. (Jagellonian, Krakow, Poland)*

**NORTHERN CENTRAL EUROPE AT CA. 18,000 B.P.**

This paper documents the environmental changes in North Central Europe between 25,000 and 15,000 B.P. It then examines population shifts and cultural developments in specific regions. The eastern zone shows more stable settlement with periodic oscillations of population shifts between upper Dneestr and Volhynia. With the exception of several regions of favourable microclimates in western Slovakia, important Gravettian centers disappear from the western zone after 22,000-21,000 B.P. The main part of the Gravettian population from the western zone shifts to the south, making way for the origin of Epigravettian in the middle Danube and the Balkans and later to the east, contributing to the origin of Kostenkian tradition on the Russian Plain. The divergence of ecological conditions between the western and eastern zones during the Second Pleniglacial can explain the main differences in cultural evolution.(20)

*Kra, Renee (Yale)*

**SOLVING YOUR DATING PROBLEMS WITH THE NEW RADIOCARBON DATA BASE PROJECT.**

Radiocarbon dates are essential to the understanding of chronological frameworks in every archaeological investigation. Revolutionary advances in dating techniques and dendro-chronological calibrations juxtaposed with antiquated methods of reporting radiocarbon data have generated imbalances in managing and utilizing radiocarbon data. A universal computerized Radiocarbon Data Base has been implemented to update, store, and maintain a centralized, standardized, and comprehensive record of radiocarbon dates which will be easily accessible to researchers. A high-level format for data entry has been designed. Data disks will be uploaded to the mainframe at the Yale Computer Center from which data may be retrieved and disseminated.(33)

*Kroll, Ellen M. (Wisconsin, Madison)*

**HELP, NO HEARHTHS: INTERPRETING PLIO- PLEISTOCENE INTRASITE SPATIAL PATTERNS.**

Ethnoarchaeological observations of the camps of contemporary hunter-gatherers are demonstrating that hearths are a social focus for nuclear families, a physical focus for the location of activities, and a magnet-like focus for small-size refuse discarded from a variety of activities. For upper paleolithic sites in which hearths are found surrounded by concentrations of refuse, archaeologists frequently rely on the aforementioned observations as a means to interpret how prehistoric hominids structured their use of space and organized their activities. Many of the Plio-Pleistocene archaeological sites from East Africa, however, despite the absence of hearths, have distinct intrasite spatial patterns; this paper will examine those patterns and the range of interpretive options in the absence of hearths or direct evidence of other habitational structures.(44)

*Kroll, E.M. (see Bartram, L.E.)(44)*

*Kuhn, Steven (New Mexico)*

**RESHARPENING, RE-USE AND SITE RE-OCCUPATION IN THE CENTRAL ITALIAN MOUSTERIAN.**

The concept of curation, in the strategic sense, is central to the investigation of the changing adaptive role of technology over the course of human evolution. Many of the analytical criteria presently used to support inferences about curation within technological systems are ambiguous, and do not allow the analyst to distinguish the effects of planned maintenance of tools from those of other behavioral processes. This paper presents results from an ongoing study of assemblages from Moustertian strata in Central Italy, in which data from faunal assemblages are employed in concert with several types of lithic morphotechnological evidence, in order to reduce analytical ambiguities.(9)

*Kujundzic, Zilka (Zemaljski Muzej, Sarajevo) and Robert Whallon (Michigan)*

**PALAEOLITHIC-MESOLITHIC INVESTIGATIONS IN SOUTH BOSNIA-HERCEGOVINA.**

In 1986 a joint project was begun by the Zemaljski Muzej in Sarajevo and the University of Michigan Museum of Anthropology, the long-term aim of which is investigation of Palaeolithic-Mesolithic

occupation in the Adriatic-Mediterranean zone of Bosnia-Herzegovina. Regional survey results so far will be discussed briefly, followed by a presentation of the 1986 excavations at Badanj, the first known site of Palaeolithic-Mesolithic age in the area. These excavations have recovered materials from both Mesolithic and Epi-palaeolithic periods.(16)

*Kutschera, W. (see Taylor, R.E.)(23)*

*Kuznar, Lawrence A. (Northwestern)*

**ASANA: A DEEPLY STRATIFIED, OPEN-AIR ARCHAIC PERIOD SITE IN THE SOUTH CENTRAL ANDEAN HIGHLANDS.**

Northwestern University Archaic Project tested Asana, a large, open-air stratified Archaic period deposit located in a major stream valley in the high sierra zone of southern Peru. The site, at an elevation of 3450 m, is unique because Archaic stream bottom sites are rarely preserved in this highly erosional environment. At least 14 occupational levels were found. The site's deep stratigraphy (3 m) and excellent organic preservation are described. Due to the site's well preserved stratigraphy and organic material, it promises to yield important information regarding Archaic mobility patterns, the development of sedentism, and the domestication of camelids in the South Central Andes.(49)

*Kvamme, K. (see Longacre, W.)(50)*

*Lang, Neil A.R. (Durham, England)*

**MORTUARY ANALYSIS, ITS USES AND ABUSES: SOME EXAMPLES FROM THE IRON AGE OF NORTH WEST EUROPE.**

In British archaeology, initial interest in the possibilities of reconstructing social behaviour from symbolism employed in mortuary ritual has been restricted by criticisms, drawn largely from ethnographic research. While some of the earlier viewpoints taken by the "New Archaeology" may now seem extreme, the attempts to produce a more rigorous approach to the study of mortuary analysis can be seen as an important step forward. Despite this, a truly cohesive approach to the archaeology of death has rarely been achieved on either side of the Atlantic. Using examples from the North West European Iron Age, this paper will consider some of the premises from which social and demographic inferences have been drawn, and will set out a framework through which such a cohesive methodology can be approached.(32)

*Larralde, Signa (New Mexico)*

**PLANNING STONE TOOL MANUFACTURE AND USE IN THE GREEN RIVER BASIN: THE EFFECT OF DISCRETE RAW MATERIAL ATTRIBUTES ON ARTIFACT DISTRIBUTIONS.**

The planning of stone tool manufacture and use is likely to be conditioned by raw material availability, and such raw material attributes as morphology and density. In Wyoming's Green River Basin, quartzites and cherts are the two major raw materials, and they tend to occur as spatially discrete secondary sources. Implications of differential tool planning are examined by comparing two spatial data sets: small and large scale maps of the distributions and attributes of these two raw material types, and small scale maps of stone tool and debitage distributions.(9)

*Larson, M.L. (California, Santa Barbara)*

**CHIPPED STONE DEBITAGE AND THE ORGANIZATION OF TECHNOLOGY.**

The relationship between debitage, technological organization and cultural behavior is imperfectly understood, even though debitage is one of the most ubiquitous remains in prehistoric hunter-gatherer archaeological sites. This paper identifies some of the variables of technological organization that affect the chipped stone manufacturing debris in the archaeological record. It is argued that debitage studies can provide information about the technological system not otherwise available from assemblage level analyses. The inferred relationships of technology and debitage are then applied to the analysis of material from an Early Plains Archaic site in northcentral Wyoming.(9)

*Latta, Martha A. (Toronto)*

**AN HISTORICAL OVERVIEW OF ONTARIO PREHISTORY.**

This paper surveys the past century of archaeological research in Ontario, focusing specifically on issues which appear to be unique to Canadian archaeology or at least to differ from common practices in the United States. Examples of these issues are (A) the close interaction between historical and prehistoric archaeology in Canada, (B) the supportive work of the amateur community, and (C) the importance of ethnographic analogy in prehistoric interpretation. This difference cannot be attributed to British or other European influences to any great extent. Rather, it reflects the events which shaped Ontario archaeological thought and, through the universities which disseminated this theoretical orientation, shaped the whole of Canadian archaeology today.(33)

*Lavin, Lucianne (New York/Yale Peabody Museum)*  
**PREHISTORIC PROCUREMENT OF SECONDARY LITHIC SOURCES: THE CASE FOR CHARACTERIZATION.**

Geochemical identification of lithic sources is a new and exciting subfield of archaeology. Most characterization studies have concentrated on quarry areas within primary rock outcrops. An important but underrated resource is secondary or redeposited materials such as till and fluvial deposits. This paper discusses the characterization of secondary chert sources by petrographic or thin-section analysis and assesses the technique's utility in identifying specific secondary formations as the raw material source for prehistoric artifacts. Data from sites in the Delaware and lower Hudson drainages of New Jersey and New York confirm the need for further analysis of non-quarry chert source localities.(31)

*Lazenby, M.E. Colleen (Bryn Mawr)*  
**THE OCEAN BAY PERIOD OF OCCUPATION ON KODIAK ISLAND, ALASKA.**

This paper will present a current summary of data relating to the Ocean Bay period of occupation on Kodiak island between ca. 6500-4000 B.P. Included will be Nowak's 1977-1978 excavations at KOD-224 and the Kodiak Archaeological Project's excavations and surveys from 1983 to 1986. Of particular interest are data pertaining to Ocean Bay I and II house forms and the origins of slate grinding on Kodiak. This new information complements Donald Clark's discussion (1979) of the earliest known culture on the island.(7)

*Lebo, Cathy J. (Indiana)*  
**NATURAL FORCES AND HUMAN AGENCY—PARTITIONING VARIATION IN A LITHIC INDUSTRY.**

Lithic industries manufactured from naturally modified stone blur the boundary between natural and cultural modification. Both nature and man shape stone into forms, but variation in form reflects the application of distinct forces. Natural variation can be distinguished from cultural by a) predicting changes in raw material due to natural forces, b) predicting changes produced by human agency, and c) translating these predictions into measurable changes in lithic attributes. Analysis of a late Pleistocene chopper-scraper industry from the Itaboraí site, state of Rio de Janeiro, Brazil, illustrates this method.(56)

*Lensink, Stephen C. (Iowa, Iowa City)*  
**RESOURCE INDUCED MIGRATION IN CENTRAL NORTH AMERICA: THE CASE OF THE SOGGY MARSH.**

Research in two different landform regions of North America provides data for a locational model of mobile foragers during the Holocene. Projectile point data are used to construct utilization curves for two areas covering 10,000 years of prehistory. These curves argue that hunter-gatherers abandoned prairie marshes of the Wisconsin landform during cool, moist conditions when marshes would have been unproductive. During these conditions, foragers migrated to better drained habitats where big game populations would have been increasing. A least cost strategy is proposed to account for the movements.(12)

*Leonard, Robert D. and Roger Anyon (Zuni Archaeology Program)*  
**COMPARABLE SAMPLING OF VARIED LANDFORMS IN THE REGIONAL SURVEY.**

Regional archaeological surveys encompass areas characterized by diverse landforms and vegetation associations: factors which influence site visibility. Yet, survey procedures are remarkably static, and rarely take into account differences encountered in vegetation or terrain. As such, significant biases exist on these surveys, as the chance of encountering sites varies from locale to locale, while survey techniques are held constant across the region. These biases can be consequential, particularly as regards their effects on reconstructing settlement patterns or prehistoric land use. Examples where these biases may be seen are presented, and procedures are discussed which allow these biases to be minimized.(34)

*Leone, M.P.* (29)

*Leone, M.P.* (60)

*Leventhal, Richard M. (SUNY-Albany)*  
**SOUTHERN BELIZE: THE DEVELOPMENT OF A MAYA REGION.**

The concept of regions in the Maya lowlands has often been discussed but has only rarely been examined and tested with a specific data base. Recent archaeological research in southern Belize provides a strong data set from which (1) to define the southern Belize region, both geographically and culturally, and (2) to create a model of the occupation and development of cities within the region.

The first occupation within southern Belize appears to have occurred in the western part of the region at the sites of Pusiha and Uxbenka. This model will attempt to explain the development of these and other cities within the region. Even as the population of southern Belize focused upon numerous centers, this region remained internally cohesive as one of many functioning regions throughout the Maya lowlands.(45)

*Levy, Janet E. (North Carolina, Charlotte)*  
**DANISH METALLURGY IN THE BRONZE AGE.**

The non-egalitarian social organization of European Bronze Age societies has been analyzed by several scholars, with research often based on distributions of metal objects in graves and hoards. Chronological, typological, and distributional analyses of these bronzes date to the 19th century. Much remains to be said, however, about the techniques and organization that produced the bronzes. Metallographic analysis of several bronze artifacts from Denmark is the foundation of a study of the technological organization of Bronze Age metallurgy in this significant area of Europe. The role of metallurgy in the non-egalitarian social organization is discussed.(16)

*Lewis, R.B. (see Sussenbach, T.)*(10)

*Lewis-Williams, David (Witwatersrand)*  
**THE SIGNS OF ALL TIMES: ENTOPIC PHENOMENA IN ROCK ART.**

Research in southern Africa suggests that entopic phenomena play a role in San rock art. Because these phenomena are human universals it has been possible to formulate categories of the phenomena and principles governing their apprehension and depiction by rock artists. The paper deals with entopic phenomena in the rock art of southern Africa, the European paleolithic, and the Coso Range of North America.(38)

*Leyden, B. (see Binford, M.W.)*(52)

*Lindly, John (Arizona State)*  
**AN ANALYSIS OF LITHIC REDUCTION SEQUENCES AND TECHNOLOGY AT THE UPPER PALEOLITHIC SITE 623, WEST-CENTRAL JORDAN.**

The refitting of archaeological lithic assemblages can allow archaeologists to examine prehistoric reduction sequences in detail. Site 623 in west-central Jordan is a discrete Upper Paleolithic knapping location which provides an almost unique opportunity for the reconstruction, description, and analysis of reduction technologies. The results of this analysis are compared to similar data from the Middle/Upper Paleolithic transitional site of Boker Tachtit, in the central Negev, to examine similarities and differences in lithic reduction sequences during the Paleolithic of the Levant.(56)

*Linick, T.W. (see Long, A.)*(23)

*Lippi, Ronald D. (Museo del Banco Central del Ecuador, Quito, and Ripon College)*  
**THE WESTERN PICHINCHA PROJECT: SURVEY AND EXCAVATIONS IN EQUADOR'S WESTERN MONTAÑA.**

The results of a preliminary archaeological exploration of 6,000 km<sup>2</sup> of rugged, sparsely populated terrain between the crest of the Cordillera Occidental and the coastal lowlands west of Quito are presented. Substantial new data from the 1985-early 1986 field season, including coring and excavation of a multi-component montaña site, permit the construction of a rough chronological scale from 1500 B.C. to A.D. 1600. Additional discussions include the prehistoric road system and highland-montaña exchange, the identification of "lost" proto-historic Yumbo settlements, and the possible cladistic affiliations of the Yumbo and Nigua Indians.(28)

*Little, Barbara J. (SUNY, Buffalo)*  
**THE AUTHORITIES OF MEDIA: PRINT CULTURE AND MATERIAL CULTURE IN THE COLONY AND STATE OF MARYLAND.**

The consumption and production of information and its uses in social and political discourse are examined in this study of a family of printers in Annapolis, Maryland. It is assumed that material culture, including printed matter, both reflects and influences cognition and social behavior. Not all forms of oral, non-verbal, written, printed, and material media possess similar degrees of authority, however. It is a challenge to determine varying degrees of authority recognized historically and today in various forms of communication prevalent in the eighteenth century. Such a ranking of media influence should contribute to an understanding of the meanings of all varieties of material culture.(79)

*Loendorf, Larry (North Dakota)*  
**TOPOPHILIA AND ROCK ART IN THE NORTHWEST PLAINS.**

One variety of rock art found in the Northwest Plains of North America includes fine incised petroglyphs that depict scenes of horses and their trappings with riders who carry guns and coup



sticks. These scenes are similar to those on hides or those in ledger books that show the war deeds of Plains Indian warriors. Another distinct variety of rock art contains therianthrope figures and other shamanic images. The geographical settings of these two kinds of art are quite different. The incised petroglyphs showing war deeds are often on large prominent cliff faces adjacent to major stream valleys and travel routes or found associated with campsites. Shamanic art is often found in caves or secluded locations with difficult access. This difference in the geographical settings of the types of art lends credibility to our interpretation of its function. On a more refined level it appears that the position of a site and its surroundings influence the content of the art.(38)

**Long, Austin, A.T. Wilson, B.H. Gore, D.J. Donahue, A.J.T. Jull and T.W. Linick (Arizona, Tucson)**  
**BONE DATING AT THE ARIZONA TANDEM ACCELERATOR MASS SPECTROMETER FACILITY.**

The fundamental problem with <sup>14</sup>C dating of bones is that the longer they have remained buried, and the harsher the burial environment, the more degraded the collagen becomes, and the greater the likelihood of more recent carbon contamination in the bone. Often it is the older, more difficult to date specimens that are also the rarer and more interesting archaeologically. If no structural collagen is recognizable in a bone, it may yet contain polypeptide fragments in sufficient abundance for AMS <sup>14</sup>C analysis. In order for the <sup>14</sup>C dating result to be convincing, at least two size fractions must yield concordant dates. Application of this approach to specimens of "known" age has yielded encouraging results. We will also illustrate results of total amino acid AMS <sup>14</sup>C analysis of bone specimens, and suggest standardizing of bone date reporting.(23)

**Longacre, W., K. Kvamme, and M. Kobayashi (Arizona)**  
**POTTERY STANDARDIZATION: ETHNOARCHAEOLOGICAL STUDIES FROM THE PHILIPPINES.**

Archaeologists assume that products of specialists will be standardized and that standardized pottery reveals the presence of full-time potters. To test this, two populations of contemporary Philippine cooking pots are studied: those made on a household basis by the Kalinga, a "tribal" society, and from Paradijon, a neighborhood of full-time potters. The data indicate that pots from Paradijon are much more standardized than those from Kalinga. Pots from the Grasshopper site (Arizona) also are examined and the data suggest that their degree of standardization is most similar to the Kalinga sample, strengthening the inference of prehistoric household production there.(50)

**Lothrop, Jonathan C. (SUNY-Binghamton)**  
**PALEO-INDIAN LITHIC RAW MATERIAL MANAGEMENT IN THE NORTHEAST.**

The spatial incongruity between many Northeastern Paleo-Indian sites and the lithic sources from which their assemblages were derived is well-documented. However, disagreement exists over how Paleo-Indians coped with these disparities and how, in turn, their strategies are reflected by lithic assemblages at Paleo-Indian sites. In this paper, different models of how Paleo-Indians managed their lithic raw materials away from source locations are reviewed and evaluated, based on reference to excavated assemblages from select Northeastern Paleo-Indian sites.(46)

**Luedtke, Barbara E. (Massachusetts, Boston)**  
**CHERT SOURCE DETERMINATION: GETTING DOWN TO BASICS.**

There are now a variety of methods for determining the geologic sources of chert artifacts, each of which appears to work very well in some cases and not so well in others. The time is ripe for a comprehensive approach that synthesizes many of these methods to allow archaeologists to determine the sources of archaeological artifacts as simply, cheaply, and accurately as possible. The structure of such an approach is described and illustrated, using data from a number of Midwest chert sources.(31)

**Lundy, Doris (British Columbia Provincial Museum)**  
**THE ROCK ART OF BRITISH COLUMBIA: A CHRONOLOGICAL REVIEW.**

There are at present few accurate, reliable dating techniques available to researchers of rock carving and rock painting in Canada's western province. Stylistic analysis, ethnographic information, design content and other somewhat subjective clues are used to suggest chronologies. This paper will examine these techniques and their results, plus look at one instance of radiocarbon dating of a coastal petroglyph, while also suggesting other possible methods for establishing chronologies.(35)

**Lyman, R. Lee (Missouri-Columbia)**  
**APPLIED ZOOARCHAEOLOGY.**

Wildlife management decisions are often based on historic data that may be biased by effects of industrialization. Recent attempts to establish new populations of sea otters on the eastern Pacific Rim and debates over management choices regarding descendant herds of historically transplanted

mountain goats in western Washington state illustrate that zooarchaeology can provide wildlife managers with unique data of critical importance to management decisions.(25)

**Lynch, Thomas F. (Cornell)**  
**SEARCHING FOR THE INKAS AT CATARPE TAMBO AND RELATED SITES IN THE CHILEAN ATACAMA.**

In the Chilean Atacama zone, Provincial Inka sites may have several functions but are often associated with a system of roads and trails. A brief examination of four supposed tambos (Catarpe, Peine, Guanaqueros and Rio Frio) shows as many differences as similarities in architecture, while ceramics, wooden artifacts and spatial orientations continue to provide more promise for the identification of the Inka imprint. Building techniques and materials vary considerably and may relate to functional differences as well as maintenance of local habits and preferences.(41)

**Lynch, T.E. (6)**

**Lynch, T.E. (52)**

**MacKinnon, J. Jefferson (Wisconsin, Madison)**  
**COASTAL MAYA TRADE ROUTES IN SOUTHERN BELIZE.**

Four years of research on the coast and cays of the Stann Creek and Toledo Districts of Belize provides evidence that changes in settlement patterns reflect significant differences in the nature, routing, and termini of maritime trade in the Classic, Early Postclassic, and Late Postclassic. Local and short distance canoe trade which hugged the coast and moved in relative security may have predominated in the Classic. As long distance maritime trade developed in the Early Postclassic, it still moved near the coast. Late Postclassic trade moved along the outer reef cays to Nito and Naco.(47)

**MacNeish, Richard S. (Andover Foundation for Archaeological Research)**  
**EARLY MAN FINDS FROM MIZQUE, BOLIVIA.**

In July, 1986 the author visited Donald Brockington's Mayra site in Mizque, just south of Cochabamba, Bolivia. Previous excavations in the last season had revealed "pre-ceramic" remains underneath more than a meter of Formative floors. The July reconnaissance indicated that the pre-ceramic materials at six loci came from two superimposed strata. Further, bones of extinct horse at two loci were associated with tools made on flakes from quartzite pebbles in the upper dark strata. The lower brown strata at two loci yielded quartzite pebble tools, not unlike those from Pedra Furada Cave, Brazil, that may be as early as 33,000 years ago. The implications of these finds and future plans will be discussed.(19)

**Madsen, J. (see Fish, S.K.)(24)**

**Malpass, Michael A. (St. Lawrence)**  
**INKA OCCUPATION OF THE COLCA VALLEY, PERU.**

The Colca valley of southern Peru was known as an Inka breadbasket, yet preliminary investigations failed to identify a significant Inka occupation there. However, recent research on terrace and irrigation systems indicate a marked Inka presence, and nascent architectural studies suggest distinct Inka and pre-Inka variations exist in both building design and settlement patterns as well. Ceramic studies suggest that the initial confusion was due to the apparent melding of Inka and local ceramic traditions, with few "pure" Inka wares present. Such a melding should be looked for in other areas of purported minimal Inka influence.(41)

**Mandel, Rolfe (Kansas), Alan Simmons (Desert Research Institute) and William Farrand (Michigan)**

**PRELIMINARY OBSERVATIONS ON THE GEOMORPHOLOGY OF 'AIN GHAZAL, JORDAN.**

'Ain Ghazal is a major Neolithic settlement located near Amman, Jordan. Unlike many Neolithic sites, it is situated in a relatively favorable environmental setting and this undoubtedly influenced the economic parameters of its inhabitants. Four excavation seasons have been completed, and some preliminary geomorphic data have been gathered. This report summarizes these data, and discusses how geomorphic factors may have affected Neolithic use of the area. Included in the discussion are considerations of site formation processes and environmental variables related to Neolithic adaptations.(3)

**Manhire, A.M. (see Yates, R.J.)(38)**

**Markman, Charles W. (Northern Illinois)**  
**PUTNEY LANDING (11HE3): THE MIDDLE TO LATE WOODLAND ADAPTIVE TRANSITION IN NORTHWEST ILLINOIS.**

Putney Landing is located on the Mississippi River about 60 miles downstream from Rock Island, Illinois and consists of a high-density Havana-Hopewell village and mound complex with a significant

assemblage of exotic raw materials. Extensive areas of dense midden were encountered in the 1986 excavations along with 70 features, two of which are Late Woodland intrusions. A comparative analysis of Middle Woodland feature contents with Late Woodland features provides data regarding the transition to a Late Woodland subsistence regime.(12)

**Marks, Anthony E. (SMU) and C. Reid Ferring (North Texas State, Denton)**  
**THE EARLY UPPER PALEOLITHIC OF THE LEVANT.**

Unlike Western Europe, it is not necessarily simple to draw a line between the Middle and the Upper Paleolithic because there was an actual developmental transition between the two. Thus, any division is somewhat arbitrary. This paper will examine traditional views and more recent perceptions of both the question of the technological and typological definition of the Upper Paleolithic, *sensu lato*, and of the specific manifestations found in the Levant. Both data from the Lebanon and from Israel will be considered, including questions of stone tool production, curation, and settlement systems. The Levantine case is particularly important because the Upper Paleolithic there develops prior to 40,000 B.P.(4)

**Marshall, Sandra L. (New Mexico)**  
**PREHISTORIC AGRICULTURE AND HISTORIC PASTORALISM IN THE MIDDLE RIO GRANDE VALLEY: A VIEW FROM THE COONEY SITE.**

The Cooney Site is a multi-component four-room structure in the foothills of the Sandia Mountains, northeast of Albuquerque, New Mexico. Historic-period shepherds modified and inhabited the ruins of a Rio Grande Classic agricultural fieldhouse. The Cooney Site is the first site excavated that represents either type of activity in the area. It provides evidence for a discussion of regional settlement, and dry-land agriculture and pastoralism in the Middle Rio Grande Valley.(26)

**Martindale, J.L. (see Halsey, J.R.)**(2)

**Mason, Robert B. (Royal Ontario Museum)**  
**PETROGRAPHIC ANALYSIS OF POTTERY FROM R.O.M. FIELDWORK IN THE NEAR EAST.**

Pottery from fieldwork in North Yemen, Sudan, and Iran has been examined in thin-section in order to obtain information pertinent to technological and economic development of the study areas. Examination of the texture and microstructure of the pottery can provide evidence of manufacturing and decorative technique, including method of construction and the application of slips, paints and glazes. Mineralogical determination of included grains and rock fragments can lead to the characterization of fabric types, and by attributing these fabrics to production centres, evidence of trade and industrial development is obtained.(50)

**Masucci, Maria A. (SMU)**  
**INLAND-COASTAL INTERACTION: EVIDENCE OF GUANGALA PHASE INLAND SUBSISTENCE PATTERNS FROM EL AZUCAR, ECUADOR.**

Evidence from excavations 25 km inland near El Azucar, Guayas Province, indicates that coastal resources played an important role in Guangala Phase inland subsistence patterns. Recent excavations throughout southern Ecuador have revealed similar evidence which suggests that intensive exchange systems involving coastal and inland dwellers may have been a key adaptive strategy to the semi-arid environment throughout Ecuadorian prehistory. Data from El Azucar is used to discuss subsistence patterns and the evidence for exchange between inland and coastal areas during the Guangala Phase. Emphasis is placed on the consideration of material correlates of exchange for archaeologically demonstrating trade and interaction.(28)

**Matsui, K.M. (see Wilson Yang, K.M.)**(43)

**Mauldin, Raymond (New Mexico, Albuquerque)**  
**AN ETHNOGRAPHIC OVERVIEW OF HUNTER-GATHERER SUBSISTENCE.**

Using refined measures of environmental productivity, this paper considers hunter-gatherer subsistence as a function of food availability. Employing a cross-cultural sample of cases, the percent of the diet derived from gathering is shown to be highly correlated with effective temperature, a measure of the amount and intensity of solar radiation. Patterns in hunting and fishing dependence are then explored. The study concludes by assessing changes in subsistence practices, including the shift to agriculture, in light of this strong ethnographic patterning. (12)

**Maxwell, Timothy D. and Kurt E. Anschuetz (Museum of New Mexico, Laboratory of Anthropology, Santa Fe)**  
**VARIABILITY IN GARDEN PLOT LOCATIONS IN THE LOWER RIO CHAMA VALLEY, NEW MEXICO.**

Investigation of early Pueblo IV (A.D. 1325-1450) agricultural complexes in the lower Rio Chama has identified a variety of rock-bordered and cobble-mulched features that suggest labor intensive and

specialized farming practices. The structure of some of these plots resembles ethnographically documented dooryard gardens, and although garden features are found in association with pueblo ruins, most occur on scattered terrace remnants that overlook the Rio Chama floodplain. The purpose of this paper is to contrast the ethnographic use of dooryard gardens with the role these plots played within a prehistoric agricultural system that required planting in diverse settings.(42)

**Maxwell, T.D. (see Anschuetz, K.E.)**(26)

**Mayer-Oakes, William J. and Alice W. Portnoy (Texas Tech)**  
**A STUDY OF THE EARLY MAN LITHIC ASSEMBLAGE FROM SAN JOSE, ECUADOR.**

The San Jose, Ecuador, Early Man site can be characterized as a long occupied, general workshop area where stone tools were manufactured and probably also used to process other materials, such as bone and wood, which were not preserved. The large lithic assemblage was based on abundant high quality obsidian, with unifacial working almost exclusively. This developmental blade industry produced some distinctive specialized tools, many utilized "expediency tools" and much unutilized waste. Results of the intensive laboratory study of this assemblage, including a seemingly new tool type, are discussed.(19)

**McAnany, Donna M. (O.M.D. Inc.)**  
**GARBAGE AND GARDENS: THE DYNAMICS OF STONE TOOL DISCARD NEAR RESIDENCES.**

The process of agricultural intensification produces changes in the use of the landscape—where things are done and how they are done. The agricultural labor force, organized at the level of the household domestic unit, is often restructured to meet these new labor demands. The utilization and ultimate discard of agricultural tools is a material consequence of these agricultural dynamics. Lithic data from the agriculturally intensive (Pre-Hispanic) Maya settlement of Pulltrouser Swamp are examined in light of several propositions regarding the relationship between tool use, maintenance, and discard and the location and intensity of agricultural activities.(42)

**McAnany, Patricia A. (Cincinnati)**  
**FROM FAMILY HEIRLOOM TO METATE PECKER: THE CONTEXT OF BIFACE RECYCLING WITHIN AN ENTRENCHED EXCHANGE SYSTEM.**

Stone tool use and recycling are conditioned by the means of raw material acquisition. In mobile societies, groups may map onto resources and lithic procurement can be expected to be embedded in the seasonal procurement of food resources. Tool recycling is likely to be situational and dependent upon temporal and spatial removal from zones of lithic availability.

Among sedentary agriculturalists recycling may be conditioned not by the environmental structure of the resource habitat but by social and economic links between stone tool producers and consumers. The institutionalization of exchange networks polarizes the lithic reduction sequence into (1) a component of production with expedient use of debitage from early stage reduction, and (2) a component of use with recycling of tool fragments.

Lithic data from an ancient Maya settlement zone in northern Belize are used to illustrate the relationship between raw material acquisition and tool recycling.(9)

**McAnany, P.A. (see Shafer, H.J.)**(40)

**McAuley, Tamara Koteles (UCLA)**  
**LOW ART IN HIGH CULTURE: A REANALYSIS OF THE TIKAL "GRAFFITI".**

The incised wall art at the important Maya site of Tikal, Guatemala, has been dismissed as Postclassic "graffiti", resulting from defacement/desecration associated with site abandonment. Although these incisions do not display overt stylistic similarities to more formal Maya art, they comprise a rich iconographic inventory, with a limited range of depicted motifs and themes. In addition, they have recently been discovered in a number of sealed Classic contexts. Reconsideration of this corpus, using formal iconographic and ethnography of communication-based analyses, suggests that it is the result of ritual activities conducted in the building in which it is found and that it represents a previously unrecognized record of Classic Maya ritual.(38)

**McBrearty, Sally (Yale)**  
**THE SANGOAN AND MIDDLE STONE AGE OF WESTERN KENYA.**

Both continuity and innovation in stone artifact design are demonstrated between Sangoan-Lupemban and Middle Stone Age occurrences at the stratified site of Muguruk, in western Kenya. Techniques of flake production remain unchanged throughout the sequence, but formal tool manufacture is radically different in the Sangoan-Lupemban from that in the succeeding MSA. Climatic models of

the Sangoan as a forest adaptation, in contrast with the MSA as a Savanna industry, are not adequate to explain this difference, because fauna from the newly discovered Sangoan site of Simbi include large herbivores who are known to be grassland dwelling forms.(56)

*McCartney, Allen P. (Arkansas, Fayetteville), Jean S. Aigner (Alaska, Fairbanks), Douglas W. Veltre (Anchorage Community), Nancy G. McCartney (Arkansas, Fayetteville) and Lydia T. Black (Alaska, Fairbanks)*

**SETTLEMENT PATTERNS OF UNALASKA ISLAND, EASTERN ALEUTIANS, ALASKA.**

Coastal surveys conducted between 1984-1986 around Unalaska Island provide recent site, topographic, and biological data for the description of prehistoric and early historic settlement patterns. The dozen early historic sites known, briefly described by such Russian chroniclers as Sarychev (1790s) and Veniaminof (1820s) and characterized by multiple family longhouses, are all located on the Bering Sea shore and are coincident with prehistoric sites. Major prehistoric middens are found adjacent to protected embayments, while smaller camp sites are usually found at stream mouths. Site location is heavily influenced by shore elevation and exposure and protection from tsunamis.(7)

*McCartney, A.P. (see Aigner, J.S.)(7)*

*McCartney, Peter H. (Calgary)*

**DELAYED RETURN STRATEGIES AND HUNTER GATHERER SETTLEMENT.**

Food storage, reciprocal sharing and other social mechanisms provide a means for overcoming discrepancies between rates of food production, which may be quite uneven, and rates of consumption, in which a much lower range of unevenness is tolerated. Strategies for delaying returns can have noticeable effects on settlement decisions for hunter gatherers in highly seasonal environments. This point is illustrated in a comparison of the annual rounds of historic Inuit groups in Arctic Canada and Greenland whose settlement at certain seasons is more dependent on the location of food stores and social contacts than on the temporal and spatial parameters of resource availability and procurement activities.(12)

*McCartney, N.G. (see McCartney, A.P.)(7)*

*McConaughy, Mark (Illinois State Museum) and James B. Richardson III (Carnegie Museum of Natural History)*

**THE HOLOCENE BEACH RIDGES OF THE PIURA AND CHIRA RIVERS: THE IMPACT OF SEA LEVEL AND CLIMATE CHANGE ON CULTURAL DEVELOPMENT ON NORTHWEST PERU.**

Three sets of beach ridges emanate from the mouths of the Piura and Chira Rivers. These are among the best dated Holocene beach ridges in South America. Discussion will focus upon the formation of the ridges through alluviation, the slowing of sea level rise, El Niño flooding, and possibly by tectonic uplift. The reconstruction of the coastal environment will be placed in the context of the associated preceramic and ceramic assemblages.(6)

*McDonald, Mary M.A. (Royal Ontario Museum)*

**ADAPTATIONS IN DAKHLEH OASIS IN THE EARLY- TO MID-HOLOCENE.**

Site location and artifact inventories suggest that three Late Prehistoric cultures identified in Dakhleh represent quite different patterns of adaptation to the oasis and environs during a period of climate change. The rare Epipalaeolithic sites are confined largely to the plateau above Dakhleh, and their closest ties may be with the Nile Valley. The earlier of two Neolithic cultures represents nomadic pastoralists who range widely through the desert, using the oasis only for periodic aggregations. Later Neolithic sites may reflect more settled groups confined, in increasingly arid times, to the oasis itself.(14)

*McEwan, Gordon E. (Dumbarton Oaks, Washington, D.C.)*

**THE SIGNIFICANCE OF THE CHOKEPUKIO SITE IN THE CULTURE HISTORY OF THE VALLEY OF CUZCO, PERU.**

The strategically located, large architectural complex known as Choquepukio dominates the southern entrance to the valley of Cuzco. It has played a significant role in the cultural history of the valley from at least the Early Intermediate Period onward. The results of study of the architectural remains and artifactual evidence from surface collections and excavations indicate that this site is very important for several reasons: (1) it is the only large architectural complex of the Late Intermediate Period to survive in the valley of Cuzco; (2) it represents a stylistic transition in architecture from the Wari-imposed forms of the Middle Horizon to those of the Imperial Inca style of the Late Horizon; (3) it can be identified with the legendary site of Muina, mentioned in the Spanish Chronicles, whose overthrow was a crucial event in the forging of the early Inca State.(17)

*McGovern, Thomas H. (Hunter)*

**TRADE AND SUBSISTENCE IN NORSE GREENLAND.**

Locational, toponymic, biogeographical, and zoo-archaeological data indicate location and goals of the long-distance Nordsetur hunt, and its importance to the Norse Greenlanders' overseas trade connections. Models of Norse subsistence system and the Nordsetur expeditions suggest significant conflict between the two economic components, and a major elite role in promoting a transatlantic connection. Greenland failed to develop a large-scale fishery, relying largely on arctic luxury items. Greenland contrasts sharply with Icelandic and Shetlandic later medieval patterns, where commercial fishing provided a major source of trade goods.(21)

*McGuire, Randall H. (SUNY, Binghamton)*

**THE STRUCTURE AND ORGANIZATION OF HOHOKAM EXCHANGE.**

The prehistoric Hohokam of Southern Arizona were involved in a complex web of exchange relations which linked areas within the Hohokam region, the Hohokam to the greater Southwest and Southwest to Mesoamerica. The most visible commodity in this exchange was marine shell jewelry which the Hohokam traded throughout the Southwest. Other items involved included ceramics, copper bells, macaws, obsidian, corn, and cotton. The web of exchange linked the reproduction of Hohokam society to a much broader sphere and the changes in the nature of interaction, intensity, and structure of the exchange system participated in a much larger system of relationships.(40)

*McGuire, R.H. (see Clark, L.)(29)*

*McHugh, William P. (GAI Consultants)*

**HOLOCENE CULTURAL ADAPTATIONS IN SOUTHWESTERN EGYPT.**

Recent investigations in southwestern Egypt by a number of expeditions have produced evidence supporting a model of Holocene cultural adaptation and paleoclimatology in the area derived from a comparison of the biological and climatic requirements for cattle pastoralism among four widely separated African groups in Niger, Sudan, and Tanzania. Its implications are that the now hyperarid eastern Sahara enjoyed widespread, seasonal rainfall and supported extensive vegetation when this area was inhabited by cattle pastoralists in the early and middle Holocene. Recent archaeological and geological discoveries and cultural chronology pertinent to the proposed model for the area will be reviewed. (14)

*McKillop, Heather (California, Santa Barbara) and Lawrence Jackson (Northeastern Archaeological Associates)*

**DEFINING COASTAL MAYA TRADE STATIONS AND TRANSPORTATION ROUTES.**

Various coastal Maya islands have produced evidence of exotic artifacts exceeding apparent needs of local settlement. Striking examples are tiny river-mouth islands such as Moho Cay, northern Belize and Wild Cane Cay, southern Belize. Classic and Postclassic deposits on habitable island areas of one to four acres contain a remarkable abundance and/or diversity of exotics. Chemical sourcing and analyses of obsidian density help identify these islands as trade stations and also suggest general transportation routes. Comparison of obsidian sources and densities from other Maya sites provides the basis for a coastal Maya trade model.(47)

*McKillop, H. (see Jackson, L.)(22)*

*Meltzer, David J. (Southern Methodist)*

**WERE THERE EXCHANGE SYSTEMS AMONG NORTH AMERICAN PALEO-INDIANS?**

The use of exotic lithic raw materials, a hallmark of Paleo-indian assemblages, is taken as evidence of exchange systems among these groups, though such patterns may equally result from primary procurement of stone at the source of secondary natural transport (as occurs in glacial and alluvial systems) of stone from source to site. Demonstrating exchange requires consideration of Paleo-indian subsistence and settlement strategies, territoriality, and the manner in which exotic material is "packaged" and used in assemblages. While it is difficult to prove, it seems likely that exchange played at best a minor role in the movement of lithic material among Paleo-indians. This lessens but does not exclude the possibility of exchange of other, perhaps perishable, commodities.(40)

*Mena, Francisco (UCLA)*

**FAUNAL REMAINS AND SUBSISTENCE IN ALERO ENTRADA BAKER, CENTRAL PATAGONIA.**

Alero Entrada Baker is a rock shelter located in an ecotone zone between the Andean forests and the open steppe plains in Central Patagonia (47°S). Stratigraphic excavations reveal a series of occupations by hunter-gatherers between the first and eighteenth centuries AD, a period punctuated by

the adoption of the bow and arrow, ceramics and perhaps the horse. A large and well preserved sample of animal bones has been studied in order to reconstruct some aspects of the subsistence system (diet breadth, processing selectivity, seasonality, foraging range). The results through some light on the characteristic resource use pattern in this particular environmental setting, and raise questions concerning the relationships between subsistence stress, social competition and technological change.(25)

**Merbs, Charles F. (Arizona State) and Judy L. Brunson (Arizona State)**  
**BURIAL ORIENTATION AND AFTERLIFE: A COMPARISON OF MODELS FROM THE AMERICAN SOUTHWEST AND THE CANADIAN ARCTIC.**

The Hohokam Indians of southern Arizona and the Thule Eskimos of the Northwest Territories appear to have oriented their dead in relation to the position of the sun at sunrise — toward sunrise in the case of the Indians, and toward or directly away from sunrise in the case of the Eskimos. This study makes use of archaeological and ethnographic evidence to establish the relationship that likely existed between orientation and afterlife, evaluates the use of orientation data in determining burial seasonality, and examines the stability of orientation patterns during periods of stress.(34)

**Merkel, J. (see Shimada, I.)(32)**

**Mester, Ann M. (Illinois, Urbana-Champaign)**  
**PATTERN BURNISHED CERAMICS FROM A MANTENO TRADING CENTER.**

The Manteno Phase is distinguished by smudged bowls, pedestal plates, and jars with pattern burnished decoration. Burnishing indicates limbs and garments on anthropomorphic pots, while complex geometric designs organized radially appear on compoters and open bowls. Recent excavations from the Manteno trading center of Los Frailes provide the samples for a detailed analysis of burnished designs. These motifs are then compared to those of the Libertad and Guangala Phases of Ecuador, and to Cahuachi pattern burnished ceramics of coastal Peru. Finally, an assessment is made of the relations among these styles and their possible significance to an understanding of Andean long-distance maritime trade.(28)

**Mick-O'Hara, Linda (New Mexico)**  
**DISTRIBUTIONAL ANALYSIS: AN ATTEMPT TO UNRAVEL COMPLEXITY IN PUEBLOAN PREHISTORY.**

Present site structural studies have concentrated on mobile, non-Western populations to gain knowledge about material distributions that might be observable archaeologically. Since the archaeological remains of sedentary populations are more than a degree different from those of hunter-gatherer sites, our task is to reorient our present knowledge of site structure and gain new understanding about sedentary site restructuring, reuse, and disposal patterns. Material patterning from both the ethnographic and archaeological record is discussed in terms of Puebloan site complexity. The distribution of structures and remains allows us a better understanding of site processes and the behaviors that could have produced the archaeological record of the Puebloan Southwest.(27)

**Milanich, J.T. (40)**

**Miller, Arthur G. (Maryland, College Park)**  
**MURAL EVIDENCE FOR INTERREGIONAL INTERACTION DURING MA IIB/IV.**

The facade of Monte Alban Tomb 125 bears the most atypical examples of Zapotec mural painting known from the Valley of Oaxaca. The painting was done in two episodes, which were executed in two distinct styles, each associated with tomb reentry episodes during period MA IIB/IV. These recently recorded and analyzed murals reveal that one of their two styles is associated with stone carving in both the Mixteca Baja and El Tajin and that the other resembles mural painting from northern Yucatan. This paper examines the evidence for these observations and explores their implications for understanding what appear to be external influences at Monte Alban.(5)

**Mills, Anthony, J. (Royal Ontario Museum)**  
**HISTORICAL PERIODS IN THE DAKHLEH OASIS.**

The Dakhleh Oasis provides an opportunity to study man's development in the changing landscape of its environmentally sensitive area. (1) Pharaonic Egyptian settlers' arrival in mid-third millennium in this area largely unadapted to their agrarian technology and their interaction with local Neolithic population. (2) The massive influx of settlers/farmers during the period of Roman rule (1 - 400 AD) is made possible by new technology, an altered landscape and an expanding economy. When conditions change, the trend falters and the population declines. The material for this paper arises from an on-going field project in the Dakhleh Oasis, Egypt.(14)

**Mills, Barbara J. (New Mexico)**  
**VESSELS VS. SHERDS: AN INTERPRETIVE DICHOTOMY.**

Functional interpretations using archaeological ceramics have burgeoned in recent years. These interpretations may be very distinctly divided into two categories based on their sources of data and methodological goals: (1) inferences about subsistence, based on the analysis of vessels, and (2) inferences about settlement, based on the analysis of sherd assemblages. This paper argues that this is a fundamental dichotomy and yet there is a need to integrate the two areas of research. The two interpretive approaches are summarized, and potential methods for their integration are discussed.(50)

**Moe, Jeanne M. (Utah, Salt Lake City)**  
**THE EFFECTS OF TRAMPLING ON SUBSURFACE ASSEMBLAGES: AN ALYAWARA CASE STUDY.**

Recent research has shown that trampling by site occupants may have a significant effect on the spatial distribution and content of subsurface assemblages. Surface deposited objects may be differentially buried to depths of several tens of centimeters according to object size or weight. Data from a recently occupied and abandoned Alyawara settlement in Central Australia provides a basis to examine the effects of trampling. Sizes and weights of objects in the subsurface assemblage produced by trampling as well as in the surface assemblage were analyzed and compared to determine the best predictor of subsurface assemblage content. Surprisingly, object width accounts for frequency of downward migration better than either length or weight. The practical archaeological implications of these results are assessed.(15)

**Moholy-Nagy, Hattula (Michigan)**  
**TEOTIHUACAN BURIALS AT TIKAL, GUATEMALA.**

Evidence of Teotihuacan contact in the form of architectural, iconographic, ceramic and other artifactual styles, and in the presence of actual objects apparently imported from Central Mexico, has long been known at Tikal. Another class of evidence has now been recognized: A group of 8 interments that closely resemble some Classic period burials from Teotihuacan. Characteristics of the Tikal burials and their temporal and spatial distribution suggest the existence of an enclave of Teotihuacanos on the SW peripheries of Central Tikal during the Period that the Manik 3A ceramic complex was in use. Some of the social and political implications of a physical presence of Teotihuacanos at Early Classic Tikal will also be explored.(11)

**Montet-White, Anta (Kansas)**  
**GRUBGRABEN, A GRAVETTIAN SETTLEMENT IN LOWER AUSTRIA.**

The primary objective of the Grubgraben research project was to investigate changes undergone by late Gravettian settlements under the pressure of increasingly cold and dry climatic conditions at the onset of the last Pleniglacial.

Grubgraben is a large, multicomponent, open-air site in Lower Austria; 4 occupation layers are stratified in a series of loess deposits. The uppermost level is an intraloess occupation. Evidence suggests a briefly occupied campsite. The main layer marked by the presence of stone structures, abundant faunal remains and highly reduced tools at the junction of 2 loess deposits. The archaeological sequence is tentatively correlated with layers 5-9 at Willendorf.(16)

**Moore, Jerry D. (California-Santa Barbara)**  
**THE CHIMU EMPIRE AND RAISED FIELD AGRICULTURE IN THE CASMA VALLEY, PERU.**

The Chimu Empire (AD 900-1470), located on the North Coast of Peru, expanded into the Casma Valley early in the 14th century. The Casma Valley was integrated into the Chimu Empire in diverse ways. One example of this was the construction of a complex of raised agricultural fields, the only raised fields reported for the Peruvian coast. The fields were constructed by workers who lived in an adjacent planned settlement that was partially maintained by the Chimu state. Data from 1986 excavations in the fields and the settlement are presented, and the significance of these data for understanding prehistoric imperialism is discussed.(17)

**Moore, Katherine M. (Michigan and Harvard) and Margaret J. Schoeninger (Harvard)**  
**QUANTITATIVE RECONSTRUCTION OF PREHISTORIC DIET IN PERU.**

Analysis of archaeological remains from the cold, high altitude grasslands of Junin, Peru, allowed estimates of the make up and quality of the preceramic diet. Faunal remains suggest that hunting and herding dominated economic activity in this area, which is above the limits of agriculture. Bone composition data provide quantitative estimates of the human diet: humans, herbivores, and carnivores have been analyzed for trace elements in bone, and for stable isotopes of N<sub>2</sub> and CO<sub>2</sub> in bone collagen. The <sup>15</sup>N values for humans (x = +10.2) show a clear separation from the herbivores, suggesting carnivory.(49)

Moore, K. (see Spielmann, K.)(1)

Moreau, Jean-Francois (Québec, Chicoutimi)

**MARITIME AND INLAND ARCHAIC ADAPTATIONS IN MID-EASTERN QUEBEC.**

Recent archaeological work in the head and mouth areas of the Saguenay river shows that Archaic occupations exhibit much more variation than is usually thought in a subarctic environment. In the head area numerous sites are akin to the southwestern Laurentian Archaic tradition. Northern as well as Western influences and/or intrusions are also noticeable. However, these outside influences are counterbalanced by continuous long term occupation since the first millennium BC. In the mouth area, a 5,000 BP occupation is characterized by a very intensive seal exploitation, associated with a lithic assemblage of essentially Laurentian Archaic style. This whole pattern of Archaic heterogeneity in such a relatively small region may be accounted for by peculiarities of the ecological setting since this whole area is not of the boreal forest type but of mixed forest type and by the very numerous waterways, Saint-John lake playing the role of a center place into which rivers flow from the North (James Bay) and the West (Saint-Maurice area) and drain toward the Saint-Lawrence.(22)

Moseley, Michael E. (Florida), Christopher Ohm Clement (Florida) and Jorge Elias Tapia (San Marcos)

**GEOARCHAEOLOGY ON THE SOUTH COAST OF PERU.**

Recent research on the south coast of Peru focuses on the effects of tectonically induced coastal uplift on local subsistence practices. Two problem areas are defined: (1) the changes in diet and foodways of an early preceramic, maritime culture resulting from a fluctuating littoral zone and; (2) the effects of changing hydrological patterns on irrigation agriculture systems. Examining changes in the relative accumulation of shellfish species in a midden deposit through time allows the tracking of a changing littoral zone caused by coastal uplift. Changes in the hydrological regime which affect irrigation agriculture lead to specialized farming techniques which are better evaluated following an understanding of the selective pressures which cause their adoption.(6)

Mulholland, Mitchell T. (Rensselaer Polytechnic Institute)

**INFORMATION FLOW IN ARCHAEOLOGICAL DATA MANAGEMENT.**

Since the introduction of microcomputers, data base management has become a widely used technique in archaeology. System design and the sequence of information flow are critical components in the archaeological data management process. An effective system must: 1) structure data collection in the field and laboratory to fit research designs well in advance of excavation, 2) expand the analytical process, and 3) reduce recording efforts. ARDVARC, a dedicated archaeological data manager is used as an example of a system which effectively structures, evaluates and curates archaeological information for site locational surveys, remote sensing surveys, site examinations and archaeological excavations.(39)

Mulholland, S.C. (see Rapp, G., Jr.)(53)

Munson, Cheryl Ann (Glenn A. Black Laboratory of Archaeology, Indiana) and Charles M.

Niquette (Cultural Resource Analysts, Inc.)

**LANDS UNSUITABLE FOR MINING, AN UNSUITABLE PRESERVATION TOOL.**

In the eastern coal states, where regulatory options that serve to protect significant archaeological sites are severely limited, the lands unsuitable for mining (LUM) petition process would appear to provide at least one tool for preservation. Two LUM petitions, filed in Indiana and in Kentucky, provide contrasting examples for examining this process as a viable preservation mechanism. The LUM process is shown to generate legal muddles and antagonism. As such, the process is considered an abysmal preservation tool.(18)

Munson, C.A. (31)

Murray, Matthew L. (Harvard) and Margaret J. Schoeninger (Harvard)

**DIET, STATUS AND THE EMERGENCE OF COMPLEX SOCIAL STRUCTURE IN IRON AGE CENTRAL EUROPE: SOME CONTRIBUTIONS OF BONE CHEMISTRY.**

Techniques of bone chemistry analysis are used to test recent models of Iron Age social organization based on traditional archaeological, historical and ethnographical observations. Human remains from twenty burials at Magdalenska Gora, Slovenia, are selected for isotopic analysis. These burials represent different depositional phases and varied burial wealth. A complement of early Iron Age floral and faunal remains is analysed to supplement the chemical dietary evidence. When compared to the archaeological evidence for status, these isotopic data offer a fresh perspective on the social organization of an early Iron Age community, and show considerable promise for the study of the evolution of complex European society.(48)

Musser, J.M., Jr. (see Dalan, R.A.)(43)

Nagle, Christopher L. (Smithsonian)

**INUIT AND PALEO-ESKIMO RAW MATERIALS PROCUREMENT AND EXCHANGE IN THE EASTERN CANADIAN ARCTIC: SYSTEM STRUCTURE AND IMPLICATIONS FOR STUDIES OF OTHER EGALITARIAN SOCIETIES.**

The Paleo-Eskimo and later neo-Eskimo (Inuit) inhabitants of the Eastern Arctic required a wide variety of organic and inorganic materials on which their technologies and ideologies were based. Although many were procured directly, as a consequence of seasonal movements and activities, others were obtained from great distances by exchange. Focusing on the geographic distributions of sources for various kinds of materials, and exploring the relationships between procurement of different materials, it has been possible to reconstruct the structure and details of their procurement and exchange systems. These data have important implications for similar investigations of other egalitarian, hunting/gathering societies.(40)

Nass, John P., Jr. (Ohio State)

**HOUSEHOLD ARCHAEOLOGY AND FUNCTIONAL ANALYSIS AS PROCEDURES FOR STUDYING FORT ANCIENT COMMUNITIES IN THE OHIO VALLEY.**

The smallest unit of the archaeological community is the social arrangement known as the household and its archaeological correlate called the household unit. The household serves as a synthesizing unit in that it binds together a variety of classes of data such as artifacts, dwellings, features, burials, and activity areas. Once identified, households afford the opportunity to study variation within both material and social organization aspects of communities. The role of functional or use-wear analysis in the study of households in general, and Fort Ancient in particular is discussed. Problems of artifact sample site, selection of use-wear data, and methods of household identification will also be reviewed.(56)

Nelson, Erle (Simon Fraser)

**ACCELERATOR MASS SPECTROMETRY RADIOCARBON DATING AND ARCHAEOLOGY: PRESENT AND FUTURE IMPACTS.**

The new method of Accelerator Mass Spectrometry radiocarbon dating was invented almost exactly one decade ago. Since that time, the procedure has slowly matured to the point that it is now having a significant impact on archaeological research. Using examples drawn from the experience of the RIDDL Group, this paper will discuss the powers and limitations of the method, provide descriptions of present-day applications to archaeology, and attempt to predict the future benefits that we may expect from continued development of this method.(23)

Nelson, F.W. (see Baugh, T.G.)(40)

Nelson, Robert E. (Colby)

**QUATERNARY GEOLOGY AND PALEOECOLOGY OF THE KARLUK AREA, KODIAK ISLAND, ALASKA.**

Surficial geology of the Karluk area is complex and includes deposits left by at least two incursions of glacial ice from Shelikof Strait. Uppermost deposits in the area around Karluk consist mainly of outwash derived from inland glaciation on Kodiak Island itself. Postglacial downcutting by the Karluk river has left numerous fragmental terrace surfaces; known archaeological sites are typically located on the lower terraces, but deposits of volcanic ash may mask minor sites on upper slopes. Local tectonic activity has probably played a role in the past in determining coastal settlement patterns. Shrub alders invaded the landscape immediately following deglaciation; regional vegetation has changed little in postglacial time.(7)

Netherly, Patricia J. (Massachusetts, Amherst)

**BEHIND THE MANGROVE: CULTURAL CHRONOLOGY AND SETTLEMENT PATTERN IN THE ARENILLAS VALLEY, SOUTHEASTERN COASTAL ECUADOR.**

Continuing archaeological research in the Arenillas Valley indicates that this region has a ceramic chronology and cultural history somewhat different from that of the better-known Guayas, Santa Elena Peninsula, and Manabi regions. A regional chronology based on ceramics and C-14 dating will be presented and correlated with settlement pattern and subsistence strategies. The data from the survey of the Middle and Lower Arenillas Valleys will be used together with the results of test excavation at selected sites in the Middle and Lower valleys. The relationship between inland areas and those on the mangrove coast, as evidenced by ceramics and the movement of shellfish and marine and estuarine fish species, will also be considered.(28)

**Nicholas, George P. (Massachusetts-Amherst and American Indian Archaeological Institute)**  
**JASPER EXTRACTION AND THERMAL MODIFICATION TECHNOLOGIES, AND THEIR**  
**BEHAVIORAL IMPLICATIONS, IN SOUTHWESTERN NEW ENGLAND.**

A new lithic source area has been identified in the Berkshires of northwestern Connecticut and western Massachusetts where jasper and jasperoid are found in the quartzite conglomerate of the Dalton Formation. At the Carlson 1 site, NW Connecticut, there is evidence that jasper was extracted from the matrix by a combination of percussion and thermal fracturing, and then possibly modified by additional heat treatment. One feature consists of 15m<sup>2</sup> of fire-reddened soil, charcoal, production debris, hammerstones, and other artifacts. The behavioral implications of this apparently labor-intensive technology are discussed, as are source area locations and site distribution patterns.(31)

**Nicholas, Linda M. (Wisconsin, Madison) and Gary M. Feinman (Wisconsin, Madison)**  
**ECONOMIC SPECIALIZATION AND EXCHANGE IN OAXACA: THE PRODUCTION AND**  
**TRANSPORT OF SHELL, CLOTH, AND OBSIDIAN IN THE EJUTLA REGION.**

Despite its demographic and political marginality, the Ejutla Valley was surprisingly important as an economic gateway involved in the production and exchange of certain exotic goods. Shell, obsidian, and spindle whorls were relatively more abundant in the Ejutla region than in the Valley of Oaxaca proper, and their spatial distributions may indicate one route by which these products entered Central Oaxaca. For Ejutla, the advent of these economic activities seems to be tied to the development of a more integrated regional system in the Central Valley of Oaxaca.(5)

**Nichols, Deborah L. (Dartmouth)**  
**CHANGING COMMUNITY PATTERNS AND INTENSIFICATION OF SOCIAL NETWORKS**  
**DURING THE BASKETMAKER-PUEBLO TRANSITION ON NORTHERN BLACK MESA,**  
**ARIZONA.**

Southwestern archaeologists have long recognized the importance of site community patterns for inferring prehistoric social networks. Results of systematic surveys of a 289 km<sup>2</sup> area of northern Black Mesa, Arizona, supplemented by a large body of excavation data, provide an excellent opportunity to examine changes in community patterns during the Basketmaker-Pueblo transition in light of recent models of Anasazi sociopolitical organization. Specifically, this paper examines the development of standardized habitation site layouts as evidence of social network intensification in response to changing social, and possibly physical, environmental conditions.(51)

*Nichols, J.* (54)

**Niemczycki, Mary Ann (Southeast Missouri State)**  
**DEMOGRAPHIC CHANGE AND THE EVOLUTION OF IROQUOIS CULTURE IN WEST-**  
**CENTRAL NEW YORK.**

Traditional views of in situ Iroquois development have come increasingly under attack due to their inability to identify specific causal factors which trigger the evolution of tribal organization. Analysis of archaeological data from west-central New York reveals that changes in settlement patterning associated with the evolution of Seneca Iroquois tribal society are preceded by the movement of an Ontario Iroquois population into this region. This data further suggests that Seneca tribalization may be viewed as the development of an effective adaptive response to a situation of increasing risk due to environmental uncertainty (see Braun & Plog 1982) associated with demographic changes which follow this event.(36)

*Nieto G., L.F. (see Brown, R.B.)*(30)

**Niles, Susan A. (Lafayette)**  
**THE PROVINCES IN THE HEARTLAND: STYLISTIC VARIATION AND ARCHITECTURAL**  
**INNOVATION NEAR INCA CUZCO.**

The architectural style that spread with the Inca Empire is one that shows, on the face of it, remarkable uniformity. A closer analysis reveals a style that is admirably suited to the realization of Inca imperial goals, and to expressing the hierarchical relations that prevail in the Inca social order. The sites that show the greatest range of stylistic variation are the estates built by particular Inca lords. Study of the standing architectural remains on the royal estates near Cuzco helps us to understand the Incas' perception of their relationship to subject populations, and suggests that the estates modeled the social order expressed in the organization of the provinces.(41)

*Niquette, C.M. (see Munson, C.A.)*(18)

**Noble, Wm. C. (McMaster, Hamilton)**  
**HISTORIC IROQUOIS SETTLEMENTS OF THE ONTARIO-NIAGARA FRONTIER REGION.**

Settlement patterns of the 17th century Neutral, Erie, and certain League Iroquois are examined for the Ontario-Niagara Frontier region. Various levels of inquiry help to define 1) site distributions

2) basic modes of architecture 3) local and regional settlement successions 4) comparative resource utilisation, and 5) problems in determining socio-political affiliations. The Niagara Frontier and adjacent Ontario peninsula is a key zone for understanding the complex interactions between the historic Neutral Iroquois and their neighbours in New York, Pennsylvania, and Ohio.(36)

**Nodine, Bruce K. (Brown)**  
**THE ANTILLEAN ACERAMIC: PRELIMINARY RESULTS FROM A SURVEY OF SITES ON**  
**ANTIGUA, WEST INDIES.**

The island of Antigua has more aceramic sites than any other island in the Lesser Antilles. A survey of the 43 known sites reveals new information concerning aceramic site location attributes. Most sites conform to models of site location which predict access to shallow marine estuary resources; however, at least three sites are anomalous in that they are located more than 500M from the present sea shore, at elevations in excess of 90M. The differences between these anomalous sites and the more common sites are presented, followed by alternative hypotheses, to be tested by excavations, which may account for their location.(37)

*Noller, J.S. (see Wells, L.E.)* (6)

**Nuñez Atencio, Lautaro (Universidad del Norte, Chile)**  
**OCUPACIÓN INKA EN EL TERRITORIO ATACAMEÑO (NORTE DE CHILE).**

En el área andina centro sur se desarrolló tardíamente un señorío agro-pastoril de etnoidentidad diferenciada del resto del área, que ocupó las tierras medias y altas en torno a la puna de atacama. Se analiza la naturaleza de esta ocupación inka en relación a arreglos socio-políticos con los líderes locales, con referencia a la co-existencia del centro inkaico Catarpe con el centro local de Quito, la presencia de rasgos inkaicos en la funebria local, y la instalación de una colonia inka del patron altiplanico en un ayullo local a tiempo del contacto Europeo.(41)

*O'Brien, M.J.* (54)

**O'Connell, J.F. (Utah, Salt Lake City), K. Hawkes (Utah, Salt Lake City) and N.B. Jones (UCLA)**  
**HADZA SITE STRUCTURES: AN ETHNOGRAPHIC OVERVIEW.**

The Eastern Hadza occupy a small area of Tanzania east of Lake Eyasi. Their traditional life as hunter-gatherers has been described by Kohl-Larson and Woodburn. During the 1960s and 70s, they were subjected to several resettlement schemes by the Tanzanian government, but have since returned to the bush. Systematic observations of contemporary Hadza life, including the organization and distribution of activities at residential base camps, are reported for the first time. After a description of structures and facilities at a sample of seven Hadza camps the character and distribution of activities within those camps are described, drawing on the results of systematic quantitative behavioral observation. Archaeological implications of these data are specified, with special attention to patterns of association anticipated among various types of refuse, and the scales of which these should be apparent.(44)

**Ortiz Ceballos, Ponciano (Universidad Veracruzana)**  
**THE ARCHAEOLOGICAL RECORD AS AN INDICATOR OF HOUSEHOLD GARDENING**  
**STRATEGIES IN PREHISTORIC MesoAMERICA.**

Most recent research on prehistoric subsistence in Mesoamerica has dealt with outfield production systems. Often neglected is the dooryard garden, which ethnohistoric sources suggest provided substantial inputs to household subsistence. This paper examines the classes of residues dooryard gardening might leave in the archaeological record. Four kinds of evidence are specifically discussed: archaeofloras, relict gardening features, site spatial organization, and regional settlement patterns. Illustrative materials are provided by recent research in Mexico and Central America.(42)

**Ortloff, Charles (California, Santa Clara)**  
**A THERMO-HYDROLOGICAL ANALYSIS OF RAISED FIELDS IN THE TIWANAKU**  
**HINTERLAND.**

This paper addresses the thermal and hydrological properties of raised fields within the Pampa Koani zone of Lake Titicaca, Bolivia. The analysis focuses on a computer model of the thermal properties of the raised fields within a theoretical twenty-four hour diurnal cycle. The analysis also examines the general hydrological characteristics of the fields within their lacustrine setting. The variability of thermal and hydrological properties within different field formations is further considered.(52)

*Ostoja-Zagorski, Janusz (Instytut Historii Kultury Materialnej Polskiej, ZAKAD ARCHAEOLOGII WIEKOPOLSKI, Poznan, Poland)*  
**DEMOGRAPHIC AND ECONOMIC CHANGES IN THE HALLSTATT PERIOD OF THE LUSATIAN CULTURE.**

In the declining phase of the Hallstatt Period, the 7th and 6th centuries B.C., the Lusatian Culture in the region of the Oder and Vistula River basins in what is today northwest Poland underwent a socio-economic developmental leap, as evidenced by the appearance of large fortified settlements for the first time. This transformation can be explained by a deterioration of the climate and concomitant demographic pressure which caused an increase in the demand for limited provisions. This demand in turn caused the intensification of non-farming occupations, such as cattle-breeding, which led to an ecological imbalance, which necessitated concentration of the population in nucleated settlements.(48)

*Otte, Marcel (Liège, Belgium)*  
**THE NORTHWEST EUROPEAN PLAIN AT 18,000 B.P.**

This paper will discuss the cultural traditions (technology, economy, and artistic) of this region during the Last Glacial Maximum and define the relationship between east and west Europe. It will focus on the migration and diffusion of cultural traits - the formation of the Solutrean as well as deal with the isolation of the eastern and central regions. Finally it will consider the question of the recolonization of northern regions during the late glacial and the origins of the Magdalenian, Creswellian, and Hambourgnian groups as well as the reciprocal influences in their evolution.(20)

*Pagoulatos, Peter and Kathleen Furgerson (Connecticut)*  
**TERMINAL ARCHAIC LITHIC PROCUREMENT AND UTILIZATION: A VIEW FROM THE CONNECTICUT RIVER VALLEY.**

The primary purpose of this paper is to examine Terminal Archaic lithic procurement and utilization in the Northeast. Hypotheses concerning tool curation, manufacture, site specific activities, and exchange are addressed, using current data from the Connecticut River Valley.(31)

*Pailles, Richard A. and Joseph W. Whitecotton (Oklahoma)*  
**CULTURE AND EXCHANGE IN MESOAMERICA AND THE SOUTHWEST.**

Many archaeologists persist in using cultural and ethnic units as starting points in the analysis of exchange systems. In Mesoamerican studies, "ethnic" boundaries are often seen as obstacles to exchanges between elites and specialists, while Southwesternists similarly "reify" exchanges between the Southwestern and Mesoamerican culture areas. We argue that social systems should form the basis of exchange models, and that cultural differences may actually promote exchange. Artificial distinctions between "preciosities" and "essentials" and between "market" and "redistributive" economies result from a failure to view exchange as a social process involving specific groups of individuals rather than cultural entities.(8)

*Paradis, Louise I. (Montréal)*  
**TEOTIHUACAN AND GUERRERO.**

There are several indices for the presence of Teotihuacan in Guerrero (ceramics, sculpture, architecture); these have been found in various contexts and, it seems, constitute a minor contribution to the local cultural inventories. There is less well-defined evidence for the presence of Guerrero in Teotihuacan; thus, it has been proposed that the lapidary art in Teotihuacan was influenced or actually made by artists from Guerrero, the origin of Granular Ware, widely distributed in the Basin of Mexico, Morelos and Guerrero, has still to be determined. This paper will explore the evidence and context for the relationships that have existed between Guerrero and Teotihuacan in an attempt to evaluate the nature of Teotihuacan influence in the State of Guerrero.(11)

*Parker, Patricia L. (National Park Service, Washington)*  
**OVERVIEWS: DO THEY FULFILL THEIR PROMISE?**

The purpose of an overview is to provide a basis for research that advances beyond the boundaries of previous work. It should not only summarize what has been done in an area in the past, but try to make sense of the results of what has been done, and establish possible directions for further investigation. On the whole, the evolution of overview methodology since the early 1970s has been in the opposite direction, toward generation of summaries for their own sake, unconnected with directions for future research. Examples of this problem are presented, results discussed, and an alternative model presented.(54)

*Parkington, John (Cape Town)*  
**THE END OF THE PLEISTOCENE IN SOUTHERN AFRICA.**

A survey of radiocarbon dates from southern Africa shows that there are very few occupations dated to the Last Glacial Maximum (LGM). Long sequences in the Cape, Namibia, the eastern escarpment

and the Kalahari fringe show variable patterns of dates with a general trend of increase after the LGM. Questions of uneven survival of datable samples, uneven research emphases and the relationship between dates and human population densities are discussed. Some role for environmental change in influencing population numbers and distribution seems unavoidable.(20)

*Parkington, J. (see Yates, R.J.)(38)*

*Pate, Donald (Brown)*  
**EXCHANGEABLE IONS IN BONE AND SOIL AS INDICATORS OF POSTMORTEM DIAGENESIS.**

The chemical composition of human and faunal bone excavated from archaeological sites can provide the anthropologists with a wide range of information including relative and chronometric dates, paleodiet, and paleohydrology/paleoclimate. However, meaningful inferences from bone chemistry are dependent upon a control for postmortem diagenetic alterations in the burial environment. X-ray diffraction and infrared absorption analyses indicate that dissolution and recrystallization do not occur until thousands of years after burial. However, ionic exchanges between the soil solution and calcium phosphate crystal surfaces may still occur. Exchangeable ions in bone and soil are examined to address these postmortem exchanges.(1)

*Paul, M. (see Long, A.)(23)*

*Paulsen, A.D. (28)*

*Pavlish, L.A. (Toronto)*  
**TO HEAT OR NOT TO HEAT, THAT IS THE QUESTION!**

A major problem encountered in attempts to understand the use of heat in lithic technologies is the difficulty of distinguishing between intentionally and accidentally heated materials. A method for doing this is proposed and applied to eastern Paleo-Indian site assemblages. The method reveals examples of partial heating which appear to have been an important, heretofore unrecognized variant of the process. The presence of partial heating may improve our understanding of the skills possessed by the ancient technologist, and will go a long way towards setting straight the confusion that surrounds the concept of heating stone in the ethnographic literature.(46)

*Pavlish, L.A. (see Jopling, A.V.)(15)*

*Pavlish, L.A. (see Julig, P.J.)(46)*

*Pavlish, L.A. (see Sheppard, P.)(16)*

*Pendergast, David M. and Elizabeth Graham (Royal Ontario Museum, Toronto)*  
**DIPPING OUT THE OCEAN WITH A SPOON: PLUNDERING ON THE INTERNATIONAL SCENE.**

Although the passage of legislation ratifying the UNESCO convention appeared to be a major step in reducing international trade in archaeological material, in fact the problems remain at least as severe as in earlier years. This paper explores the field situation in Belize, and the Maya area in general, as an example of the current difficulties. It also reviews the course and effectiveness of local and international legal action in attempting to bring the destruction of archaeological remains to a halt, and suggests steps that might help to produce this result in the future.(2)

*Pendergast, D.M. (see Jones, G.D.)(45)*

*Pendery, Steven (Boston Landmarks Commission)*  
**PATTERN IN MATERIAL LIFE IN COLONIAL CHARLESTON, MASSACHUSETTS.**

This paper examines the active role of material lifestyle in expressing and perpetuating social and economic differences among occupational groups in a colonial new England seaport (Bourdieu 1984; Nash 1979). It is argued that occupational status, as much as wealth, conditioned both general and specific patterns of investment in goods of production and consumption in colonial Charleston, Massachusetts, indicated by archaeological and documentary evidence. Converging trends in consumer behavior of eighteenth-century merchants and craftsmen masked an increasing concentration of wealth in merchant hands.(29)

*Pereira, D. (see Brockington, D.L.)(49)*

*Peterson, James B. (Maine, Farmington) and Nathan D. Hamilton (R.S. Peabody)*  
**THE PISCATAQUIS ARCHAEOLOGICAL PROJECT: 1985 AND 1986 SEASONS.**

Excavations at five stratified sites in the Piscataquis Archaeological Project study area have revealed deep stratigraphy and a long human occupational sequence from 10,300 B.P. onward. A local chro-

nology has been established on the basis of multiple radiocarbon dates (15+). The cultural remains and their contexts provide a framework for the study of late Pleistocene and Holocene human adaptations to local environments and enable correlation with other local and regional samples. Particular attention is given to chronology, settlement patterns and site variability since comparable sequences have been established rarely in northeastern North America.(22)

*Phagan, Carl J. (NAU-MNA, Flagstaff)*

**A PRELIMINARY PROJECTILE POINT TYPOLOGY FOR THE NORTHERN SINAGUA.**

A preliminary projectile point typology for the Southern Colorado Plateau's Sinagua cultural sequence is presented. The typology is morphological with temporal, spatial, and technological variability correlated independently with types. Variables are quantitatively assessed and selected, and types are produced with multivariate procedures. This research is a result of the 1986-87 Colorado Plateau Distinguished Scholar-in-Residence program, sponsored jointly by the Museum of Northern Arizona and Northern Arizona University.(56)

*Pickin, Frances R. (SUNY, Buffalo)*

**CULTURAL EVOLUTION AND ALLOMETRIC GROWTH.**

The study of cultural evolution often employs analogies from other disciplines. In the 1950s, Raoul Naroll attempted to transfer the principle of allometric growth (the tendency for parts to grow in a constant proportion to the size of the entire body) from biological to cultural evolution. His research indicates that such relationships exist in ethnographic data. Based on the assumption that allometry is not confined to contemporary societies, this study uses a sample of eleven prehistoric sequences to examine the evolutionary relationships between cultural heterogeneity and population size. The results and methodological considerations of this type of cross-cultural archaeological study are discussed.(32)

*Pihl, Robert H. (Western Ontario)*

**NEW PERSPECTIVES ON POINT PENINSULA MIDDLE WOODLAND IN EASTERN ONTARIO.**

The traditional view of Point Peninsula as a homogeneous culture based on egalitarian principles is now open for re-evaluation. Two important aspects are considered: 1) inter-regional cultural differences identified in terms of varying ceramic and other artifact styles; and 2) localized indications of complex social and political organization in specific economic and mortuary patterns and osteological evidence. Illustrative materials are provided by research in the Trent River-Rice Lake region and St. Lawrence Valley of eastern Ontario. Archaeological problems with Point Peninsula are also reviewed.(33)

*Pippin, Lonnie C. (Desert Research Institute)*

**MODELING THE FORMATION OF TEMPORARY CAMPS AND OTHER SITE TYPES IN THE ARCHAEOLOGICAL RECORD OF THE NEVADA TEST SITE, SOUTHERN NYE COUNTY, NEVADA.**

Great Basin archaeologists have long recognized the difficulties in assigning functional interpretations to archaeological site types and, during the last decade, much attention has been paid to how archaeologists may or may not make these determinations (Bettinger 1975, 1980; Binford 1980; Thomas 1983: 20, 72-91). This paper reviews the existing middle range theory concerning the transformation of hunter and gatherer site types into the archaeological record and then examines several different types of ethnohistoric temporary camps on the Nevada Test Site in order to develop a baseline site formation model for this area of the Great Basin.(51)

*Plug, Fred (Celeron/Goodyear Archaeological Research Laboratory / New Mexico State, Las Cruces)*

**PRESERVATION OF AND FOR WHAT?**

New Mexico State University has undertaken work for private enterprise and government agencies. This paper contrasts experiences in dealing with institutions of various types and identifies problems that arise when cultural resource managers represent private enterprise to government regulators. The utility of overarching strategies such as Programmatic Memoranda of Agreement and "NART's" is considered. The Celeron/Goodyear Archaeological Research Laboratory is used as a case study to indicate the varying roles of CRM, private enterprise, and government. It is argued that a stronger role for cultural resource managers and private enterprise in relation to government is desirable.(54)

*Pohl, John M.D. (UCLA) and Bruce E. Byland (Lehman, CUNY)*

**THE NATURE OF PLACE SIGNS IN THE MIXTEC CODICES.**

Place signs have long been important to the decipherment of the group of Mexican manuscripts known as the Mixtec codices. Since they identify the locations of historical events, place signs are fundamental to studying political interaction among ancient Mixtec elites. A broad concept of scale

has led many previous studies to place principal historical events from these documents within a broader geographical sphere than now seems tenable. The distribution of Postclassic sites in the Tilantongo valley suggests a much different picture.(5)

*Pohl, J.M.D. (see Byland, B.E.)(5)*

*Pokotylo, D. (see Hanks, C.C.)(59)*

*Pollard, Helen Perlstein (Michigan State)*

**TARASCAN CIVILIZATION WITHIN PREHISPANIC MESOAMERICA.**

The Tarascan State (A.D. 1350-1520) has long been viewed as an anomaly among Mesoamerican Prehispanic civilizations. This state has been characterized as either alien, and barbaric, or the product of wholesale importation of Mesoamerican beliefs from central and/or southern Mexico. Utilizing the concept of the elite prestige social system, this paper will focus on the Tarascan elite social system as a source of interaction with other cultural traditions and a contributing variable in the development of Tarascan civilization. Data drawn from archaeology, ethnohistory and linguistics will consider elite ideology, population movements, and the structure of prestige and power.(30)

*Pool, Christopher A. (Tulane) and Robert S. Santley (New Mexico)*

**CONNECTIONS AND INTERFACES BETWEEN PRODUCTION-DISTRIBUTION SYSTEMS IN HIGHLAND MEXICO AND ON THE GULF COAST.**

Exchange is one of the principal mechanisms by which goods are distributed in complex societies. Such distribution systems may be local or involve the movement of goods across system boundaries. In Highland Mexico and on the Gulf Coast certain production-distribution systems were large-scale, internally differentiated, and spatially segregated; others were much smaller in scale, relatively undifferentiated, and oriented primarily to local clientele. Exchange also involved the movement of "information" across the landscape, as reflected by the presence of horizon styles. In this paper data on ceramics and obsidian working are used to illustrate these fundamental differences in system structure, articulation, and function. The effects of transportation mode on system structure and scale are also discussed.(40)

*Portnoy, Alice W. (Texas Tech)*

**A FORMULA FOR ESTIMATING MINIMUM NUMBER OF LITHIC TOOLS.**

In order to account for both complete and fragmentary tools in a lithic assemblage and so gain a more accurate idea of relative proportions of different tool types, a simple formula for estimating the minimum number of individual tools represented in each tool class has been devised. The formula was developed while working on a large assemblage of unifacial flake and blade obsidian tools and is being tested on other kinds of assemblages. The formula is explained, applications of the formula are shown and its limitations discussed.(56)

*Portnoy, A.W. (see Mayer-Oakes, W.J.)(19)*

*Potter, Parker B., Jr. (Brown)*

**THE CONSUMPTION OF IDEAS AND THE PRODUCTION OF BEHAVIOR: PAST AND PRESENT IN ANNAPOLIS, MARYLAND.**

While most of the papers in this session are about the production and consumption of material goods, this paper takes a slightly different focus: the consumption of ideas and the production of behavior, in both the past and the present in Annapolis, Maryland. This entails three main issues. The first is the recursive nature of material culture as a theme in the analysis of archaeological materials in Annapolis. The second is the presentation of this idea, and the results it produces, to residents of and visitors to Annapolis, in the context of archaeological site tours or museum exhibits. The third issue is the presentation to the public of the idea that versions of the past, just like material goods, are produced, consumed, and used. And just as material culture teaches and shapes behavior, so too do various versions of the past call for particular responses and behaviors from those who accept them.(29)

*Powell, S. (26)*

*Powers, Robert P. (National Park Service)*

**THE VIEW FROM THE OUTSIDE: ARCHAEOLOGICAL SURVEY ON THE PERIPHERIES OF CHACO CANYON.**

Recent archaeological survey of 6220 acres added to Chaco Culture National Historical Park provides new data on 709 Chaco Anasazi sites on the peripheries of Chaco Canyon, N.M. Areas surveyed include portions of Chacra Mesa, South Mesa, and two nearby Chacoan outliers, Kin Klizhin and Kin Bineola. Analyses of Anasazi settlement, demography, environment, and surface assemblages



(ceramics and lithics) establish a critical "outside" perspective on Anasazi cultural adaptation in the central San Juan Basin. The purported role of Chaco Canyon as a regional socio-economic center during the Anasazi occupation is clarified, complementing prior extensive studies in the canyon proper.(51)

**Prentiss, William C. (BLM), M. Lee Douthit (BLM) and Eugene J. Romanski (S. Florida)**  
LITHIC PROCUREMENT AND HUNTER-GATHERER ORGANIZATION IN THE CENTRAL BIG HORN BASIN, WYOMING.

In the central Big Horn Basin of northwestern Wyoming, archaeological materials are scattered almost continuously along Pleistocene terraces containing large quantities of quartzite, chert and basalt cobbles. This research demonstrates the existence of complex patterning through the application of factor analysis to data generated from a "nonsite" survey in this region. Pattern recognition is facilitated with an experimental study of debitage variability from different core reduction and tool production strategies. Conclusions are drawn regarding lithic resource utilization strategies and regional settlement and subsistence systems.(56)

**Preucel, Robert W. (UCLA)**  
THE PAJARITO FIELD HOUSE PROJECT: PRELIMINARY RESULTS.

The Pajarito Field house Project was conceived as a problem-oriented research program focusing on the adaptive significance of the "field house strategy." The theoretical orientation of the project is provided by the concentric zone model drawn from economic geography which predicts that field houses should be located only near those fields which are relatively distant from a large pueblo. In order to test this model, the Pine Springs study area was surveyed and several field houses were excavated. The results generally support the model although other kinds of small structural sites are located near pueblos.(26)

**Pritzker, K.P.H. (see Hancock, R.G.V.)(1)**

**Pryor, John H. (SUNY-Binghamton)**  
GIFT BASKETS AND SALE BASKETS: DYNAMICS OF POMO POWER RELATIONS.

This paper will reanalyze ethnographic and ethnohistoric data to show the role of baskets as a material medium in the negotiation of power relations between men and women, elders and youths, and between families in the hunter-gatherer Indians of Northern California (Pomo). It will show that inequality was masked by a strong ideology of equality, which obscured the true power relations. The dynamics of these relations are explored by showing the effect of women basket makers entering the market economy of white society.(58)

**Purser, Margaret (UC Berkeley)**  
MATERIAL CULTURE AND THE STUDY OF CONSUMPTION IN NINETEENTH CENTURY PARADISE VALLEY, NEVADA.

In historical archaeology, material culture is both the meaning-bearing context of human behavior, and the expressive product, or "artifact" of the behavior. The archaeology of 19th-century Paradise Valley, Nevada demonstrates the critical role material culture played in how the relationships of production of goods, national marketing and distribution systems, and the reorganization of social groups were established and then manipulated at a local scale. At a more national or cultural level, the study illustrates how material culture served as a vehicle for interpreting, manipulating, and integrating the broad social changes of the time into the social structure of a given community.(29)

**Pyburn, K. Anne (New Mexico State)**  
THE INVISIBLE UNIVERSE: NON-PLATFORM FEATURES IN THE MAYA LOWLANDS.

Non-platform features have been recorded from many sites in the Maya Lowlands, but their function has seldom been determined. Testing of several such features at the site of Nohmul in northern Belize supports their interpretation as full-time habitations and suggests that a surprising density of invisible domestic features may exist at Nohmul. The implications of these findings for previous estimates of lowland Maya population densities and for future settlement pattern research are reviewed.(24)

**Quick, P. McW. (59)**

**Quilter, Jeffrey (Ripon)**  
ANIMATED OBJECTS IN MOCHE ART.

Animated objects are shown attacking humans in few but important scenes in Moche Art. Scholars have previously discussed this theme as an event described in both Andean and Mesoamerican contact period traditions. But serious objections to this link have been made. The objects in question are specific to warfare weapons and regalia. This paper will discuss the Attack of the Weapons Theme

and related artwork in the light of recent studies of Moche iconography. Concluding remarks will touch upon the cross-cultural aspects of animated, aggressive objects, from the ancient Greek Sorcerer's Apprentice to modern Go-Bots and Transformers.(13)

**Rabich Campbell, Chris (USDA Forest Service)**  
THE NEXADI PHRATRY OF THE SANYAKWAN TLINGIT.

The Sanyakwan are unique among the Tlingit because they have three exogamous phratries and the remaining kwans have only two. The anomolous phratry is the Nexadi. Previous researchers speculated that the Nexadi splintered from the Tsetsaut Athapaskans and became Tlingitized, but Tlingit origin myths disclose the Nexadi as being recognized as Tlingit since migrating to the coast from the Unuk River Drainage. The Nexadi, like all of the Sanyakwan, had intermarried and traded with their Tsetsaut Athapaskan neighbors. This synthesis will shed light upon the cultural dynamics of the region including strong economic ties to the boreal forest environment.(59)

**Ramenofsky, Ann F. (LSU Baton Rouge)**  
DIFFUSION OF DISEASE AT EUROPEAN CONTACT.

A major focus of contact period studies concerns whether or not epidemic diseases decimated native populations during the sixteenth century. While some outbreaks are described in local histories, the question of whether and how far pathogens spread beyond the points of origin is debated. In this paper, the question of sixteenth century disease diffusion in the Southeast is approached from several perspectives: Known or suspected microbial imports are considered epidemiologically to determine their diffusion potential. The archaeological record is evaluated to determine possible diffusion pathways, and whether the record demonstrates the kind of demographic change warranted by disease contact. Experimental evidence derived from geographic diffusion models suggests how suspected pathogens might have spread.(40)

**Randsborg, Klavs (Copenhagen)**  
THE TOWN, THE POWER AND THE LAND: EUROPE AND DENMARK IN THE FIRST MILLENNIUM A.D.

Three major social processes took place in Europe, the Mediterranean Basin and adjacent areas to the East during the 1st millennium A.D.: The decline of the ancient societies (in the disguise of the Roman Empire etc.), the emergence of the successful Medieval West and the integration of the 'Barbarian' World into the 'World' processes. An archaeological perspective of the socio-economics of these developments is given, based on studies of settlement, production, distribution and exchange, etc. Denmark (and northern Europe) is the focus of the discussion.(48)

**Ranere, Anthony J. (Temple) and Richard G. Cooke (Smithsonian Tropical Research Institute)**  
FROM HUNTING-GATHERING TO VILLAGE AGRICULTURE IN THE HUMID TROPICS: A 4000 YEAR LONG PROCESS IN CENTRAL PANAMA.

A recently completed regional study in Panama has documented an 8500 year long sequence of continuous occupation. In this paper, the 4000 year period from the initial appearance of domesticated plants at ca 7000 B.P. to the eventual emergence of intensive agriculture is examined using evidence from (1) settlement patterns, (2) paleoecological and paleogeographic reconstructions, (3) botanical remains, (4) human skeletal remains, (5) faunal remains and (6) lithic and ceramic assemblages. We argue that these data document a largely *in situ* development albeit with extraregional influences at three critical junctures.(57)

**Rapp, George, Jr. and Susan C. Mulholland (Minnesota, Duluth)**  
PHYTOLITH ANALYSIS IN ARCHAEOLOGY.

Phytoliths are microscopic mineral deposits that form in and between plant cells; specialized grass silica cells accumulate abundant and distinctive phytoliths. Our primary classification, based on modern grass phytoliths, has eight shape types: dumbbell, cross, saddle, rondel, sinuous, rectangle, triangle, and pentagon. Grass subfamilies are characterized by assemblages of these types; further research will refine identification to tribes or possibly genera.

Phytoliths are preserved in sediments from the present to the Paleocene. Phytolith analysis at Big Hidatsa, a late prehistoric-early historic Plains Village, indicates that differential use and discard of plants is important. Specific sediment provenience can yield fine-tuned microstratigraphic information.(53)

**Rapson, David J. (New Mexico, Albuquerque) and Lawrence C. Todd (Denver, Colorado)**  
ATTRIBUTE BASED SPATIAL ANALYSIS: AN EXAMPLE FROM A HUNTER-GATHERER SITE IN NORTHWESTERN WYOMING.

Analysis of a hunter-gatherer occupation site examines the differences between the interpretation of distributional and attribute patterning at the level of activities and/or events versus patterning

derived from the integration of a number of discrete activity sets. Patterns of faunal assemblage content including proportional skeletal frequencies, population age/sex structure, anatomical refits, evidence of butchery from cut marks, impact fractures, and burning will be considered in terms of their spatial distribution in an attempt to relate specific activities to the organizational structure of the archaeological site's inhabitants.(25)

**Ratray, Evelyn C. (UNAM, Mexico)**  
**CIRCULAR STRUCTURES ON THE GULF COAST AND AT TEOTIHUACAN.**

The presence of foreign portable objects [Gulf Coast and Maya ceramics, shell, jade, chert] at Teotihuacan has been well documented. Recent excavations at the "Merchants" Barrio, Teotihuacan, reveal that a distinctive style of architecture, round structures with ramps, was probably introduced by a group of foreigners in the Early Classic Period. The structures bear close resemblance to those reported on the Gulf Coast. The significance of these finds and their spatial and temporal distribution will be discussed.(11)

*Ravesloot, J.C. (see Czaplinski, J.S.)(34)*

*Raymond, J.S. (28)*

*Read, D.W. (see Cleland, K.M.)(39)*

**Reed, Paul F. and Steadman Upham (New Mexico State)**  
**LIMITED ACTIVITY SITES AND LOW VISIBILITY REMAINS: IMPLICATIONS FOR INTERPRETING SOUTHWESTERN PREHISTORY.**

The prehistory of various regions of the American Southwest has been written as though long term developmental sequences, encompassing hundreds of years of developmental continuity within a single cultural tradition, were the rule rather than the exception. Recent research in several geographic areas indicates that such continuity is rare, that discontinuous and episodic patterns of cultural development were more frequent. This paper examines issues related to models of developmental continuity/discontinuity by focusing on the way low visibility archaeological remains, and especially limited activity sites, have been incorporated in regional culture histories.(24)

**Reff, Daniel T.**  
**CONTACT SHOCK AND THE ROUTES OF CONTAGION DURING THE EARLY HISTORIC PERIOD IN THE GREATER SOUTHWEST.**

Epidemics involving Old World diseases frequently spread northward from Mesoamerica into northwest Mexico and the southwest United States during the sixteenth and seventeenth centuries. As a consequence of repeated exposure to smallpox and other maladies, native populations were reduced by as much as 90% prior to ca. 1675. The rate and magnitude of population decline was not, however, uniform and was dependent in part on a group's involvement in native and Spanish trade networks. This point is illustrated through an examination of Spanish and native exchange networks and a comparison of population trends among groups such as the Opata and Tarahumara.(40)

**Reid, Peter (Windsor)**  
**MODELS FOR PREHISTORIC EXCHANGE: SOUTHWESTERN ONTARIO AND SOUTHERN MICHIGAN.**

Four examples of prehistoric exchange in the Middle Great Lakes region are tested against models of "distance decay" of social interaction: the distribution of Kettle Point chert in, respectively, the Archaic, Early and Middle Woodland, and Late Woodland periods, and the distribution of Bayport chert in late prehistoric times. Problems in measuring the variables "distance" and "decay" are briefly discussed. The utility of the results of such analyses is also examined.(33)

**Reilly, Paul (IBM UK Scientific Centre, Winchester, England)**  
**LOOKING AT THE PAST USING ADVANCED GRAPHICS SYSTEMS.**

The application of powerful three-dimensional colour graphics systems used in conjunction with flexible data-management systems make it possible for archaeologists to record and analyse very large volumes of spatial and contextual information in new and exciting ways. Such systems are being used in Britain to assist in the investigation of both excavation and survey data. They are particularly interesting in that they allow archaeologists to reconstruct their primary data (to the level of detail it was recorded at), thus facilitating re-examinations of the material formations revealed. The material can be "viewed" from perspectives which would be impossible in any other way. This often stimulates the formulation of new types of questions which can be asked of the computer model. The potential

of exploring data graphically will be illustrated using several UK organised projects the IBM UK Scientific Centre is involved in. The approach, however, has a much wider application.(39)

**Rhode, David (Washington, Seattle)**  
**EVOLUTION OF SUNFLOWER, SUMPWEED, AND THE EASTERN AGRICULTURAL COMPLEX.**

Sunflower and sumpweed have long been considered prehistoric domesticates of eastern North America based on increases in the size of their seeds. The pattern of morphological evolution of this trait in both plants allows insight into the nature of their coevolution with humans from Archaic through late prehistoric periods. The plants differ slightly in seed size evolution as a result of basic biology, but seed size trajectories are alike in general form and indicate consistent selection for symbiotic relationships between the plants and human agriculturalists through the late prehistoric period, despite competition with maize, other small seeds, and each other.(22)

**Richardson, James B. III (Carnegie Museum, Pittsburgh)**  
**THE ARCHAEOLOGICAL SEQUENCE AND THE RADIOCARBON CHRONOLOGY OF THE CHIRA REGION OF NORTHWEST PERU.**

Sixty-five radiocarbon dates will be used to discuss the preceramic and ceramic period complexes in the PariSas, Chira and Paita regions of the coast of northwest Peru. The ceramic assemblages will be presented in terms of their cultural affinities to the north in Ecuador and to the south in Peru. Currently, the author feels that the preceramic and ceramic periods have close relationships with Ecuador up to the advent of the late Intermediate and Late Horizon in Peru.(28)

*Richardson, J.B. III (see McConaughy, M.)(6)*

*Richardson, J.B. III (see Sandweiss, D.H.)(6)*

**Riddell, Francis A. (California Institute for Peruvian Studies)**  
**ARCHAEOLOGICAL RESEARCH ON THE SOUTH COAST OF PERU.**

Portions of the south coast of Peru have experienced limited attention by professional archaeologists. CIPS is a not-for-profit corporation designed to direct, support and otherwise expedite studies in archaeology and related disciplines centering in the Acari and Yauca valleys, and the Atiquipa and Chala regions of the south central coast of Peru. The area is rich in archaeological remains from lower Early Horizon through the Colonial period. Of priority is the salvage of textiles and ceramics from vandalized cemeteries. Site survey, mapping and test excavations greatly facilitate the understanding of the temporal and cultural relationships and local expression of style in relationship to neighboring, better-known regions of Peru.(49)

**Rigaud, Jean-Philippe (DAPA, Bordeaux, France) and Jan F. Simek (Tennessee, Knoxville)**  
**PREHISTORY OF THE PERIGORD AROUND THE LAST GLACIAL MAXIMUM.**

While the southwestern part of modern France provides this paper's focus, data from other parts of south France will also be discussed. The region has yielded a long series of C14 dates that can be integrated with geological, palynological and paleontological observations to provide a detailed chronology at the 18,000 B.P. time spike. Lithic assemblages are variable in terms of typology, technology, and material utilization: this variability can be explained in both functional and cultural terms. Integration of lithic and faunal data suggests that major changes in human adaptations occurred at or near the 18,000 B.P. time period.(20)

*Rigaud, J-P (see Simek, J.F.)(44)*

**Riley, Thomas J. (Illinois, Urbana-Champaign)**  
**REFLECTIONS IN A LAGOON: MARSHALLESE ATOLLS AS MIRRORS OF HIGH ISLANDS.**

Ethnographic data from the Marshall Islands suggest that a well developed chiefdom existed there despite limiting factors of small populations, limited landmass and high potential for natural disaster. The chiefdom, based on a matrilineal clan system, is partially correlated with the dispersal of clan membership north-south, but it is based on principles of land tenure similar to those of high islands where clan resource use maximizes environmental diversity over the landscape. This is shown in the division of taro pits at Laura village on Majuro where strips of clan controlled land meet. Excavations at the borders of these taro pits suggest that they date to the initial settlement period at Laura village ca. A.D.-B.C. Exploitation of this environmental diversity was an important aspect of initial colonization of this part of Majuro atoll, and perhaps of the Marshalls as a whole.(55)

**Ringle, William M. (Davidson College/M.A.R.I. Tulane), Craig Hanson, Chris von Nagy, Walter Witschey and George Bey (Tulane)**  
**CONTINUING INVESTIGATIONS OF EK BALAM, YUCATAN.**

Results of the 1986 field season at the northern Maya site of Ek Balam are reported. Efforts centered on a laser transit map of the site center and limited excavations within that area. Test pitting has so

far revealed a largely Late to Terminal Classic occupation, but with evidence of earlier Middle to Late Formative occupations. Test pitting of one of the encircling defensive walls showed it too was of Terminal Classic date. Similar walls are found at contemporaneous sites in northwest Yucatan, where ceramic ties are also strongest. Possible implications for the prehistory of the Terminal Classic are discussed.

*Ringstad, C.A. (see Dalan, R.A.)*(43)

*Ritchie, J.C. (Toronto)*

#### HOLOCENE ENVIRONMENTS OF THE EASTERN SAHARA.

Buried lacustrine sediments from four widely separated sites in northwest Sudan have yielded informative data on the environment of the early to mid-Holocene. Analyses of the sediments (physical and chemical) and of the contained algal pigments and pollen are reviewed, and some paleoenvironmental reconstructions are offered. A humid period, with fluctuating lake levels, resulting from a northward transgression of the monsoon, occurred between ca 9500 and 4500 B.P.(14)

*Rivera, Mario A. (UTA, Arica, Chile)*

#### INCA STRATEGIES OF OCCUPATION IN NORTHERN CHILE.

The northern Chile area is explained under its main ecological zones and interpreted following the Inca strategies of occupation. According to regional cultural development, conditions and accessibility to local natural resources, the following Inca patterns are reviewed: (1) Administrative centers, (2) Tambos, (3) Minor installations, (4) Road system. Spatial economic approaches to Inca installations are also studied, mainly in relation to oasis/valley agricultural production; Puna installations for herding of llamas and alpacas; and mining centers.(41)

*Rivera, M. (52)*

*Rivera Sundt, Oswaldo (Instituto Nacional de Arqueología de Bolivia)*

#### EXCAVATIONS IN THE SECTOR OF WILAKOLLU AT LUKURMATA, BOLIVIA.

This paper describes the results of archaeological excavations in the semi-subterranean temple and Kalasasaya structures located in the uppermost platforms which surmount the Cerro Wilakollu sector at Lukurmata. This sector represents the principal civic-ceremonial zone of this ancient Tiwanaku urban center. The research complements the information from Wendell Bennett's 1930s excavations, and permits a more refined analysis of the details of construction of these two ceremonial structures. Finally, this research allows a reinterpretation of the functions of the Wilakollu sector with respect to raised fields at the base of the Cerro, and within the context of state formation in Tiwanaku.(52)

*Roberts, Michael (Timelines, Inc.)*

#### AN ASSESSMENT OF THE EVOLUTION OF ONE APPROACH TO LARGE SCALE COMPREHENSIVE RESOURCE PLANNING FROM 1978 TO 1986.

For close to ten years, the author has prepared large-scale comprehensive cultural-resource plans and observed their use and evolution. This paper describes the overview of the Green Mountain National Forest in Vermont, probably the first use of the RP3 concept after its development; comprehensive management plans for sections of the Outer Continental Shelf; management guidelines and interpretive recommendations for the Massachusetts Park and Forest System, including new approaches to interpretation and public education; and the resource protection plan for the Commonwealth of the Northern Marianas, which integrates traditional cultural values into the planning process. (54)

*Robinson, E.J. (see Beaudry, M.P.)*(57)

*Robinson, R.W. (Antelope Valley)*

#### HACHA: A LATE INITIAL PERIOD SITE ON THE SOUTH COAST OF PERU.

Research over the past three years in the Acari Valley on the south coast of Peru has yielded significant data bearing on the question of cultural development in the late Initial Period. Survey and limited test excavation at the Hacha site have answered some questions and raised many others in regard to this early settlement. Recent radio-carbon dates are presented as are data concerning architecture, ceramics, and mortuary practices. Earlier thinking on this well known archaeological site is reexamined in light of these new data.(49)

*Rocek, Thomas R. (Oregon State University)*

#### ECONOMY, DEMOGRAPHY, AND SOCIAL CHANGE: THE NAVAJO OF NORTHERN BLACK MESA.

The archaeological record of Navajo settlement on northern Black Mesa, Arizona, is used to examine the relationship of change in social organization, with demographic and economic conditions. Population and economy are monitored using dwelling and livestock structure data. Cluster, nearest

neighbor, and quadrant analytic measures are used to assess changes in settlement patterns. Results suggest that inter-residence aggregation and decreased residence unit size accompany growth of a pastoral economy. Rising population and wage economy growth correlate with inter-residence dispersion. These settlement shifts are linked to changes in ethnographically known cooperative social units.(51)

*Roe, Peter G. (Delaware) and Peter E. Siegel (SUNY, Binghamton)*

#### VILLAGE SPATIAL ORGANIZATION IN THE SOUTH AMERINDIAN LOWLANDS: EVIDENCE FROM ETHNOARCHAEOLOGY.

Archaeologists are increasingly interested in the dynamics of intra-settlement spatial organization as well as the total site context. This paper employs a combination of ethnographic, ethnoarchaeological, and archaeological data to gauge changing settlement organization within the South American tropical rain forest. A comparative approach, involving different societies of disparate adaptations within related, but distinct, ecotones is utilized to develop two models of village and circum-village spatial organization as well as to document a shift from the first to the second in response to raiding. The possibility of change between the models supports an over-arching "meta-model" of the organization of space in the lowlands.(27)

*Rogers, J. Daniel (School of American Research)*

#### THE SOCIAL ROLE OF COMMODITIES: AN ARCHAEOLOGY OF ARIKARA TRADE.

In the early historic period the Arikara, a horticultural group in South Dakota, participated in an international trading system dealing in furs and other commodities. With the advent of the fur trade and its special brand of economics and interaction, Arikara modes of artifact preference and usage acquired new dimensions not completely like any previous system. Within the framework of contact, there were transformations of the dialectic of interaction. The changing composition of artifact assemblages from excavated Arikara sites suggests a complex set of interactions associated with the selective adoption or rejection of Euro-American trade goods.(40)

*Rollins, Harold B. (Pittsburgh), Daniel H. Sandweiss (Cornell), Judith C. Rollins (Pittsburgh) and Uwe Brand (Brock, Ontario)*

#### RECOGNITION OF LARGE MAGNITUDE EL NIÑO EVENTS USING ANDEAN COASTAL SHELL MIDDENS.

Growth increment, stable isotope, and distributional analyses of molluscan shells following the 1982-1983 El Niño provide a datum for documentation of "mega"-El Niño events using mollusks obtained from coastal archaeological sites. El Niño recognition criteria include (1) valve margin profiles (2) stable isotope ratios along shell profiles (3) transgressive crossed-lamellar shell microstructure and (4) latitudinal displacement of stenotopic taxa. The existing El Niño pattern possibly originated about 5,000 years B.P. all known pre-5,000 year B.P. shell middens north of about 9° south latitude contain warm-water molluscan associations.(6)

*Rollins, H.B. (see Sandweiss, D.H.)*(6)

*Rollins, J.C. (see Rollins, H.B.)*(6)

*Romanski, E.J. (see Prentice, W.C.)*(56)

*Ruffini, Franco (Ohio Historical Society) and Paul Hooge (Licking County Archaeological and Landmark Society)*

#### PUBLIC EDUCATION: A POSITIVE APPROACH TO THE ARTIFACT TRAFFICKING PROBLEM.

The problem of artifact trafficking is seen as a manifestation of a larger problem, i.e., the public's lack of knowledge and appreciation of archaeological resources. A Licking County, Ohio group provides an example of how this problem may be addressed within a larger context. A multi-faceted approach involving local constituency building, providing public education and research opportunities, promoting archaeology through travel and tourism, conducting surveys, monitoring threatened sites and assisting in data recovery from sites being destroyed is used to heighten public awareness of the problem. Of particular note is the production of several video cassettes, including the one featured today entitled: Ethics in Archaeology: Conflicts in Collecting.(2)

*Sabloff, J.A. (40)*

*Sackett, James (UCLA)*

#### BEYOND TIME-PLACE SYSTEMATICS IN ROCK ART RESEARCH: A SYNTHETIC VIEW.

Traditional approaches to rock art study have emphasized the definition of rock art "styles" and chronologies, resulting in cultural-historical frameworks but little in the way of anthropological

inference, while "interpretation" of meaning has been left to the realm of the avocationalist or fringe researchers. While the time-place systematics studies made their contributions to general cultural history, this approach has left the study of parietal art up against a paradigmatic wall with no method nor technique for further interpretation nor inference. The new approaches to interpretation, running the gamut from formalist quantitative studies, in contexts lacking ethnography, to ethnographic studies using informants to provide the context and meaning of historic rock art sites, are assessed and their utilities and applicabilities reviewed.(38)

*Salzer, Robert J. (Beloit College)*

**CULTURAL AND TEMPORAL CONTEXTS OF THE GOTTSCHALL ROCK ART SITE.**

Excavations at a recently-discovered rockshelter in southwestern Wisconsin have provided stratigraphic and artifactual associations, radiocarbon dates, and evidence of at least two different patterns of use associated with portions of a group of more than forty anthropomorphic, zoomorphic, and unidentified painted figures. Enhancement of the paintings using infrared and ultraviolet spectral ranges and computers has revealed details that indicate that several art styles are present, implying that the paintings were done at different times. One composition of four figures exhibits motifs that reflect aspects of Mississippian and Caddoan ideologies, as well as indicating ties with Ioway and Winnebago oral traditions.(35)

*Sanders, W.T. (11)*

*Sanders, W.T. (42)*

*Sandweiss, Daniel H. (Cornell), Harold B. Rollins (Pittsburgh) and James B. Richardson III (Pittsburgh)*

**GEOARCHAEOLOGY OF THE SANTA/CHAO REGION, NORTHERN PERU: ALTERATIONS IN LANDSCAPE, CLIMATE, AND HUMAN OCCUPATIONS.**

In the Santa/Chao region of the Peruvian north coast, several interacting geomorphic and climatic factors have been observed in association with prehistoric human occupations. The coast has prograded by circa 5 km in the past 5000 years due to tectonic uplift and beach ridge formation. The beach ridges which emanate from the mouth of the Santa River may record flooding episodes associated with major prehistoric El Niños. Nearby middens associated with a fossil beach date to 5000 B.P. and have a worm-water fauna. These changes in the topography and climate of the Santa/Chao area caused significant alterations in the prehistoric settlement patterns and resource utilization.(6)

*Sandweiss, D.H. (see Rollins, H.B.)(6)*

*Santley, Robert S. (New Mexico)*

**TEOTIHUACAN INFLUENCE AT MATACAPAN: ALTERNATIVE MODELS AND INADEQUATE EXPLANATORY FRAMEWORKS.**

Matacapan is one site with an archaeological record strongly influenced by Teotihuacan. Explanations of that influence have ranged from participation in a Teotihuacan interaction sphere to the presence of a Teotihuacan enclave, a port-of-trade, and direct military conquest. This paper summarizes the evidence for Teotihuacan contact and influence at Matacapan. Special attention is paid to variation in the spatio-temporal patterning of Teotihuacan-style materials. The adequacy of that data base, or data bases like it, for testing various competing models of Teotihuacan influence is then explored and some suggestions for future research offered.(11)

*Santley, R.S. (see Pool, C.A.)(40)*

*Santoro, Calogero M. (Cornell, Ithaca)*

**TRANSHUMANCE PATTERNS IN THE SOUTH CENTRAL ANDES.**

The study of patterns of transhumance in the South Central Andes - southern Peru, northern Chile, and northwestern Argentina - has led to the discovery of several different expressions adapted to "micro-ecological zones". One, a case with less seasonal emphasis, focuses on hunting in the highland "dry puna" niche. This contrasts with a more seasonal model of the "desert puna" with emphasis on hunting and gathering, centered along the incised pre-cordilleran valleys. Both basic patterns are still in practice in the *Aymara* annual cycles of pastoralism. (Illustrative materials are provided).(49)

*Sanzentea, R. (see Brockington, D.L.)(49)*

*Saunders, L.P. (see Sempowski, M.L.)(36)*

*Savelle, James M. (Cambridge)*

**COLLECTORS TO FORAGERS: SUBSISTENCE-SETTLEMENT SYSTEM CHANGE AMONGST ARCTIC HUNTER-GATHERERS.**

Recent surveys and excavations in the central Canadian Arctic indicate substantial changes in Thule Eskimo site type frequencies, regional and local site distributions, and faunal characteristics

from the 'classic' Thule Eskimo period (ca. A.D. 1000-1400) to the 'modified' Thule-historic Eskimo period (ca. A.D. 1400-1900). These changes are shown to correspond to a shift from a subsistence-settlement system based on collecting strategies (sensu Binford) to one based on foraging strategies, and are seen as a response to a decrease in the predictability and abundance of both bowhead whales and barren ground caribou resulting from deteriorating climatic conditions.(12)

*Schiffer, M.B. (27)*

*Schiffer, M.B. (44)*

*Schiffer, M.B. (see Skibo, J.M.)(50)*

*Schild, R. (see Wendorf, E.)(20)*

*Schmider, B. (see Audouze, E.)(20)*

*Schneider, Jane (Graduate Center, CUNY)*

**WARP, WEFT, PATTERN AND HUE: AESTHETIC ISSUES IN THE INTERACTION OF LUXURY CLOTH TRADITIONS.**

Luxury cloth traditions mobilize labor, materials, capital and ideas to produce fabrics of aesthetic reputation that, historically, participated in the formation and interaction of polities. Awesome indices of rank, spectacular accessories to ritual, coveted gifts for exacting and rewarding loyalty, luxury cloths also enhanced diplomatic missions and earned foreign exchange. Power holders, however, had to worry that the cloths on which they relied for these purposes would be upstaged by rival fabrics, whose production and distribution were beyond their control. In considering this problem, it helps to identify the parameters that drove interacting cloth makers in particular aesthetic directions as they rivaled each other in creating luxury cloth.(8)

*Schoeninger, M.J. (see Knecht, P.)(7)*

*Schoeninger, M.J. (see Moore, K.M.)(49)*

*Schoeninger, M.J. (see Murray, M.L.)(48)*

*Schoeninger, M.J. (see Spielmann, K.)(1)*

*Schoenwetter, James (Arizona State, Tempe)*

**THE LOGIC OF ARCHAEOLOGICAL POLLEN ANALYSIS.**

Pollen of sediment samples from archaeological sites has the same botanical and statistical characteristics as the pollen of other deposits, so is traditionally interpreted by the same logical operations that apply to biological inclusions in geological strata. One can argue, however, that these qualities of site-context pollen spectra are less significant than their archaeological characteristics of context and direct and indirect association with artifactual information. Archaeological pollen analysis accepts this argument and proceeds to the conclusion that site-context pollen spectra should logically be treated as arrays of archaeological data. Archaeological pollen analysis also recognizes a continuous, systemic relationship between cultural activities and the biological context in which they are embedded.(43)

*Schortman, Edward M. (Kenyon)*

**DIFFUSION VS. EVOLUTION: AN OLD DEBATE AND A CURRENT PROBLEM.**

Recent efforts to model processes of intersocietal interaction are hampered by a persistent debate in anthropology. This controversy poses two unrealistically simple alternatives to explaining social change: either as the result of contact with other societies (diffusion) or adaptation to the physical environment (evolution). Related issues concern questions of the primacy of historical accident or behavioral laws in governing processes of change. The present paper explores the development of this debate in the mid-20th century and considers its implications for current studies of the relationship between intersocietal contact and local social change.(8)

*Schreiber, Katharina J. (UC Santa Barbara)*

**THE INKA OCCUPATION OF THE PROVINCE OF LUCANAS, PERU.**

An archaeological survey of the territory of the Andamarca Lucanas yields evidence of the Inka occupation of the province of Lucanas. The Inka occupation may be distinguished archaeologically from the pre-Inka local culture on the basis of changes in settlement patterns, intervalley road networks, styles of architecture, and ceramics. Ethnohistoric documents are used to provide details not visible archaeologically; the archaeological data suggest that in some respects the ethnohistoric documents are not entirely accurate.(41)

*Schroeder, H. Bruce (Toronto)*

**PROBLEMS AND PROSPECTS FOR RESEARCH INTO THE LATER ARCHAIC OF SOUTHERN ONTARIO.**

In their investigations into the 10,000 year prehistory of southern Ontario, archaeologists have largely bypassed the Archaic for the historical richness of the Late Woodland or the temporal priority of the Paleo-Indian period. In contrast to the abundance and ubiquity of Archaic (surface) finds, the poverty of research into the Archaic is striking. This has been due partly to data limitations, perceived and actual, but more importantly to the absence of clearly defined research objectives. Recent publications plus personal experience through test excavations at two promising locations have served to highlight this contradiction. This paper will attempt to resolve this dilemma by suggesting realistic research directions appropriate to data of the Archaic.(33)

*Sempowski, M.L., L.P. Saunders and G.C. Cervone (RMSC)*

**THE EARLY HISTORIC SENECA: SETTLEMENT PATTERNS AND DEMOGRAPHIC TRENDS.**

Artifactual, osteological and mortuary evidence from several early Seneca sites is examined for its potential to provide insights into Seneca settlement patterns. The study is based on the extensive collection of materials currently under investigation by the members of the Seneca Archaeology Project at the Rochester Museum. Issues considered here include the substantial population increase and consolidation of the late 16th century and the processes underlying it. Concerning the composition of the Seneca population, tentative conclusions are offered regarding local precursor populations; interaction and affiliation with neighboring Iroquoian groups; and the possible assimilation of war captives.(36)

*Shackel, Paul A. (SUNY, Buffalo)*

**THE ARCHAEOLOGY OF MANNERS.**

This paper will examine the development of manners and the material culture associated with them from the late Medieval times in Europe to early nineteenth century Annapolis, Maryland. Civility, as it was known in the eighteenth century, was considered by philosophers, such as Voltaire, to be embedded in nature. The emergence of this world view led to an increasingly stratified society which used fine-tuned signals of behavior and the consumption of different types and amounts of material culture to maintain social segmentation between classes while still creating a common denominator of standardized behaviors. This research is grounded in an extensive survey of courtesy and etiquette literature, probate inventories, and the archaeological record from Annapolis, Maryland.(29)

*Shofer, Harry J. (Texas A&M) and Patricia A. McAnany (Cincinnati)*

**PATTERNS OF PRODUCTION AND CONSUMPTION: A STONE TOOL EXCHANGE NETWORK FROM THE EASTERN MAYA LOWLANDS.**

Throughout the Late Preclassic and Classic periods a system of interpolity stone tool exchange operated in the eastern portion of the Maya Lowlands. Substantive data from the tool-producing community of Colha and the tool-consuming communities around Pulltrouser Swamp are presented. The organization of this specialized production is characterized as is the role of Colha in a regional settlement hierarchy. The consumer role of Pulltrouser Swamp is documented using settlement and lithic data. The structure and stability of this interpolity exchange network are discussed.(40)

*Shaffer, Gary D. (Louis Berger & Associates)*

**SANITIZED FOR YOUR PROTECTION: ON THE ROAD WITH FEDERAL AND STATE ARCHAEOLOGY.**

Implementation of the National Archaeological Data Base Project in 14 states is described. The project, sponsored by the National Park Service and designed to provide a planning tool for federal agencies, necessitated many months of data acquisition in State Historic Preservation Offices. Personal recording of over 8000 cultural resource reports in the computerized, annotated bibliography provided a unique perspective on the evolution of contract archaeology in the United States. The success of compliance archaeology is considered in the light of economic constraints and the call to problem-oriented research.(54)

*Shaffer, M.R. (see Vitelli, K.D.)(50)*

*Sharp, Nancy D. (Washington, Seattle)*

**RESOURCE SELECTION IN DEVELOPING AGRICULTURAL SYSTEMS.**

Increased dependence on maize agriculture is often linked to decreases in both abundance and diversity of faunal resources exploited by prehistoric groups in the Greater Southwest. However, an alternative model of resource selection predicts equal or even expanded use of nondomesticated faunal

and floral resources as domesticates are added to the subsistence system. Analysis of resource exploitation at Nawthis Village in central Utah, and comparison of subsistence data from selected Fremont and Anasazi sites, are used to test these alternative models. Results suggest a reevaluation of the impact of agricultural expansion north of the Anasazi.(51)

*Sheeham, Glenn W. (Bryn Mawr)*

**ACCENTUATION OF INEQUALITY IN ESKIMO WHALING SOCIETIES DURING EARLY CONTACT.**

A native economy based upon whale hunting led to a hierarchical social system during the recent prehistoric period on the Arctic coast of Alaska. Coastal Eskimo villages of up to 1300 people were politically and religiously organized by *umialiks* (whaling captains) who operated out of *karigis* (ceremonial centers) that they owned. Less important *umialiks* did not have *karigis*, but every whaling captain was responsible for feeding the members of his whaling crew and their families, and all participated to some extent in feeding the community in general. Native inequality was accentuated during the early contact period, as *umialiks* traded baleen for Western goods.(58)

*Sheehy, James J. (Penn State)*

**ETHNOGRAPHIC ANALOGY AND THE COPANECO ROYAL HOUSEHOLD.**

Ethnographic descriptions relating to the internal differentiation of structure and function within palaces and royal households in various societies in Africa, Southeast Asia, the Pacific and the Americas are compared. The comparative data form the basis for generating a composite model of palaces and royal households in chiefdom and state-level societies. The model is then employed to interpret the archaeological data pertaining to the Main Group of Copan, the presumed royal household at this Late Classic Maya center in western Honduras.(45)

*Sheets, Payson D. (Colorado, Boulder)*

**ECONOMIES OF DEPENDENCY OR SELF-SUFFICIENCY IN EL SALVADOR AND COSTA RICA.**

The largely egalitarian societies of Costa Rica, with their low population densities, contrast with the more complex Salvadoran societies with greater population densities and instabilities. Costa Rican villages achieved relative independence in productive and extractive resources. In contrast, Salvadoran villages fell under dependency relationships, having to rely on exchange for distant, needed commodities. Intra-settlement specialization resulted in lesser familial self-sufficiency. Differing exchange systems have significant implications for societal longevity.(40)

*Sheppard, Peter (Waterloo), L.A. Pavlish (Toronto) and R.G.V. Hancock (Toronto)*

**SOURCING OF EARLY NEOLITHIC AND MESOLITHIC CHERTS AND RHYOLITES FROM SOUTHERN PORTUGAL.**

As part of a joint Portuguese/Canadian research project on the Mesolithic/Neolithic transition in Southern Portugal, a programme of lithic raw material sourcing using INAA and petrographic analysis has been established. The raw materials from three Early Neolithic/Mesolithic sites and two geological sources have been analyzed. Results of this preliminary work have shown that rhyolites as well as cherts were extensively used by coastal hunter-gatherers in the production of microlithic tool kits. The study of geological materials has demonstrated that the rhyolite is found 20 km inland. This information may provide support for seasonal movement of coastal populations.(16)

*Shimada, Izumi and John Merkel (Harvard)*

**SICAN METALLURGY: "HOLISTIC" UNDERSTANDING AND THE ROLE OF ARCHAEOLOGY.**

Nine years' research has yielded perhaps the most comprehensive, integrated picture of any ancient technological system in the New World - that of the Sicán copper alloy metallurgy (A.D. 850-1532) of the northern Peruvian coast. Our "holistic" understanding encompasses technological, behavioral, organizational, and ideological aspects of mining, smelting, metalworking, and the use and distribution of final products. Data derive from an interdisciplinary approach incorporating field experiments utilizing local materials, reconstructed and original furnaces, and complementary archaeometric techniques. From the vantage of such a unique perspective, extant views on "culture and technology" and the role of archaeometry in archaeology are assessed.(32)

*Shimada, I. (see Cleland, K.M.)(39)*

*Shott, Michael (U.S. Army Corps of Engineers, Detroit)*

**TECHNOLOGICAL ORGANIZATION IN GREAT LAKES PALEO-INDIAN ASSEMBLAGES.**

Lithic assemblages were crafted for task performance, but their form and content reflect other cultural behavior as well. Stone tools, in short, tell us about more than how stone tools were made

and used. This premise underlies organizational analyses, which infer nonmaterial aspects of cultural systems (e.g., mobility, the way in which risk is distributed socially) from sparse material remains. Study of Gainey and Parkhill Phase Paleo-Indian sites in the Great Lakes demonstrates the value of an organizational approach to the inference of mobility. Technological indices—diversity, versatility, curation rate—are related systematically to mobility among these groups.(46)

**Siemens, Alfred H. (UBC, Vancouver)**  
**MANIPULATION OF SOIL AND WATER IN THE XERIC ENVIRONMENTS OF LOWLAND EL ORO, ECUADOR.**

Past resource use is under investigation south of the Guayas estuary (El Tahuin Project). Agriculture in periodically inundated depressions has a long history. Air photo analysis, ground reconnaissance and test excavations indicate related or antecedent expedients. Hundreds of previously undocumented and apparently artificial shallow circular depressions dot the Tertiary sediments between stream valleys. Removal of sandy topsoil exposes clay; the resulting pans retain open water long after the rains, favor useful plants and attract deer. They promise a new perspective on ancient subsistence in coastal Ecuador.(28)

*Siegel, P.E. (see Bernstein, D.J.)*(37)

*Siegel, P.E. (see Roe, P.G.)*(27)

**Silverman, Helaine (Illinois, Urbana)**  
**IS NASCA 8 NASCA?**

Although the Nasca ceramic style of the south coast of Peru is seriated into nine phases, the penultimate phase, Nasca 8, exhibits so many discontinuities with the previous phases and so many foreign attributes as to make its current style designation a misnomer. The Nasca 8 loss of important and diagnostic Nasca vessel shapes, demise of mythical iconography, and notable technological decline are explained in terms of dramatic changes in the sociopolitical milieu of the Nasca region. These both coincide with the rise of the Wari state in the adjacent Ayacucho highlands and emerge out of the increased militarization, hierarchization, and economic expansion of late Nasca society. The Nasca 8 relative and absolute chronology are discussed and the iconography of the phase is illustrated. The possible causes of the ritual entombment of a temple room at the early Nasca site of Cahuachi by Nasca 8 people are assessed.(13)

**Simek, Jan E. (Tennessee) and Jean-Philippe Rigaud (DAPA, Bordeaux)**  
**SITE FORMATION AT THE ABRI VAUFREY (DORDOGNE, FRANCE).**

Recent analyses of spatial patterns, along with studies of artifacts, faunal materials, and sediments, show a complex set of factors leading to the formation of couche VIII (Mousterian) from the Abri Vaufréy. It is evident that both humans and non-human predators contributed to the patterning observed to differing degrees; the precise contribution of each agent is the focus of spatial analysis. Based on analyses of spatial cluster contents, it is argued that while non-human predators scavenged the deposit, humans were the primary agents producing observed spatial configurations.(44)

*Simek, J.E. (see Rigaud, J-P)*(20)

**Simmons, Alan H. (Desert Research Institute)**  
**THE 'AIN GHAZAL COMMUNITY STUDY: PRELIMINARY RESULTS OF AN ARCHAEOLOGICAL AND GEOMORPHIC SURVEY NEAR AMMAN, JORDAN.**

The first campaign of excavations at 'Ain Ghazal, near Amman, Jordan, has revealed it to be one of the largest and most significant neolithic villages in the Near East. Investigations to date have focused primarily on the site itself, and have yielded tremendous amounts of new data on neolithic life. However, we know little of the surrounding area in terms of settlement and land-use patterns. A reconnaissance survey was recently undertaken in an attempt to define the broad outlines of an 'Ain Ghazal community. This paper discusses the survey findings and their implications for settlement at 'Ain Ghazal.(3)

*Simmons, A. (see Mandel, R.)*(3)

*Singer, C. (see Ericson, J.E.)*(40)

**Skibo, James M. and Michael B. Schiffer (Arizona, Tucson)**  
**ORGANIC-TEMPERED POTTERY: AN EXPERIMENTAL STUDY.**

The hypothesis, suggested by Kenneth Reid, regarding the susceptibility of organic-tempered pottery to breakdown by freeze-thaw processes is tested. In addition, the results of testing technological and technofunctional hypotheses (offered by Reid and others), also concerning the effects of organic

temper, are presented. This study made use of materials science techniques to compare the performance characteristics of untempered, mineral, and organic-tempered briquettes and vessels. Among the properties tested are impact resistance, abrasion resistance, portability, thermal shock resistance, and heating effectiveness. Organic-tempered ceramics are superior in portability and this may explain the preference for such pots by nonsedentary peoples. Moreover, it is found that all low-fired ceramics, but especially organic-tempered ceramics are susceptible to complete breakdown in a moist environment under freezing conditions. Frost-wedging is not only thought to be responsible for an underestimation of Late Archaic organic-tempered ceramics in the northern latitudes, but also the destruction of any low-fired pottery subject to a moist depositional environment and freezing temperatures.(50)

*Skinner, S.M. (see Wojtala, J.)*(18)

**Sleeter, Richard S. (New Mexico State)**  
**EXPLORATION OF CULTURAL INTERACTION: A STUDY OF SETTLEMENT PATTERNS IN THE GALLINA REGION OF NORTHWESTERN NEW MEXICO.**

Traditionally, researchers have written about cultural interaction while utilizing very little cumulative data from areal syntheses. The use of locational analytical techniques on large data sets is more likely to result in accurate interpretations of cultural interaction. In this paper, these analytical techniques will be utilized to explore settlement patterns and cultural interaction.(34)

*Slota, P.J., Jr. (see Taylor, R.E.)*(23)

*Smeaton, J.E. (see Wilson Yang, K.M.)*(43)

**Smiley, E.E. (Southern Illinois, Carbondale)**  
**OLD WOOD AND EARLY AGRICULTURE IN NORTHEASTERN ARIZONA: APPROACHES TO THE INTERPRETATION OF RADIOCARBON DATES.**

In radiocarbon dating, the potential disparity between the age of wood and an archaeologically linked cultural event is greater than any source of error but contamination. This study examines the effects of age disparity on the interpretation of a large suite of radiocarbon dates from Black Mesa Basketmaker II sites. An investigation of the distribution of wood age on Black Mesa historic-period Navajo sites provides quantitative control of age-overestimation factors. Finally, the paper discusses the impacts of such factors on prehistoric chronometry, particularly that of the early agricultural occupation of Black Mesa.(23)

**Smith, Beverley A. (Michigan State)**  
**DOG BURIALS OF LATE PREHISTORIC ALGONQUIAN SITES IN NORTHEASTERN ONTARIO.**

Dog burials have been excavated from three major archaeological sites in northeastern Ontario. These sites, Whitefish Island, Providence Bay, and Frank Bay, fall within the historic homelands of the Saulteaux (Ojibwa), Odawa (Ottawa), and Nipissing respectively. All dog skeletons produced cut marks on the cervical vertebrae but the burials do differ in other respects. Osteometric analysis of the dog individuals, circumstances of interment, and ethnohistoric and ethnographic data are presented to demonstrate the similarities and differences among these groups with respect to their ritual treatment of dogs.(25)

*Smith, D.G. (see Finlayson, W.D.)*(36)

**Smith, Edward E. (Indiana, Bloomington)**  
**SWAN'S LANDING SITE: A STRATIFIED SINGLE COMPONENT KIRK MANUFACTURING SITE IN HARRISON COUNTY, INDIANA.**

The Swan's Landing site (12Hr304) is a deeply buried, stratified single component lithic reduction and tool manufacturing site located in the out bank of the Ohio River. The site is buried beneath 4-6m of sterile Holocene overbank alluvium. Projectile points recovered from stratified context are exclusively variants of Kirk Corner Notched, Small Variety. The site is closely associated with exposures of high quality cryptocrystalline Wyandotte chert. The site appears to be a major locale for tool discard and replacement. Virtually the entire tool assemblage of the early Kirk period is represented in the deposits.(56)

*Smith, H.A. (see Guderjan, T.H.)*(47)

**Smith, Marvin T. (Garrow & Associates)**  
**EARLY HISTORIC PERIOD TRADE IN THE INTERIOR SOUTHEAST.**

Mechanisms of the introduction of European artifacts into the Ridge and Valley Province of Georgia, Alabama, and Tennessee before AD 1670 are explored. These mechanisms include direct trade by

European explorers such as Hernando de Soto and Juan Pardo, indirect trade from aboriginal group to aboriginal group, and long distance aboriginal trade. Direct trade by Europeans is important only during the sixteenth century. The abundance of European goods found on early seventeenth century sites indicates that aboriginal exchange systems were still in operation although political systems and population were collapsing following contact.(40)

*Smith, Michael E. (Loyola)*

**COMMUNITY ORGANIZATION AT TWO LATE POSTCLASSIC SITES IN MORELOS, MEXICO.**

This paper presents new data on community organization at two Aztec period settlements in western Morelos, Mexico. Extensive excavations were conducted in 1986 by the Postclassic Morelos Archaeological Project at the village site of Capilco and the town site of Cuexcomate. Fieldwork involved a combination of complete house excavations, limited testing of a random sample of houses, and horizontal clearing of other houses and non-residential structures. Preliminary results discussed here include information on the functions of structures, spatial patterning within and around settlements, household economics (production and exchange activities, wealth levels), and agricultural technology. Comparisons are made between the two sites.(30)

*Smith, M.E. (see Bishop, C.A.)(58)*

*Smyth, Michael P. (New Mexico)*

**SITE STRUCTURE AND SPATIAL ORGANIZATION: THE ARCHAEOLOGY OF STORAGE BEHAVIOR.**

Archaeologists have generally recognized the important role of storage in the development of complex societies. Despite this acknowledgement, archaeological identification of storage, especially at the domestic level, has remained problematic. Current ethnoarchaeological research on spatial usage and domestic storage behavior in Yucatan has revealed patterned material relationships between household structure and spatial and scheduling requirements of storage activities. These data are used not only to suggest new directions for recognizing storage, but also to provide a means to monitor status differences and agricultural intensity.(27)

*Snow, Dean R. (SUNY, Albany)*

**VARIABLES AND CONSTANTS IN IROQUOIAN SETTLEMENT PATTERNS.**

Mohawk Iroquois longhouse villages provide an archaeological basis for measuring populations and their change over time. Constants that have been defined through the use of documentary and archaeological evidence include longhouse compartment dimensions, average family size, village area to population ratios, warrior to population ratio, catchment size, and hectares per person under cultivation. Variables include length of village occupation, village population size, longhouse length, migration, and occupation dates. The definition of constants and our increasing control of variables has allowed the development of an algorithm for plotting gross Mohawk demographic change over time.(36)

*Soffer, Olga (Illinois, Urbana)*

**HUNTER-GATHERERS ON THE RUSSIAN PLAIN AT 18,000 B.P.**

Over a hundred years of archaeological research and a large number of recently obtained radiocarbon dates indicate that the Russian Plain was 1) extensively inhabited during the Valdai glacial maximum, and that 2) groups clustered in distinct regions. Sparse occupation is documented for both the Molodova (Dnestr) and the Kostenki-Borschevo (Don) regions. More numerous sites are known from the Dnepr/Desna region on the central part of the plain. The extent of occupation in the southern steppe region and in Crimea remains uncertain. This paper documents the loci of human occupation and examines reasons for the disparate records from the different regions.(20)

*Spielmann, Katherine (Iowa, Iowa City), Margaret J. Schoeninger (Harvard) and Katherine Moore (Harvard and Michigan, Ann Arbor)*

**HUMAN DIET AT PECOS PUEBLO.**

Between AD 1450 and 1600, the agriculturalists at Pecos exchanged corn for bison meat with Plains dwelling hunter-gatherers. Analysis of bone strontium levels and carbon and nitrogen stable isotope ratios of bone collagen indicate that the meat:vegetable and corn:non-corn ratios of diet were relatively stable throughout this period. The delta-15N values of human bone collagen and of diet components (corn, beans, bison) suggest that in terms of calories, the diet was 75% corn, 15% beans, and 10% meat. A check using the delta-13C values supports this estimation. This diet should have been adequate in protein and other required nutrients.(7)

*Spiess, Arthur E. (Maine Historic Preservation Commission), Deborah Brush (Maine Historic Preservation Commission) and John R. Grimes (Peabody Museum, Salem)*

**PATTERNING IN PALEOINDIAN BEHAVIOR: THE MICHAUD SITE.**

The Michaud site is a completely excavated, short-term fluted-point Paleoindian site preserving 8 minimally disturbed activity loci. Dominant raw materials are red Munsungun cherts from northern Maine, a glassy rhyolite apparently from the Neponset river basin south of Boston, and a series of cherts from sources south of Burlington, Vermont. Two types of chert dominate in one group of 3 loci, and the Neponset rhyolite dominates the other 5. Each group of loci exhibits spatial patterning differences which indicate differences in social organization of the inhabitants. Reconstructions of tool curation and manufacturing strategy have been elicited by flake examination and refitting. These data suggest variable Paleoindian movement patterns between the widely separated lithic source areas, and a number of socially differing adaptations to short or long term temporally varying resources.(46)

*Spurling, Geoffrey E. (Cornell and AMNH)*

**QOLLA POTTERS MAKING INKA POTTERY: CERAMIC PRODUCTION AT MILLIRAYA.**

This paper summarizes ethnohistoric and archaeological research conducted at Milliraya, located to the north of Lake Titicaca, within the Qolla region. Sixteenth-century land litigation records reveal that the Inka established an artisan settlement at Milliraya, recruiting 1,000 weavers and 100 potters from the surrounding area. The analysis presented focuses on interpreting surface collected material from Milliraya within the context of information, derived from archival sources, on the organization and administration of production. Particular stress is placed on 1) the archaeological visibility of ceramic production, and 2) the combination of Inka and local-altiplano stylistic elements and vessel forms.(41)

*Stahl, Peter W. (London) and James A. Zeidler (ESPOL, Guayaquil/ Pittsburgh)*

**SPATIAL ANALYSIS AND TAPHONOMY OF VERTEBRATE FAUNA FROM EARLY FORMATIVE DOMESTIC STRUCTURES AT REAL ALTO, ECUADOR.**

The spatial distribution of three variables recorded for vertebrate faunal remains from a domestic structure at Real Alto, Ecuador, is examined to assess a proposed contextual reconstruction of Early Formative household space. The differential patterning of size, density, and weight classes, in the face of a number of identifiable and/or potential taphonomic agents, suggests a biased distribution of bone survivorship which correlates well with expectations based upon a reconstruction derived from non-faunal remains.(34)

*Staller, John E. (Southern Methodist)*

**A CONTEXTUAL ANALYSIS OF A VALDIVIA HOUSE STRUCTURE AT OGSE-CH- 150.**

The Early Formative (3400-1500 B.C.) Valdivia site of OGSE-CH-150 is located in the Rio Verde Drainage about 12 km north of Real Alto. Excavations of a portion of a house structure and associated burial indicate that sherd materials found below the surface do not represent the accumulation of habitation debris, but rather are the result of a single episodic event involving house construction and household burial. The consequences of such activities for site formation processes and ceramic seriation in Valdivia sites are discussed.(28)

*Stanish, Charles (Illinois, Chicago)*

**SIZE AND COMPLEXITY IN CORE AREA TIWANAKU SETTLEMENTS.**

The nature of core area Tiwanaku sites remains obscure due largely to a lack of regional settlement data and a prior research focus on civic-ceremonial architecture. This paper utilizes data from two major Tiwanaku IV and V period sites, Lukurmata and Pajchiri. Both sites include residential and non-residential areas greater than 1.5 km<sup>2</sup> with dense concentrations of elite and non-elite domestic occupations near the ceremonial center, as well as along peripheral, raised field agricultural zones. Utilizing intensive surface survey and mapping data, this paper assesses existing models of Tiwanaku settlement size and complexity, and proposes two refined models for the southern Titicaca basin.(52)

*Stein, J.K. (see Dalan, R.A.)(43)*

*Steponaitis, Laurie Cameron (SUNY, Binghamton)*

**DECLINING RESIDENTIAL MOBILITY IN THE LOWER PATUXENT DRAINAGE, MARYLAND.**

Regional survey data are used to investigate the transition from mobile to sedentary lifeways in coastal Maryland between 4000 B.C. and A.D. 1600. The evidence suggests that Late Archaic and Early Woodland populations were small and fairly mobile. It was not until the Middle Woodland that several changes took place that may indicate greater sedentism and a shift to "logistical" resource procurement. These are: (1) pronounced functional differentiation among tool assemblages, (2) an increase in the relative frequency of "special-purpose" sites; and (3) an increase in artifact density

within sites. Although the reasons for this apparent decline in mobility are not fully understood, the intensification of alliance networks, evidenced by a tremendous increase in lithic exchange, may have created a need for storage facilities, which in turn would have provided an incentive for greater residential permanence.(12)

*Stevenson, Christopher M. (New Mexico State)*

#### METHODS OF OBSIDIAN HYDRATION RIM ENHANCEMENT AND MEASUREMENT.

The basic phenomena behind the obsidian hydration dating technique are presented. The current optical techniques used in the identification, enhancement, and measurement of the hydration rim are demonstrated. The decision making process used by the operator to handle problematic samples is also discussed.(53)

*Stevenson, Marc G. (Alberta)*

#### WHAT NOW! BEYOND THE FORMATION OF HEARTH ASSOCIATED LITHIC DISTRIBUTIONS.

Much current dissatisfaction with processual archaeology has risen in response to our inability to forge linkages between middle range theory and general theories of human behaviour and organization. Employing site formation theory, this paper explores a small part of the inferential potential of lithic distributions around intensively utilized hearths. Assuming that size sorting, embedding, and edge damage in such contexts are time dependent, the potential of such lithic distributions to illuminate changes through time in resource exploitation and gender relationships is examined. Although the middle range and general theories presented here are in their infancy, this paper demonstrates that the New archaeology is not dead, only harder than we imagined.(44)

*St. George, Robert Blair (Boston)*

#### HUMAN HOUSES IN EARLY NEW ENGLAND: CONNECTIONS BETWEEN ARCHITECTURE AND LITERATURE.

In order to decode the meaning of apparently "simple" artifacts like domestic buildings in seventeenth-century New England culture, they must be read alongside the poetry and sermons of the period. This paper explores the use of architectural metaphors in seventeenth-century literature, and argues that by symbolically projecting the human body into architectural form, people created a metaphysical landscape that both tested and intensified their beliefs.(60)

*Stimmell, Carole A. (Toronto)*

#### CHANGES IN PREHISTORIC CERAMIC PRODUCTION TECHNOLOGY IN THE NORTH AMERICAN ARCTIC.

Environmental conditions and resource limitations make production of ceramic materials in the North American Arctic extremely difficult. Early ceramic production technology from AST sites in Alaska is compared to late prehistoric Thule pottery. Manufacturing techniques appear to have shifted away from traditional ceramic technology towards the production of water-proof vessels made of simple grit-and-fiber reinforced polymer composite cements. This type of cement and glue may have been a common element in the production of many prehistoric Eskimo materials.(50)

*Stone, Glenn Davis (Arizona)*

#### THE IMPRINT OF ONE CULTURE ON TWO LANDSCAPES.

In the past 3 decades many Kofyar households have migrated from their homeland in the hills of the Jos Plateau to a frontier area on the Benue River piedmont in central Nigeria. This movement from a landscape of rugged hills, igneous rock and dense settlement to one of low relief, sandstone-derived soils and sparser settlement has interesting implications for archaeological visibility. The homeland and frontier are compared in terms of 1) landscape modification, 2) use of domestic space, 3) architecture, and 4) selected artifacts, based on field research in both areas.(24)

*Storck, Peter L. and Peter von Bitter (Royal Ontario Museum)*

#### IMPLICATIONS OF THE GEOLOGICAL AGE AND OCCURRENCE OF FOSSIL HILL FORMATION CHERT FOR EARLY PALEO-INDIAN SETTLEMENT PATTERNS IN SOUTHERN ONTARIO.

Peoples of the Parkhill complex showed a strong preference for a distinctive "type" of white chert. Geological studies indicate that this chert is from the Fossil Hill Formation and is restricted to a limited number of outcrops in the southern Georgian Bay region. This and other evidence suggests that Parkhill complex peoples occupied a prescribed territory encompassing the southern Lake Huron and southern Georgian Bay regions. Evidence of territoriality from elsewhere in North America indicates that Early Paleo-Indian population movements were more complex than allowed by the concept of "free wandering".(46)

*Stow, S.H. (see Farquhar, R.M.)(10)*

*Straus, Lawrence G. (New Mexico)*

#### THE LAST GLACIAL MAXIMUM IN IBERIA: AN INTERREGIONAL COMPARISON.

The Last Glacial Maximum was a time of significant cultural developments in the coastal regions of the Iberian Peninsula. Cantabria, Levant and Portugal saw apparent increases in population (perhaps in part due to human abandonment of northern Europe at the height of the Upper Pleniglacial), although the high, harsh *mesetas* of central Iberia were apparently sparsely/intermittently occupied. The period of 21-17,000 BP corresponds to the Solutrean of Spain, Portugal and Southern France, which is characterized by increasingly sophisticated, complex technologies, settlement patterns and subsistence strategies. It heralds the appearance of truly "modern" hunter-gatherer adaptations in the late Upper Paleolithic, 15,000 years after the appearance of anatomically modern humans in Western Europe.(20)

*Straus, L.G. (see Heller, C.)(4)*

*Stromberg, Richard L. (Toronto)*

#### CACHE POINT (NHTs-2) AND MACKENZIE INUIT PREHISTORY.

The lower East Channel of the Mackenzie River in western Arctic Canada was the centre of a highly specialized Eskimo adaptation. Excavations at Cache Point have extended the cultural sequence back to ca. AD 1400 with three main results. First, the local cultural pattern was always focused on beluga hunting and fishing. Second, it is now clear that the Mackenzie Inuit were part of the Western Thule tradition. Third, there is evidence for phases within the Mackenzie sequence which reflect both local conditions and sustained contact with neighbouring Thule groups.(12)

*Stuiver, Minze (Washington, Seattle)*

#### A DISCUSSION OF RADIOCARBON AGE CALIBRATION.

A conventional radiocarbon age of a sample is derived from the ratio of the currently remaining radiocarbon activity to its radiocarbon activity when part of a living organism. The latter activity is estimated by assuming identical radiocarbon specific activity, after correction for isotope fractionation, for all living organisms over the entire interval for which radiocarbon dating is applicable. Thus, the correctness of a radiocarbon age not only depends on the precision and accuracy of the laboratory measurement but also on the extent to which the assumption of constancy of past radiocarbon levels is met. The importance of these factors on radiocarbon age calibration will be discussed.(23)

*Stuiver, M.(23)*

*Sussenbach, Tom and R. Barry Lewis (Illinois, Urbana)*

#### "EMERGENT MISSISSIPPIAN" AND ITS PARADIGM: THE PERSPECTIVE FROM THE CAIRO LOWLAND.

The concept of "Emergent Mississippian" requires a stage-like perspective of prehistory. We examine this concept and the extent to which it promotes the scientific understanding of the late prehistory of Eastern North America. Our reservations are illustrated with data from the Cairo Lowland and comparisons with the American Bottom and northeastern Arkansas sequences. We conclude that the scientific understanding of Mississippian societies will benefit greatly from avoiding concepts like "Emergent Mississippian" and its underlying paradigm.(10)

*Sutton, Douglas G. (Auckland)*

#### THE ORIGINS AND OPERATION OF THE NORTHERN MAORI CHIEFDOMSHIP.

Current reconstructions of northern Maori sociopolitical organization are based on nineteenth century descriptions and cross-cultural comparisons with the classic Polynesian chiefdoms. The historic descriptions post-date fundamental changes in Maori society. The comparative approach has masked the distinctiveness of pre-European Maori culture. Research in Central Northland has shown that economy there was based on geographically separated resources: inland gardens and coastal fishing. It involved the seasonal coastal-inland movement of family groups (whānau). These formed subtribal units (hapu). The size and composition of hapu oscillated over time. Leadership was based on consensus, not the authority of political office. This consensus was reached within a complex hierarchy of values in which age, gender, descent and action were pre-and/or partial determinants of rank. The tribal organization of Northern Maori society, and the large scale chiefdomship there, are recent phenomena.(55)

*Sutton, Mark Q. (California, Riverside)*

#### A REVIEW OF OPTIMAL FORAGING THEORY IN THE GREAT BASIN.

The current trend in the use of optimal foraging theory in the Great Basin is based on the use of the diet-breadth model using a single currency, energy. It is argued here that a patch-choice model,



coupled with linear programming and multiple currencies, should be applied. Included in these other currencies are cultural factors that form an important aspect of dietary choice and economic system formation.(12)

*Svoboda, Jiří (Brno)*

**THE SECOND WURMIAN PLENIGLACIAL IN CZECHOSLOVAKIA.**

1. Early Pleniglacial adaptations (28-23000 B.P.). The Pavlovian (Gravettian) of Moravia provides behavioral innovations (settlement concentration in large stations; specialization in food economy; imports of lithic materials). 2. Evolved Pleniglacial adaptations (23-20000 B.P.). The settlement centers shift from Moravia to Slovakia. Kostenkian tool-types become more frequent. 3. Pleniglacial maximum and recession (20-15000 B.P.). No evidence of settlement is proved in Czechoslovakia, but scarce occupation in S Poland could mediate contacts with E Europe. The Gravettian continues to evolve in Hungary and the Balkans. 4. Late Glacial colonisation (after 15000 B.P.). Moravia has been resettled by the Late Gravettian and Bohemia and Moravia by the Magdalenian. Cultural change from the East European-oriented Pavlovian to the Magdalenian with Franco-Cantabrian affiliation was the main consequence.(20)

*Swauger, J.(35)*

*Tainter, Joseph A. (USDA Forest Service)*

**A SKEPTICAL VIEW OF HISTORIC PRESERVATION PLANNING.**

That cultural resource management faces challenges is a fact widely known and intensely debated. Very often it is suggested that the solution to most or all CRM problems is preservation planning. Planning is thought to be a panacea for the vagaries of such diverse activities as deciding survey levels, evaluating significance, and making preservation decisions. This paper evaluates the planning approach from the perspectives of the philosophy and the sociology of science, and raises questions about the usefulness of long-range planning.(54)

*Tankersley, Kenneth B. (Indiana)*

**IN SEARCH OF EARLY PALEOINDIAN PROCUREMENT STRATEGIES IN THE MIDWESTERN UNITED STATES.**

The lithostratigraphic and geographic distribution of high quality chert resources in Indiana, Kentucky, and Ohio, have recently been identified. The petrologic composition of these chert source areas has also been identified and compared with those cherts which have been manufactured into fluted projectile points. These data are used to identify chert exploitation strategies among early Paleoindians of the Midwestern United States. A methodology for discriminating "look-alike" cherts is presented.(31)

*Tankersley, K.B. (see Vitelli, K.D.)(50)*

*Tapia, J.E. (see Moseley, M.E.)(6)*

*Taschek, Jennifer T. (Oregon, Eugene) and Joseph W. Ball (San Diego State)*

**REGAL-RITUAL RESIDENCES AND ADMINISTRATIVE HUBS: DIFFERENTIAL STRUCTURE AND FUNCTION AMONG THE MAJOR CENTERS OF THE UPPER BELIZE VALLEY.**

Recent characterizations of large-scale Classic Lowland Maya centers reflect increasing interpretive sophistication. Superseding the vacant "ceremonial center" are now the populated or vacant "organizational center," "civic center," or "major center." As yet, however, there exist few attempts to differentiate these other than by size and architectural elaborateness. Using urban anthropological concepts, two functionally and morphologically distinct major center types are identified within the same Belize Valley sociopolitical realm. These are described and their implications for overall societal organization are considered. The probable existence of yet a third functionally distinct type at nearby Naranjo is also discussed.(57)

*Taschek, J.T. (see Kelsay, R.G.)(43)*

*Taylor, R.E. (California, Riverside), P.J. Slota, Jr. (California, Riverside), W. Henning (Technical, Munich), W. Kutschera (Argonne National Lab, Illinois) and M. Paul (Hebrew, Jerusalem)*

**RADIOCALCIUM (<sup>41</sup>Ca) DATING: CURRENT STATUS AND POTENTIAL APPLICATIONS IN ARCHAEOLOGY AND PALEOANTHROPOLOGY.**

The usefulness and practical feasibility of using a long-lived ( $t_{1/2} = ca. 8 \times 10^4$  yrs) isotope of calcium (<sup>41</sup>Ca) as a means of dating bone, CaCO<sub>3</sub> in various sedimentary deposits, and other calcium-bearing materials in the age range of up to ca. one million years is currently being evaluated. The extremely low natural <sup>41</sup>Ca concentrations in terrestrial samples—recently measured in a bone sample at <sup>41</sup>Ca/low natural <sup>41</sup>Ca concentrations in terrestrial samples—recently measured in a bone sample at <sup>41</sup>Ca/Ca =  $2.0 + 0.4 \times 10^{-14}$  by a group headed by Henning, Kutschera and Paul, using the Argonne Tandem

Linac Accelerator System (ATLAS)—requires the use of Accelerator Mass Spectrometry (AMS). The current status of research on the issues and problems of sample pretreatment and preparation, evaluation of potential severity of environmental and diagenetic effects, and problems in AMS analysis will be summarized.(23)

*Teltser, Patrice A. (Washington, Seattle)*

**CHRONOLOGICAL IMPLICATIONS OF CERAMIC PASTE VARIABILITY IN MIDDLE MISSISSIPPI CERAMICS FROM SOUTHEAST MISSOURI.**

Ceramics from the County Line Settlement in southeast Missouri reveal substantial use of clay temper, (ordinarily associated with earlier Baytown ceramics), and a wider range of paste preparation than previously recognized for Middle Mississippi ceramics. Since the distribution of Baytown ceramics does not extend to this particular area, the manner in which broad shifts in ceramic temper have become embedded into many eastern U.S. chronological frameworks must be questioned. Perhaps useful as a broad scale time marker, ceramic temper is a functional dimension and unlike style, cannot be expected to vary unidirectionally through time.(50)

*Temme, Mathilde (Kentucky, Lexington)*

**CHARACTERISTICS AND INTER-REGIONAL LINKAGE OF PREHISTORIC SETTLEMENT REMAINS OF PUTUSHIO (SOUTHERN ECUADOR).**

The site, situated in the upper dry valley of Rio Jubones, was occupied for more than three thousand years with a complex settlement pattern with extensive terrace-building, water systems, remainders of houses and edifices, a large metallurgical workshop probably for gold smithing, and signs of mining activities. Remains from the late Formative and Regional Development periods are related to cultures of Pacific coast areas as well as to the wider surrounding highland region, and show a peculiar affinity to Nario cultures.(28)

*Terrell, John (Field Museum/Northwestern)*

**COMPLEMENTARY APPROACHES TO UNDERSTANDING HUMAN DIVERSITY IN THE FIJI ISLANDS.**

Variability in biology, language, and culture within the Fijian archipelago has usually been attributed to a single cause or process: the historical inheritance of particular traits (with differing amounts of hybridization) from two separate historical sources, one "Melanesian," the other "Polynesian." Research is in progress to assess the relative and undoubtedly variable weight of a number of potential contributors to human diversity in Fiji, including geography, settlement systems, demography, patterns of communication and marriage migration, as well as historical contact and intermigration with external populations.(55)

*Thomas, D.H.(38)*

*Thomas, Frank R. (Hawaii, Manoa)*

**EXPLORATIONS INTO THE LAPITA DECLINE.**

The elaboration of social complexity in West Polynesia may be linked to trading relationships of prestige items through monopoly. Such relationships were facilitated by geographic distribution of various island communities. The transformation of ceramics from common trade objects to restricted status goods took place within the framework of these trade relationships. Change and continuity in ceramic design motifs are examined within the context of similar processes observed in related design motifs in other media.(55)

*Thompson, D.(41)*

*Thompson, Marc (Calgary)*

**MESOAMERICAN ICONS AND MIMBRES MORTUARY VESSELS.**

Iconographic interpretation based on comparative analysis of repeated motifs and attribute clusters indicates painted Mimbres bowls reflect Panmesoamerican ideologies, mythic traditions and underworld conceptions. Anthropomorphic and zoomorphic Mimbres figures are demonstrably cognate with celestial bodies, culture heroes and chthonic beings known from southern, central and northern Mesoamerica. Analysis of action in narrative scenes portrayed on both Classic Maya and Classic Mimbres funerary ceramics illustrates: 1) structural relationships in mythic and metaphorical content and 2) the importance, as well as the temporal, geographical and cultural extent, of Popol Vuh imagery. The foregoing data are correlated with ethnographically recorded Pueblo mythology.(30)

*Todd, L.D. (see Rapson, D.J.)(25)*

*Tolstoy, Paul (Montréal)*

**INVESTIGATIONS IN THE BASIN OF THE RIVERS SANTIAGO AND CAYAPAS, ESMERALDAS, ECUADOR.**

A brief reconnaissance in 1983/84 suggested a fairly dense prehistoric occupation of the region, ranging in time from the Late Formative (Chorrera-equivalent) to recent (historic Cayapa). New field

work in 1986 aimed at adding substance and searching for earlier occupations now provides a refined chronology and a better understanding of subsistence and settlement.(28)

*Tomenchuk, John (Harvard)*

**DETERMINING PREHISTORIC LOADING RATES AND THEIR SIGNIFICANCE FOR FUNCTIONAL AND TECHNOLOGICAL INTERPRETATIONS.**

Certain fracture surface features on chipped stone tools and debitage can be measured in order to ascertain the instantaneous crack velocity. Patterns of variations in crack speed produced experimentally by different loading rates are usually sufficiently distinctive that it is possible to discriminate among at least three flaking technique and three in-service loading rate regimes.(56)

*Toom, Dennis L. (Colorado, Boulder)*

**THE ROLE OF PLAINS VILLAGERS IN THE POST-CONTACT MIDDLE MISSOURI TRADE SYSTEM OF THE NORTHERN PLAINS.**

The Middle Missouri fur trade was structured similarly to the central Canadian fur trade, but its operation was somewhat different. The use of permanent villages as centers of trade and the intersection of the horse and gun frontiers in the Middle Missouri subarea allowed the Arikara, Hidatsa, and Mandan to establish themselves as preeminent middleman traders during the early post-contact period. From this position the villagers effectively controlled the flow of European commodities between eastern and western nomadic groups. The pivotal role of the villagers in the trade system was lost with the establishment of local trading posts.(40)

*Topic, Theresa Lange (Trent)*

**THE LATE HORIZON IN HUAMACHUCO.**

This paper will examine the Inca occupation of the Huamachuco area in the north sierra of Peru. The paper will discuss Inca installations (administrative center and storerooms), imposed settlements related to the Inca presence (mitimae settlements), and the influence of Inca ceramics on the local tradition. In this area architecture, especially storage facilities, appears to be a better indication of the Inca presence than ceramics. Both Inca and mitimae settlement are closely related to the major roads, with less impact in more isolated areas.(41)

*Torrence, Robin (Sheffield)*

**STONE TECHNOLOGY AS RISK MANAGEMENT.**

Anthropologists exploring human strategies for coping with risk and uncertainty have overlooked the important role of tool-using for solving problems which occur on very short time scales. Variability in the nature of hunter-gatherer tool-kits as well as in patterns for the procurement of raw materials, production, repair and discard of artifacts are explained as solutions to differences in the character and severity of risk experienced. A comparison between parallel changes in the stone tool assemblages of Europe and Australia illustrates how technological and social strategies co-operate to handle different forms of risk.(9)

*Toth, Nicholas (Indiana)*

**ORGANIZATIONAL SKILLS AND EARLY STONE AGE SITES.**

The organizational patterns of modern humans and nonhuman primates are compared and contrasted with the inferred patterns of early stone age hominids. Oldowan and early Acheulean assemblages from Koobi Fora, Kenya and Peninj, Lake Natron, Tanzania are used as case studies. Criteria are proposed for assessing organizational patterns in the prehistoric record, and potential methodological problems are noted. The concepts of "expedience" and "curation" are considered, with ethnographic and primate examples.(9)

*Triggs, John R. (Toronto)*

**A QUANTITATIVE APPROACH TO THE RECONSTRUCTION OF SETTLEMENT PATTERNS IN THE TEHUACAN VALLEY, MEXICO.**

Settlement patterns within the Tehuacan Valley, Mexico, as reconstructed by MacNeish (1975), are based primarily upon site distribution, area and function. As an alternative to the qualitative identification of site function the Shannon Index is employed as a statistical measure of assemblage diversity. Presented are reconstructed settlement patterns within the Tehuacan Valley from the late Pleistocene to the Middle Formative periods. Population dynamics, as a mobile subsistence system moves towards sedentism, are discussed in light of the conceptual framework provided by Binford's (1982) model of hunter-gatherer subsistence settlement systems.(30)

*Trombold, Charles D. (Washington, St. Louis)*

**RECENT EXCAVATIONS IN THE LA QUEMADA REGION, ZACATECAS, MEXICO.**

A summary is presented of excavations of a large village site in the immediate La Quemada hinterland involving a joint project by Washington University, St. Louis and the Mexican government.

This 7-month phase was the second step in a long range plan to identify cultural occupations and affinities with outside regions, and to understand the nature of interaction between La Quemada and its more than 250 satellite sites in the Malpaso Valley. Results of this work are discussed in terms of obsidian, ceramic, faunal/floral analyses, site layout, and chronology.(30)

*Trubowitz, Neal L. (Indiana, Indianapolis)*

**NEW GOODS ON OLD ROUTES: EXCHANGE IN THE CONTACT ERA IN EASTERN NORTH AMERICA.**

As Europeans contacted native peoples, new products were incorporated into prehistoric exchange systems. The native response to European trade reflected fluctuating factors such as the nature and accessibility of European goods and ideas, and the size, social structure, and health of native populations. Comparisons of contact era archaeological sites in eastern North America suggest that subregion explanations are needed to accommodate varied diachronic exchange patterns. An example of a region specific exchange model is presented for the Caddo Indians of the Red River in Arkansas between A.D. 1500-1800.(40)

*Turner, B.L. II(42)*

*Turner, C.G. II (see Holland, K.M.)(25)*

*Upham, Steadman (New Mexico State)*

**INTERACTION AND ISOLATION: THE EMPTY SPACES IN PAN-REGIONAL POLITICAL AND ECONOMIC SYSTEMS.**

Many models of large scale political and economic systems, and especially those that emphasize locational analyses, are based on conceptions of regional connectivity that presume interactive homogeneity within and between regions. The identification of population centers that were participating in particular regional interactive networks is used as a kind of proxy currency for describing the interactive patterns of entire regions. In this paper, the "nodal" approach to interaction is examined. A single region on the southeastern periphery of the American Southwest is analyzed in relation to its links to the local Casas Grandes regional system, to larger panregional Southwestern alliance networks, and to the Mesoamerican world system.(8)

*Upham, S. (see Reed, P.J.)(24)*

*van Andel, T.H.(20)*

*Van Tilburg, Jo Anne (UCLA)*

**EASTER ISLAND MONOLITHIC STATUES AND THE SYMBOLIC DEPICTION OF RANK DIFFERENTIAL.**

Symbolic paradigms, when integrated with ecological, demographic, technological and socio-political approaches, are relevant to the interpretation of the material record, producing synthetic explanations of implied human behavior. Analysis of architectural and sculptural components of one major ceremonial site on Easter Island incorporates concepts of monumentality, successive use, directional symbolism and temporal change in the characteristics of monolithic statue type. The result of the integration of this symbolic paradigm with existing ecological, demographic and structural data is a re-evaluation of the nature of social hierarchy and a re-interpretation of the statue as symbolic of more than one aspect of that hierarchy.(55)

*Vehik, S.C. (Oklahoma)*

**LATE PREHISTORIC EXCHANGE ON THE SOUTHERN PLAINS.**

The Late Prehistoric period on the southern Plains was associated with an exchange system which moved numerous products over a wide area. The interregional trade has attracted much discussion, both descriptive and theoretical. This paper will address the seldom considered aspect of intraregional trade, especially exchange system structure, and will assess the relevance of several competing explanatory models. Also to be considered will be the nature and potential causes of post-European changes in exchange system structure.(40)

*Velichko, Andrei A. (IGAN, Moscow, USSR)*

**PALEOENVIRONMENTS ON THE RUSSIAN PLAIN AT THE VALDAI GLACIAL MAXIMUM.**

The reconstruction of Late Pleistocene environments has received a great deal of research attention in the USSR in the last twenty years. Extensive multi-team efforts have been directed to the recovery of pertinent geological, botanical, and faunal data. Information on hand today permits us to offer a detailed paleoenvironmental reconstruction of the climate and biotic resources present on the Russian Plain from 20,000 to 18,000 B.P. This paper presents these data and discusses their significance for Upper Paleolithic human adaptations.(20)

Veltre, D.W. (see Aigner, J.S.) (7)

Veltre, D.W. (see McCartney, A.P.) (7)

Vento, Frank J. (Clarion University of Pennsylvania) and Phillip T. Fitzgibbons (Pennsylvania and Pittsburgh)

#### HOLOCENE AGE PALEOSOL DEVELOPMENT AND ARCHAEOLOGICAL SITE LOCATION.

Recent archaeological and geoarchaeological investigations conducted by Vento and Fitzgibbons (1986) in northcentral Pennsylvania document a correlation between the presence of buried Late Holocene age paleosols and the occurrence of archaeological sites. The pedogenic development of paleosols on Holocene-age low terraces along levees in floodplain contexts within the Upper Susquehanna River drainage basin documents past episodes of fluvial stability during cooler-moister climatic conditions. Late Holocene hiatuses in overbank deposition allowed for relatively long term aboriginal utilization of these terrace surfaces and subsequent A-horizon development. Paleosols when encountered may serve as stratigraphic time lines. (43)

Verhaaren, Bruce T. (Chicago)

#### THE DOMESTIC USE OF SPACE AT THIRD MILLENNIUM KURBAN HYK.

Recent ethnoarchaeological investigations of Middle Eastern village households have highlighted the way in which the daily sweeping of rooms and courtyards and daily cleaning of hearths and ovens, combined with the removal of ash and debris some distance from domestic compounds, makes distinguishing use areas on the basis of artifact distribution extremely difficult. In this study, architectural features recovered from the final Bronze Age occupation of Kurban Höyük in southeastern Turkey are compared with similar features of contemporary village architecture to determine their function. These results are tested against functions suggested by the distribution of artifacts during this phase. (3)

Vermeersch, Pierre M. (Leuven, Belgium)

#### THE EARLY UPPER PALEOLITHIC IN EGYPT.

In Egypt the early Upper Paleolithic is restricted to the Nile valley. Information on this stage is still scanty but recent Belgian excavations have provided new data. The origin of the local Upper Paleolithic and its relations with the Sudanese and the Egyptian Middle Paleolithic is discussed. The early Upper Paleolithic in the northern Nile valley is mainly a mediterranean phenomenon with leptolithic techniques, whereas in the southern Nile valley Sub-Saharan influences with Levallois technological can be observed. (4)

Versaggi, Nina M. (SUNY-Binghamton)

#### DIVERSITY IN HUNTER-GATHERER SETTLEMENTS IN THE SUSQUEHANNA VALLEY OF NEW YORK.

Systematic survey of the Susquehanna Valley during planning of Interstate 88 in New York provided intra-site and regional data to address hunter-gatherer subsistence and settlement patterns. This paper focuses on one method of differentiating sites prior to regional modeling. The dimension of site size was plotted with artifact diversity and artifact cluster diversity (using Kintigh's method) to characterize sites along a simple to complex continuum. The resulting classification is interpreted within the context of forager/collector strategies. This interpretation has implications for how hunter-gatherer sites are distributed along a major river valley and an upland tributary. (34)

Vitelli, Karen D., Kenneth B. Tankersley and Nelson R. Shaffer (Indiana)

#### MORE PROBLEMS WITH ARCHAEOLOGICAL SOURCING OF ARCHAEOLOGICAL CERAMICS.

Most archaeological ceramics have a high porosity, a property which encourages absorption. It seemed possible, therefore, that, in the course of burial and chemical weathering, ceramic objects might absorb additional clay minerals and trace elements from the surrounding sediments and ground water to an extent that would distort archaeometric fingerprints of their original raw materials. Controlled experiments, using x-ray diffraction and trace element spectrochemical analyses of known material before and after simulated burial and weathering, confirm that this is the case. Archaeologists can no longer assume that the archaeometric fingerprint of a ceramic object is the fingerprint of the original raw materials. (50)

Volkman, Phillip W. (Southern Methodist)

#### PRELIMINARY EVIDENCE FOR DIACHRONIC CHANGES IN CURATION HABITS AT BOKER TACHTIT, ISRAEL.

Recent spatial distribution data from the reconstructed core artifacts at the Middle to Upper Paleolithic transitional site of Boker Tachtit (Central Negev, Israel) have provided preliminary evi-

dence for the differential curatorial treatment given some lithic artifact and tool classes. As a result, some tool class productions are spatially separated from others. These data also provide some insights into diachronic changes in curation habits, since the site's four primary context levels span a technologically transitional period. Early in the transition, the reconstructions show that cores were probably curated more often than tools. In the latter part of the transition, this pattern is reversed. These spatial patterns provide supportive intrasite data for a model of diachronic environmental adaptation and change proposed for the southern Levant. (9)

von Bitter, Peter (see Storck, P.L.) (46)

von Nagy, C. (see Ringle, W.M.) (57)

Wailes, B. (48)

Wainwright, Ian N.M. (Canadian Conservation Institute)

#### OBSERVATIONS OF THE STRUCTURE AND DETERIORATION OF ROCK ART SITES IN CANADA.

Scanning electron microscopy, x-ray analysis and x-ray diffraction examination of rock painting samples from Canada reveal cross-sectional consistency showing a discontinuous, red ochre pigment layer held between layers of amorphous, or crypto-crystalline, deposits originating from ground water seepage. These silcrete, or calcrete, layers frequently occur in parallel, rhythmic bands. They preserve rock paintings until increased thickness obscures the art and causes pigment loss. Frost weathering and lichen growth are discussed and dismissed as dating techniques. Specific examples of pictograph and petroglyph superimpositions and weathering are examined for dating and conservation research. (35)

Walden, David A. (Dept. of Communications, Ottawa)

#### THE CANADIAN CULTURAL PROPERTY EXPORT AND IMPORT ACT.

The Canadian Cultural Property Export and Import Act was passed in 1977 to better ensure the preservation in Canada of the best examples of the nation's cultural, historic and scientific heritage, and to prevent the uncontrolled export of cultural property in the national treasure category. The export of such property is controlled through regulations which define the age and value limits of categories of objects subject to control. Import controls are also included which prohibit the import into Canada of cultural property illegally exported from other countries which are signatories to the 1970 UNESCO Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property. As well, the legislation contains special tax incentives to encourage individuals to sell or donate their national treasures to Canadian institutions. (2)

Wallace, Birgitta (Environment Canada, Parks, Halifax)

#### L'ANSE AUX MEADOWS, THE FINAL OUTPOST.

Evidence indicates that the Norse occupation of L'Anse aux Meadows in northern Newfoundland took place around the last decade of the 11th century. The settlement, including up to eighty-five individuals, lasted only a few years. Its chief function was that of an overwintering camp, permitting the Norse to exploit resources in the southern Gulf of St. Lawrence. Factors limiting the Norse expansion into the New World will be considered as well as the socio-economic aspects leading to the establishment and abandonment of the site. (21)

Walthall, J.A. (see Farquhar, R.M.) (10)

Wandsnider, LuAnn (New Mexico)

#### CHIPPED STONE CODING CONSISTENCY: TESTING, RESULTS AND IMPLICATIONS.

Patterns in chipped stone assemblages inform us of the differential prehistoric use of places, but also contain information about the perceptions of the lithic analyst. The BLM Navajo-Hopi Land Exchange Archaeological Project, conducted in southcentral New Mexico, used in-field artifact analysis to rapidly recover descriptive information for some 40,000 artifacts. The field analysts, who received in-depth training to ensure coding consistency, also each coded a test assemblage of 200 chipped stone artifacts. Patterning in the results of this consistency test are discussed as are implications for the analysis of the archaeological data base. (56)

Wandsnider, L. (see Ebert, J.I.) (43)

Warrick, Gary A. (McGill)

#### ESTIMATING ONTARIO IROQUOIAN VILLAGE DURATION.

Ontario Iroquoians inhabited longhouse villages that were periodically relocated for economic reasons. Except for some ambiguous historic references, however, the length of time that any particular village was occupied is unknown. Given the importance of site duration in any construction of culture

chronology or population trends, data from both prehistoric and contact Iroquoian sites in Ontario are used to develop archaeological indices that provide the best estimate for duration of village occupation. The most useful indices considered are densities of house wall post molds and frequency of pottery vessels.(36)

*Wayman, Michael L. (Edmonton)*

**OPTICAL METALLOGRAPHY: METAL ARTIFACTS THROUGH THE LOOKING GLASS.**

When a metallic artifact can be sampled, properly prepared and examined in the optical microscope its microstructure can be quite revealing: whether it is native metal or smelted metal, and, if smelted, what was the nature of the smelting process; whether it was cast or worked, whether it was worked hot or cold and, if heated, the maximum temperature reached and cooling rate. Microstructures which result from improper sample preparation, or from corrosion, can be misleading. This presentation will illustrate some successes and pitfalls in the interpretation of microstructures of metal artifacts.(53)

*Webb, Esmée (London)*

**ENVIRONMENTAL IMPLICATIONS OF DIETARY CHANGES OBSERVED ON HOLOCENE ABORIGINAL SHELL MIDDENS IN NEW SOUTH WALES.**

Two mid-Holocene age shell middens were excavated at Merimbula, NSW. Both document a shift, between 3500 and 2500 BP, from oysters to cockles as the preferred species predated. Similar shifts in preferred shell fish collected are widely documented in Australia, but both the environmental and cultural explanations put forward for these dietary changes are controversial. It will be argued that at Merimbula, at least, the change in shellfish eaten was environmentally, not culturally, determined. The implications of this evidence for changes in local conditions will be discussed.(25)

*Webster, David (Pennsylvania State)*

**THE STUDY OF MAYA WARFARE: ITS IMPLICATIONS FOR OUR UNDERSTANDING OF THE MAYA AND FOR MAYA ARCHAEOLOGY.**

The study of warfare is particularly important because of the various forms of regional interaction: it is virtually the only one which stresses dysfunction and competition. It thus draws attention to stresses in Maya society which were difficult or impossible to resolve, and to variations inherent in Maya society which are obscured by our traditional perspective which emphasizes a monolithic view of Maya elite culture. The attitudes of several generations of Maya scholars concerning the interpretation of Maya warfare and its significance reflect fundamental shifts in the ways we think about Maya civilization.(8)

*Weigand, Phil C. (SUNY, Stony Brook)*

**CENTRAL MEXICO'S INFLUENCES IN JALISCO AND NAYARIT DURING THE CLASSIC PERIOD.**

During the Classic, Central Mexico's influences in the highland lake and river valleys of Jalisco and Nayarit were differentially expressed. In the Atemajac region, Teotihuacan style talud-tablero exteriors occur with some regularity. However, no clear-cut fine art assemblage has been recorded. West of the Atemajac Valley, such architectural influences are scarce or nonexistent. In the zone dominated by the Teuchitlan Tradition, an exotic form of circular architecture prevails. Infrequent finds of Thin Orange occur. The abrupt and well-pronounced border between Atemajac and Teuchitlan will be discussed, with reference to Teotihuacan's participation in the Mesoamerican trade structure.(11)

*Weigand, P.C. (see Harbottle, G.)(40)*

*Wells, Lisa E. (Stanford) and Jay S. Noller (Colorado, Boulder)*

**HOLOCENE RECORD OF EL NIÑO EVENTS AND EARLY AGRICULTURE IN THE RIO CASMA VALLEY, PERU.**

Holocene flood deposits preserved within fluvial terraces record 1) the recent history of El Niño events and 2) the agricultural history of the Casma Valley. A typical deposit is a 10 cm to 1 m thick sand sheet, the result of overbank flooding or debris flows. Where preserved, the sand sheets are capped by a thin (<0.5cm) silt layer, but more commonly are capped by agricultural soils. These deposits provide the potential for studying the effects of catastrophic flooding on the prehistoric agricultural development of the Casma Valley. Preliminary results suggest a minimum of 5 major El Niño events since the beginning of the ceramic and a minimum of at least 10 Pre-ceramic or earlier events.(6)

*Wells, Peter S. (Minnesota, Minneapolis)*

**TRADITION, IDENTITY, AND CHANGE BEYOND THE ROMAN FRONTIER.**

The Roman conquest of western and south-central Europe provides an excellent situation in which to examine local social changes occurring in response to a monolithic external cultural entity. Beyond

the Imperial frontier of the Rhine, the *limes*, and the Danube were a variety of Iron Age cultural groups with different economies, political structures, cultural traditions, and ethnic identities. The different kinds of social changes that took place within these groups provide instructive examples for developing models of the potential role of interregional interaction in effecting profound cultural change.(8)

*Wells, P.S.(48)*

*Wendorf, Fred (SMU), Angela E. Close (SMU) and Romuald Schild (Polish Academy of Sciences, Warsaw)*

**NORTH AFRICA DURING THE LAST GLACIAL MAXIMUM.**

The Sahara Desert was hyperarid and unpopulated at 18,000 B.P. The Nile Valley, the Maghreb, and the intervening Mediterranean coast were occupied by the makers of backed bladelet industries who belonged to the particular human type called "Mechtoids". These populations were well established shortly before 20,000 B.P., but the archaeological record immediately before then is extremely poor, and, for much of the area, blank.(20)

*Wendorf, F. (see Close, A.)(14)*

*Weniger, Gerd-C. (German Archaeological Institut, Madrid)*

**GERMANY AT 18,000 BP.**

At this time Germany is lying right between the two ice frontiers less than 1000 km apart. This bottleneck situation seems to produce such severe environmental conditions that a break in settlement history is probable. The Gravettian occupation ends about 21,000 BP although sedimentation continues in the sites, and the Magdalenian starts at 17,000 BP. Into this gap of about 3,000 years falls only one site from Northern Germany dating to 18,100 BP. The sparse finds and the singularity of the site suggest that man only sporadically entered the 'dead zone' between the glaciers during their maximum expansion.(20)

*Wenke, Robert J. (Washington, Seattle)*

**THE EPIPALEOLITHIC-NEOLITHIC TRANSITION IN EGYPT'S FAYYUM OASIS.**

The Fayyum contains Egypt's earliest and most extensive evidence of the use of domesticated cereals and animals. Yet the origins of Fayyum cultures, their settlement and subsistence systems, and the nature of the Epipaleolithic to Neolithic transition there have never been clearly established. Recent research has provided evidence regarding these issues. Differences between Epipaleolithic and Neolithic Fayyum economies are documented in terms of an analysis of the spatial distributions of faunal remains and artifacts. Fayyum agricultural origins are placed in the context of general models of agricultural origins.(14)

*Whalen, Michael E. (Tulsa)*

**SMALL COMMUNITY ORGANIZATION DURING THE LATE FORMATIVE IN OAXACA, MEXICO.**

Late Formative (ca. 300-100 B.C.) cultural systems of highland Mesoamerica have been studied mostly at the regional level and at the tops of local settlement system hierarchies. We know much less about the structure of small communities. Data from a minor Oaxacan site are used to identify two aspects of this community's internal and external organization: (1) a status-graded set of household units headed by an elite family, itself part of a valley-wide ruling stratum; and (2) workshop-level ceramic production for supra-community consumption.(30)

*Whalen, M.E. (5)*

*Whallon, R.(44)*

*Whallon, R. (see Kintigh, K.W.)(44)*

*Whallon, R. (see Kujundžić, Z.)(16)*

*White, J. Peter (Sydney, Australia)*

**ISLANDS: MIRRORS OR MIRAGES OF CONTINENTS?**

The environments of Pacific islands are, to various extents, the creations of their inhabitants. On islands close to the Pleistocene continent of Sahul, it can be shown that the current wild mammalian fauna is the result of a partial, deliberate, long-term re-creation of an original continental situation. Data from New Ireland will substantiate this. Further east, differences increase with distance from the source continent, and deliberate (if not adventitious) changes are restricted to "domestic" fauna and flora which are more directly under human control.(55)

*White, Randall (NYU)*

**PRODUCTION COMPLEXITY IN EARLY AURIGNACIAN BODY ORNAMENTATION: THE CASE OF ABRI BLANCHARD AND LA SOUQUETTE.**

Recent dissatisfaction with viewing the Middle/Upper Paleolithic transition as an all-or-nothing rubicon has led to a desire to see the Aurignacian/Gravettian as transitional in complexity between the Mousterian and the Solutrean/Magdalenian. This latter perspective is open to serious question on empirical grounds. It is clearly demonstrable in the domains of art and body ornamentation, that by 30,000 years ago complex production sequences existed for the manufacture of objects of a largely social/symbolic nature. The analysis of several hundred ivory beads and pendants, as well as engraved bone and antler objects from the prolific French Aurignacian I sites of Blanchard and La Souquette, indicates a high degree of production complexity, standardization, and conventionalization. The patterns observed are inconsistent with any notion of a simpler state of affairs in the Aurignacian than after the Glacial Maximum.(4)

*Whitecotton, J.W. (see Pailes, R.A.)(8)*

*Whitley, David S. (UCLA)*

**ETHNOGRAPHY OF COMMUNICATION AND ROCK ART STUDY IN THE ACTIVE VOICE.**

Rock art is traditionally viewed as fossilized iconographic text, with interpretation focusing on formal, stylistic or symbolic attributes of the iconography. In fact, rock art was produced by active rituals, with the ritual serving as the primary medium of prehistoric communication. Rock art images are thus secondary and passive remnants of prehistoric ceremony. Ethnography of communication provides a model for the archaeological study of the prehistoric rituals that resulted in rock art, allowing for anthropological inferences about the function and context of it. Analyses of sites from eastern California illustrate this methodological approach and the inferences that can be derived therefrom.(38)

*Whitley, D.S. (see Dorn, R.)(35)*

*Whyte, Thomas R. (Tennessee, Knoxville)*

**AN EXPERIMENTAL STUDY OF PIT FEATURE DEPOSIT FORMATION.**

Studies of archaeological pit features and their contents have been limited by a lack of understanding of deposit formation. A year-long experiment utilizing 15 artificial pits was conducted along the Tennessee River near Knoxville to observe the variable entrapment of small vertebrates and land snails in pits. Species entrapment varied according to season, temperature, rainfall, and variables of pit content and structure. Empirical data for analyzing archaeological deposit formation, site bioecology, and occupation seasonality are provided and considered in the analysis of archaeological pit features from the eastern United States.(15)

*Wiant, Michael D. (Illinois State Museum)*

**ORGANIZATIONAL VARIABILITY IN CHIPPED STONE ASSEMBLAGES, PART I: A MIDDLE WOODLAND CASE STUDY.**

An analytical framework for understanding technological responses to contextual variations is developed. Expectations for and variables of the organization character of expedient and curated assemblages are derived from the model and previous research. Two case studies (see Hassen, this symposium) are used to evaluate the validity of these relationships. This paper concerns Middle Woodland chipped-stone artifact assemblages from functionally different sites with different access to lithic resources. Both debitage and shaped artifacts are analyzed from a technological perspective. Differences in the assemblages are attributable to variations in adaptive response.(9)

*Wilcox, D.R.(26)*

*Wilkie, Duncan C. (Southeast Missouri State, Cape Girardeau)*

**RESEARCH UPDATE FROM EXCAVATIONS AT TOWOSAHGY STATE HISTORIC SITE.**

Extensive testing at Towosahgy, originally called Beckwith's Fort, has revealed some interesting information about the association between this large Mississippian Period, temple mound site (ca. A.D. 1000) and a nearby hamlet in the state park. Recent test excavations just outside the southern fortification line supply insight for reconstructing the environmental setting on the periphery of this temple mound center and the existence of a small hamlet. The tentative association of the Mississippian temple mound center to a hamlet just outside its walls gives new insights for settlement pattern analysis on Pinhook Ridge in Southeast Missouri. The Mississippian expression in this area may have had antecedents from an in situ Late Woodland base, which is especially noticeable in the southern half of Towosahgy.(10)

*Williamson, Ray A. (OTA, U.S. Congress)*

**ARCHAEOLOGY, TECHNOLOGY, AND PUBLIC POLICY.**

The efficient use of techniques, equipment, and methods is critical to cost effective management of our cultural resources. If advanced technologies are to assume a greater role in archaeology, it is crucial to find more effective means of transferring technology developed in other fields to archaeology and historic preservation. A federally-funded national Center for Preservation Technology could coordinate research, disseminate information, and provide training about new technologies. This paper discusses options for such a center and presents other major findings of OTA's recent report on *Technologies for Prehistoric and Historic Preservation*.(54)

*Williamson, Ronald E. (Archaeological Services Inc.)*

**EARLY IROQUOIAN: PEOPLE IN TRANSITION.**

Recent archaeological surveys and excavations in southern Ontario, conducted within a regional settlement framework that allows for the examination of functional variability in the use of sites, demonstrate that Early Iroquoians had mixed economies involving both horticulture and a considerable reliance on naturally-occurring subsistence resources. Their settlement-subsistence strategies can therefore be seen to differ significantly from those documented for either earlier hunter-gatherers or Late Iroquoians. This suggests that the economic and socio-political organization of Iroquoian society developed over a much longer period than was previously thought.(33)

*Wilson, A.T. (see Long, A.)(23)*

*Wilson, Samuel M. (Chicago)*

**RECENT RESEARCH ON NEVIS, WEST INDIES.**

This paper reports the results of three seasons of archaeological research on Nevis, a 36 square mile volcanic island in the Leeward arc of the Lesser Antilles. Emphasis is placed on relating changes in ceramics and settlement distributions with changes in the faunal representation in sites spanning a 3000-year period. The correlation of the Nevis material with other islands, and the implications of this research for Caribbean prehistory, generally are discussed.(37)

*Wilson Yang, K.M., J.E. Smeaton, K.M. Matsui, L. Bond and G. Burns (Toronto)*

**ARCHAEOLOGICAL SITES AS CHEMICAL SYSTEMS.**

The consideration of archaeological sites as definable chemical systems extends the practice of archaeometry from that of the investigation of objects in isolation. Studies at ancient Egyptian sites will be used to illustrate how computational, analytical and physical techniques can be used to investigate ongoing physico-chemical processes. The information obtained from this approach to the study of ancient materials is of immediate interest to archaeological conservation and pure and applied sciences.(43)

*Wiseman, Fred (MIT)*

**ARCHAEOLOGICAL POLLEN ANALYSIS.**

Archaeological pollen analysis takes two forms. The first, almost identical to standard paleoecological palynology, uses long cores from lake sediments to reconstruct regional climates, vegetation patterns, and people-environmental relations. The second is the hand-maiden of archaeology and samples sediments from sites to understand small scale problems such as use areas or food processing. Both methods have much to contribute to archaeology. This workshop will compare and contrast these two methods to show how they can yield complimentary insights into the human past.(53)

*Wiseman, E.M. (see Herlihy, P.H.)(42)*

*Withrow, Randall M. (Minnesota, Minneapolis)*

**ASPECTS OF MEANING IN EASTERN DAKOTA MORTUARY PRACTICES: AN INVESTIGATION USING ETHNOHISTORIC AND ARCHAEOLOGICAL DATA.**

Archaeological and ethnohistoric evidence concerning Eastern Dakota mortuary practices is presented for the period A.D. 800 - 1862. Significant changes are noted in several aspects of practice during the period of Euro-American contact, including an increasing use of material associations and use of coffins. In contrast, a persistent pattern of post-mortem treatment is noted, characterized by placement of the dead on aerial platforms with subsequent interment in earthen mounds. A symbolic contrast of "interment" above-ground and below-ground is suggested and linked to a set of conceptual principles manifested in contrasting notions of spirit/body and sky/earth.(60)

Witschey, W. (see Ringle, W.M.) (57)

Wobst, H.M. (20)

Wojtala, James (Western Michigan) and Shaune M. Skinner (Archaeological Services Consultants, Inc.)

#### ARCHAEOLOGY IN SOUTHEAST OHIO: RECENT CHANGES IN THE DATA BASE.

Ebb and flow of interest, changing political, economic and social concerns and the polemics of significance have in the past affected how the identification of sites has been undertaken in south-eastern Ohio. Most recently, the rate at which the surveys are conducted has been increased by the strengthening impetus of the Ohio Historic Preservation Office. This has resulted in an expansion of information for this region. Specific comparisons documenting this increase in data base by county are provided, and examples of how this has affected historical reconstruction efforts are given. The potential for this program is then reviewed and possible future results are highlighted. (18)

Wolf, Cornelia A. (Chicago)

#### ANALYSIS OF FAUNAL REMAINS FROM UPPER PALEOLITHIC SITES IN THE LEVANT.

This paper examines patterns of faunal exploitation in the Levant during the Upper Paleolithic (>40,000 to ca. 20,000 B.P.). The methodological focus is on the construction of age profiles derived from the crown height measurements of several prey species from a group of Levantine Upper Paleolithic sites (including Hayonim, Kehara, and Ksar Akil). These are compared with age profiles from earlier, Mousterian and later, Epipaleolithic levels in order to shed light on the nature and extent of changes in adaptive strategies in the Levant during the Upper Pleistocene. (4)

Wolyne, Renata B. (Edinboro)

#### GREAT EXPECTATIONS: A CRITICAL EVALUATION OF THE CULTURAL RESOURCE OVERVIEW OF THE ALLEGHENY NATIONAL FOREST.

The Allegheny National Forest cultural resource overview represents an early effort, on the part of the Forest Service, to develop an aggressive management plan for the forest. The overview includes a substantial inventory of known and possible historic and prehistoric sites; a predictive model using, for the times (1978), innovative computer mapping techniques; and recommendations for public education, protection, further research, etc. This paper critically evaluates the research effort itself, discusses problems encountered, and attempts to determine if the resulting overview document was useful and, indeed, if it was worth doing. (54)

Woods, W.I. (see Collins, J.M.) (10)

Woosley, Anne I. (Amerind Foundation)

#### AGRICULTURAL COMPETITION AND COOPERATION ON THE TAOS PLATEAU.

Prehistoric and Spanish settlements on the Taos Plateau shared similar geographic distributions suggesting that both were competing for the same set of critical resources. Although the Spanish population expanded at the expense of Indian territory, traditional agricultural techniques were adapted and shared by colonists. Examination of the resulting settlement system and associated agricultural complex indicates the strategies required to be a successful farmer in the far northern Rio Grande, and offers insights into the interaction of two disparate cultural traditions during the Proto- and early historic periods. (26)

Wright, H.T. III (46)

Wurst, L. (see Clark, L.) (29)

Wurtzburg, S. (see Jackson, L.) (22)

Yates, Royden J., Anthony M. Manhire and John Parkington (Capetown)

#### ETHNOGRAPHY, ARCHAEOLOGY AND ROCK ENGRAVINGS IN THE WESTERN CAPE, SOUTHERN AFRICA.

Southern Africa is fortunate in having several professional ethnographies from the Kalahari, valuable historic accounts of indigenous peoples, and a well preserved archaeological record which includes rock paintings and engravings. Lewis-Williams has cogently argued for a pan-San cognitive system in southern Africa which informs myth and ritual, as well as the imagery of rock 'art'. In this paper we investigate the geography of the San concepts of game control, healing and shamanism in relation to the rock painting imagery of the western Cape. (38)

Yellen, John E. (National Science Foundation)

#### THE EFFECT OF NON-HUMAN PREDATORS ON INTRA-SITE SPATIAL ORGANIZATION.

The spacing of household units in Australian Western Desert Aborigine campsites is significantly greater than in their !Kung San counterparts. This paper examines variables which affect inter-

household distances in a series of "traditional" societies. While factors such as the degree of sharing clearly affect spacing, it is argued that the presence or absence of non-human mammalian predators plays an important role. The wider implications of this fact are considered. (44)

Yesner, David R. (Southern Maine)

#### MOOSE HUNTERS OF THE BOREAL FOREST? A REEXAMINATION OF BOREAL FOREST SUBSISTENCE PATTERNS.

Classical subsistence patterns for the boreal forest have focused on moose, and to some extent caribou, as the large game animals that provided efficient sources of meat, skins, and other materials. Moose hunting plays an important role in models of boreal forest social organization, and ethnoarchaeological studies have projected such models into the past. Ethnohistoric, ecological, paleoecological, and faunal data all suggest that moose did not move into subarctic areas until the last few hundred years; thus moose hunting is a relatively recent phenomenon. Data from sites on Alaska's Kenai Peninsula suggest some alternative models for the organization of boreal forest hunters. (59)

Zeder, M.A. (Smithsonian)

#### SUBSISTENCE AND IDEOLOGY IN COASTAL ECUADOR.

Faunal remains from the Jambelli period (500 B.C.) cemetery of San Lorenzo, coastal Ecuador, are used to examine the evolution of local subsistence economy and its impact on regional ideological values. Dietary remains from human burial matrices evidence the nature of animal procurement during a period of increasing reliance on maize. The use of dogs as offerings conveys information on social organization and local cosmology. Contrasted with the neighboring cemetery at Ayala (710 - 1200 A.D.), it is possible to bracket the period during which domestic species, including camelids, were introduced and became increasingly important components in both the subsistence and ideology of coastal Ecuador. The impact of expanding Andean states on cultural developments in these more marginal areas is discussed. (17)

Zeidler, James A. (Pittsburgh)

#### FELINE MORTARS IN ANDEAN RITUAL: NEW EVIDENCE FROM MANABI PROVINCE, ECUADOR.

This paper sheds new light on the origins and development of the so-called "cult of the feline" in the northern Andean area by considering one of its basic items of ritual paraphernalia: the feline-effigy mortar of ground or polished stone. After a brief review of the existing archaeological evidence of these mortars and a discussion of their probable ritual use in the preparation and consumption of hallucinogenic substances, new evidence is presented which demonstrates their presence in a Terminal Valdivia (Phase VIII) context at the rich, multicomponent site of San Isidro, northern Manabi Province, Ecuador, where they are found in association with faunal remains identified as jaguar (*Felis onca*) or puma (*Felis concolor*). The implications of this discovery are then evaluated with reference to the antiquity and development of tropical forest/highland interaction spheres in the pre-Chavin time period of the northern Andean Area. (13)

Zeidler, J.A. (see Stahl, P.W.) (34)

Zeitlin, Judith Francis (Brandeis)

#### BEYOND THE SHADOW OF MONTE ALBAN: CLASSIC PERIOD AFFILIATIONS IN THE COASTAL LOWLANDS.

Rather than retreating into purely localized concerns following the territorial retrenchment of Monte Alban during the Classic period, the southern isthmus of Tehuantepec and other coastal areas of Oaxaca appear to have asserted interregional ties through a loosely structured cultural and economic network encompassing what Lee Parsons designated the "peripheral Coastal Lowlands." Using excavation data from the isthmus as a base, this paper offers a preliminary consideration of the stylistic components of the perceived lowland Middle Classic horizon, the horizon's Oaxaca distribution and its potential significance for assessing the importance of El Tajin in the political structure of pre-Hispanic Mesoamerica. (5)

Zeitlin, Robert N. (Brandeis)

#### THE ISTHMUS AND THE VALLEY OF OAXACA: QUESTIONS ABOUT MONTE ALBAN IMPERIALISM IN THE PACIFIC LOWLANDS.

Mounting evidence depicts the early Zapotec state at Monte Alban as a conquest-bent economic predator. Fired by a demand for non-local goods, this imperialism is currently thought to have been confined mainly to surrounding highland regions. But there are suggestions that the Zapotec realm extended to the southern Isthmus of Tehuantepec where an exchange system that for centuries supplied Oaxaca Valley elites with desired coastal lowland commodities may have been replaced by

Monte Alban with a system of procurement founded upon political subjugation. Should proposed investigations lend further support to this hypothesis, the Late Preclassic frontier of the Zapotec empire will need to be redrawn considerably beyond its presently estimated bounds.(5)

Zhang, Z. (see Jopling, A.V.)(15)

Zier, Christian J. (Centennial Archaeology, Inc.)

**RESIDENTIAL AGRICULTURE IN A POST-ERUPTION ENVIRONMENT, EL SALVADOR.**

The Ceren site is a non-elite residence occupied in the late 6th century A.D., approximately 300 years after a catastrophic volcanic eruption. Portions of two fields exposed by excavation indicate that maize agriculture was being practiced in a nutrient-poor soil developing in light-colored silicic tephra. Coring of unexcavated areas indicates house spacing of 100 meters, with intermediate fields or garden plots. The demographic implications of resettlement by agriculturalists on such a poorly developed volcanic soil are explored, as is the probable composition of the overall agricultural system of which the Ceren fields are a part.(42)

Zilhão, João (Lisboa, Portugal)

**THE EARLY UPPER PALEOLITHIC OF PORTUGAL.**

Evidence for pre-solutrean assemblages in Portugal is reviewed, with particular emphasis on the Rio Maior area, where extensive but never published field work was carried out between 1935 and 1952 by the National Museum of Archaeology's former director, Manuel Heleno. Conclusions are that only one assemblage can be positively identified as Aurignacian and another as possibly Gravettian or 'gravettoid'. Possible explanations for this scarcity as opposed to the richness of the known occupation of central Portugal in solutrean and magdalenian times are discussed.(4)

Zilhão, J. (see Gamble, C.)(20)

## ABSTRACTS OF POSTERS

Ahlstrom, Richard (Arizona Archaeological and Historical Society)

**"CASUAL" REPEAT PHOTOGRAPHY AND HOPI ARCHITECTURE.**

Since the 1880s, one response of the Hopi Indians of Arizona to Anglo-American society has been to change their built environment—including materials, styles, arrangement of roofed space, village layout, and settlement pattern. Walpi Pueblo, for example, has been transformed from settlement to ceremonial site and historical monument. Photographs, maps, and a scale model provide a visual record of architectural change in the First Mesa community, particularly Walpi. Between 1880 and 1940, "casual" repeat photography produced over 200 images of Walpi, which are sequenced by means of a Harris Matrix. Tree-ring dates contribute to dating of architectural change.

Colburn, Mona L. (Illinois State Museum, Springfield)

**SUBSISTENCE REMAINS FROM A MISSISSIPPIAN PERIOD SITE IN ILLINOIS.**

Faunal remains from the 900 year old Lundy site in northwestern Illinois are analyzed in order to assess subsistence practices, seasonality, and habitat utilization. Preliminary findings indicate that a broad range of animal resources were procured from the Apple River and associated backwaters, open woods, and forest-edge. Deer and fish remains predominate in the assemblage. Species diversity, seasonality indicators, and suspected debris density suggest that the site was occupied year-round as a small village, hamlet, or major base camp.

Czaplicki, J.S. (see Ravesloot, J.C.)

Davis, J.O. (see Durand, S.R.)

Doroszenko, Dena (Toronto)

**URBAN ARCHAEOLOGY ON THE UNIVERSITY OF TORONTO CAMPUS.**

During 1985 and 1986, salvage excavations on the Southwest campus of the University of Toronto concentrated on determining the presence of structural and/or cultural features related to the pre-urban landscape of this area, as well as late nineteenth century urban rear yards. The project emphasized examining residential patterns and consumer behavior in this area and how they changed during the nineteenth century.

Durand, Stephen R. and Johathan O. Davis (Desert Research Institute)

**DIRECT VIDEO INPUT OF ARCHAEOLOGICAL DATA.**

Much primary archaeological data is visual. The automated direct input of this data serves two complementary purposes. First, the acquisition of data, already part of archaeological analysis, can be accomplished more efficiently and accurately using inexpensive microcomputers and video technology. Second, digital imagery allows new forms of analysis that increase our ability to understand and explain the past. We demonstrate acquisition, measuring of distance and angles, and enhancement of microscopic and macroscopic images of archaeological subjects.

Ford, D.L. (see Hester, J.J.)

Hester, James J. (US Army Corps of Engineers, Waterways Experiment Station), Robert M. Thorne (Mississippi) and David L. Ford (US Army Corps of Engineers, Waterways Experiment Station)

**ARCHAEOLOGICAL SITE PRESERVATION IN SITU: MITIGATION WITHOUT EXCAVATION**

Archaeological site preservation in situ is a rapidly developing field. Nationwide, sites are subject to a multitude of impacts including streambank erosion, wind deflation, groundwater leaching, compaction, plowing, chemical contamination, animal burrowing, vehicular traffic, and vandalism. Research in progress is focused on the development of suitable technologies for preservation and evaluation of their effectiveness over time. Techniques being studied include site burial, installation of protective structures, fences, and signs; soil stabilization, revegetation, site camouflage, remote sensing of erosion rates and incursions by vandals, faunal control and the impact of these control measures on site components. Results of ongoing research will be presented by means of a videotape.

McGowan, Kevin P. (Illinois, Urbana)

**LATE WOODLAND SETTLEMENT PATTERNS AROUND LAKE SHELBYVILLE IN EAST CENTRAL ILLINOIS.**

Survey data from the environs surrounding Lake Shelbyville in East Central Illinois are examined for correlations between physiographic variables and site locations. Special emphasis is placed on sites attributable to the Late Woodland Period (AD 400 - 1000) to allow examination of the effects of maize introduction on local settlement patterns. Maize is reported to date to the early part of the

period, in limited amounts, with more extensive finds near the end of the period. Computer generated graphics are provided to illustrate the results of this settlement pattern study.

*Oliver, Sheryl G. and Robert E. Warren (Illinois State Museum)*

**PREDICTIVE MODELING OF ARCHAEOLOGICAL SITE LOCATION: A COMPARISON OF TWO CONTRASTING UPLAND ENVIRONMENTS IN THE MIDWEST.**

Because the settlement decisions of prehistoric societies were conditioned, to some extent, by the natural environment, it is possible to develop models of archaeological site location by analyzing the environmental context of known sites. Using ARC/INFO, a geographic information system, a series of environmental variables are derived from source maps. Based on these variables, a stepwise logistic regression produces and tests predictive algorithms. Our exhibit compares the results of probability-based predictive models for two contrasting upland areas in the Midwest, with: (1) a graphic display of statistical procedures, (2) computer generated illustrations of selected environmental variables, and (3) computer generated contour maps showing site-presence probabilities.

*Parry, William J. and E.E. Smiley (Southern Illinois)*

**EARLY AGRICULTURE IN THE NORTHERN SOUTHWEST: A PROGRESS REPORT ON THREE FIR SHELTER, ARIZONA.**

Three Fir Shelter is a large Basketmaker II (ca. 550 B.C. to A.D. 250) habitation site near the northern escarpment of Black Mesa, Arizona. Excavation of 10% of the sheltered area exposed one small structure, over 20 storage features (pits and cists), 7 thermal features, and a large slab-lined roasting pit. Fragments of perishable artifacts and subsistence remains were abundant, including a large sample of maize and cucurbits. The recovered remains provide important new data on the earliest agricultural adaptation in the Kayenta region. This presentation provides a visual update on the results of excavations and analysis.

*Ravesloot, John C. and Jon S. Czaplicki (ASM, Tucson)*

**THE TUCSON AQUEDUCT PHASE B PROJECT: NEW DATA ON THE TUCSON BASIN HOHOKAM.**

Excavation at 15 sites in the Avra Valley west of Tucson, Arizona, provided new information on non-riverine Hohokam adaptation. Excavation focused on a Snaketown phase (A.D. 300-500) and two Rillito phase (A.D. 700-900) sites. Because so few sites from these time periods have been excavated, our research emphasized evaluating a poorly defined chronology, in addition to examining site organization, exchange, and subsistence.

*Rogers, Anne Frazer (Western Carolina)*

**UPLAND SITES AND TOPOGRAPHY IN THE SOUTHERN APPALACHIANS.**

Recent surveys of high altitude sections of the Southern Appalachians have resulted in the identification of a number of archaeological sites. These represent different temporal periods as well as various activities. Analysis of the distribution of these sites has provided the basis for a predictive model related to physiographic features. Factors which affect location of these upland sites are identifiable through examination of topographic details and assessment of nearby resources. This presentation provides a graphic interpretation of specific situations in which sites are most often found.

*Scherberger, Duncan J. (Toronto Board of Education)*

**THE ARCHAEOLOGICAL RESOURCE CENTRE.**

The Archaeological Resource Centre is the first facility within a North American school system established for the purpose of offering hands-on programmes in archaeology to both students and interested members of the general public. This combined educational and research institution explores Toronto's heritage through a six-month excavation including a summer Grade 11 and 12 credited Archaeological Field School in which students play the most significant role. Winter classes for students, night school courses for adults and volunteer opportunities make the Archaeological Resource Centre a year-round educational experience.

*Smiley, E.E. (see Parry, W.J.)*

*Stout, Charles B. (Illinois, Urbana-Champaign)*

**INTRASITE RELATIONSHIPS AT A MISSISSIPPIAN TOWN.**

Intra-community relationships of an archaeological chiefdom-level society can be studied through distributional and formal analyses of controlled surface collections from large, complex sites. A western Kentucky Mississippian center comprised of a mound group and surrounding habitation area serves as a case study. Spatial, functional and typological analyses of artifacts recovered in a 100%

controlled surface collection at this site are used to locate and identify activity areas, determine cultural and functional relationships between these areas, assess the extent and bases of community segmentation, and delineate patterns of site growth and maintenance.

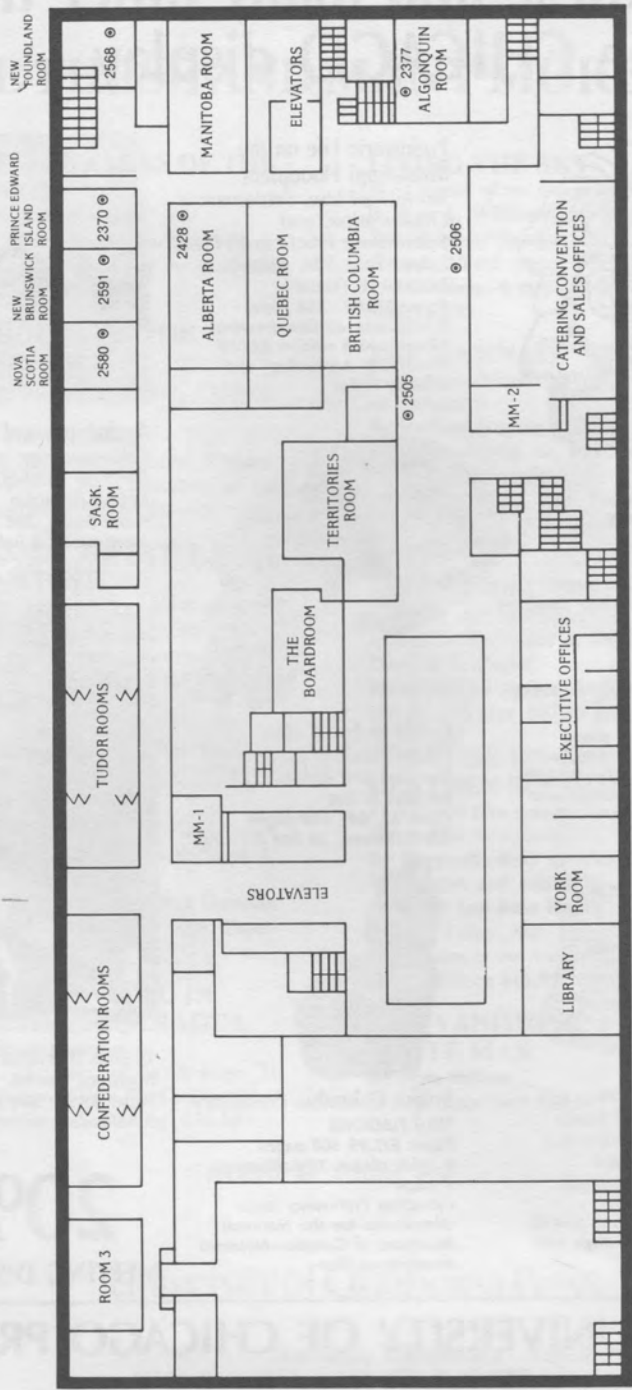
*Thorne, R.M. (see Hester, J.J.)*

*Warren, R.E. (see Oliver, S.G.)*

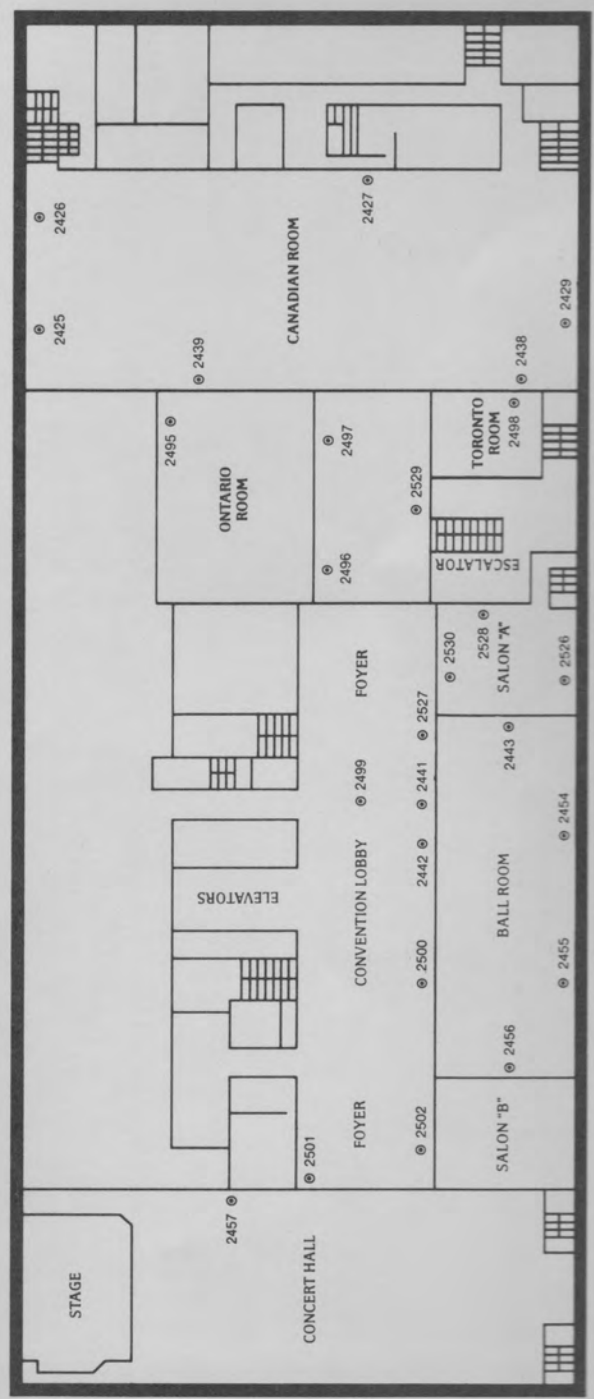


## INDEX TO EXHIBITORS

- Tables 14, 15 & 16 Academic Press Inc  
Orlando Fl 32887  
Books and journals relating to archaeology will be displayed.
- Tables 1 & 2 Association of American University Presses  
One Park Av  
New York NY 10016  
Scholarly books in a wide range of disciplines published by university presses from all regions of the US, Canada, and abroad presented in a cooperative exhibit by the members of the Association of American University Presses.
- Tables 5, 6, & 7 Cambridge University Press  
32 E 57th St  
New York NY 10022  
Academic books and journals
- Table 24 Center for the Study of Early Man  
495 College Av  
Orono ME 04473  
Books and periodicals of the Peopling of the Americas publication program, and the Center's Pleisto-Scenes Merchandise.
- Table 22 Fromm Applied Technology  
13129 N Greenbay Rd  
Mequon WI 53092  
The exhibit will have photos, technical notes, and video tapes demonstrating the use of geophysics in archaeology.
- Table 23 Historic Preservation Program  
University of Nevada-Reno  
Reno NV 89557  
The Historic Preservation Program will be displaying materials (brochures, etc.) advertising and promoting its newly formed and ongoing Continuing Education Program in Cultural Resource Management designed primarily for CRM professionals.
- Table 11 Plenum Publishing Corporation  
233 Spring St  
New York NY 10013  
Featuring, JOURNAL OF WORLD PREHISTORY, edited by Wendorf/Close; the Interdisciplinary Contributions to Archaeology series (Jochim); Soffer—THE PLEISTOCENE OLD WORLD; and Spencer-Wood—CONSUMER CHOICE IN HISTORICAL ARCHAEOLOGY.
- Table 18 Quantitative Systems  
PO Box 509  
Fayetteville AR 72702  
MINARK Microcomputer DBMS QMS Mapping System (brochures and computer demonstration).
- Table 26 Royal Ontario Museum  
100 Queen's Park  
Toronto Canada M5S 2C6  
ROM archaeology publications
- Table 17 Smithsonian Institution Press  
955 L'Enfant Plaza #2100  
Washington DC 20560  
Scholarly books in the fields of archaeology and anthropology
- Table 19 Thames and Hudson Inc  
500 Fifth Av  
New York NY 10110  
Books
- Table 25 The UCLA Institute of Archaeology  
The University of California, Los Angeles  
Los Angeles CA 90024  
Publications of Archaeological Site reports, Symposia papers, scholarly works covering the Old, the New World and Asia.
- Table 8 University of Arizona Press  
1615 E Speedway  
Tucson AZ 85719  
Books
- Tables 9 & 10 The University of Chicago Press  
5801 S Ellis Av  
Chicago IL 60637  
Scholarly books and journals including the prehistoric archaeology, and ecology series.
- Tables 20 & 21 University of New Mexico Press  
Albuquerque NM 87131  
Books
- Tables 3 & 4 University of Oklahoma Press  
1005 Asp Av  
Norman OK 73019  
Quality scholarly books pertaining to American archaeology and related fields of interest.
- Tables 12 & 13 University of Texas Press  
PO Box 7819  
Austin TX 78713  
We will be displaying our books on archaeology and related subjects will be displayed.



**Main Mezzanine**



**Convention Floor**

**Directory of Meeting Rooms  
The Royal York Hotel**

**MAIN MEZZANINE**

Library  
Manitoba  
New Brunswick  
Newfoundland

Nova Scotia  
Prince Edward Island  
Quebec  
Saskatchewan

Territories  
Tudor

**CONVENTION FLOOR**

Ballroom  
Canadian  
Toronto

Alberta  
Algonquin  
British Columbia  
Confederation